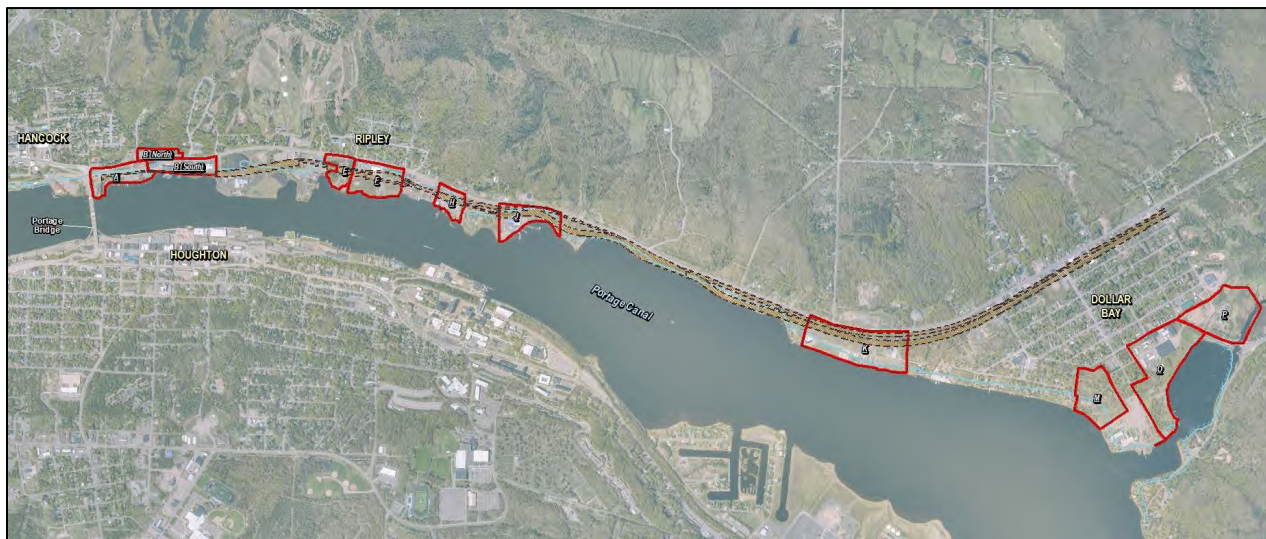


# SITE INVESTIGATION REPORT

ABANDONED MINING WASTES – TORCH LAKE NON-SUPERFUND SITE  
QUINCY MINING COMPANY PORTAGE OPERATIONS AREA  
HOUGHTON COUNTY, MICHIGAN  
SITE ID# 31000098



APRIL 2024

PREPARED FOR:



**MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY**  
REMEDIATION AND REDEVELOPMENT DIVISION  
CALUMET FIELD OFFICE



## EXECUTIVE SUMMARY

The Mannik & Smith Group, Inc. (MSG) has prepared this Site Investigation (SI) Report as part of the Abandoned Mining Wastes – Torch Lake non-Superfund Site (Project) [EGLE Abandoned Mining Waste](#) (Site ID: 31000098). This report summarizes Michigan Department of Environment, Great Lakes, and Energy (EGLE) investigations completed in the Quincy Mining Company Portage Operations Area (QMCP), Houghton County, Michigan. The SI was prepared in accordance with the *Indefinite Scope Indefinite Delivery (ISID) Discretionary Proposal for FS and Remedial Action Activities* (24 February 2016) as amended, prepared by MSG in response to a request from the EGLE, Remediation and Redevelopment Division (RRD), Calumet Field Office under MSG's 2015 Environmental Services ISID Contract Number 00538 with the State of Michigan.

The Project was characterized by the risks posed by chemical containers and residues historically discarded in or near Torch Lake and along the north shoreline of the Portage Canal. These concerns are distinct and separate from the risks historically addressed under the U.S. Environmental Protection Agency's (EPA's) Superfund program. The RRD Superfund Section (SFS) has stated that the EPA defines the Torch Lake Superfund Site as the upper six inches (in.) of stamp sand and slag in certain areas of Houghton County and any soil cap and vegetative cover applied to such areas.

The remaining concerns at Torch Lake, the Portage Canal, and the surrounding areas identified by EGLE included known or suspected impacts to groundwater, surface water, sediments, and upland media that were not addressed under the Superfund program. Environmental impacts that were evaluated as part of the SI were assessed under the guidance of the following objectives:

- Investigate and document unidentified, significant in-lake and/or terrestrial sources of contamination including polychlorinated biphenyls (PCBs);
- Investigate and document bulk disposal areas, including made lands, stamp sand deposits, slag dumps, and landfills; and,
- Investigate and document industrial ruins including coal storage areas, underground storage tanks (USTs), asbestos containing materials (ACM), residual process materials (RPM), and any other waste materials identified during investigations.

Environmental impairments within Torch Lake and along the shorelines from Lake Linden to the Portage Lake Lift Bridge resulting from historical mining era industrial operations:

- Present potential exposure risk to human and ecological receptors;
- Limit the recovery of the Torch Lake and Portage Canal ecosystems;
- Create uncertainty over safe and beneficial reuse of the land; and,
- Delay delisting of Torch Lake as an Area of Concern (AOC) under the Great Lakes Water Quality Agreement due to Beneficial Use Impairments (BUIs) related to restrictions on fish and wildlife consumption because of the on-going presence of PCBs and mercury in fish and degradation of benthos because of metals contaminated sediments.

As such, the investigation was largely driven by documented observations of abandoned containers and/or other waste and debris locations in water bodies and in upland areas, supported by documented historic operations.

Taking into account the specific objectives outlined above, the principal goal of this portion of the Project was to support a comprehensive management approach to guide EGLE's decision making process in addressing potential human health and environmental risks present in the QMCP. The primary focus of the Project was to ascertain the source, nature, and extent of contaminants (including PCBs) in all affected environmental media (soil, groundwater, surface

water, and sediments) within the Project study area, including the QMCP that consists of the former mining era industrial areas from the Portage Lake Lift Bridge in Hancock to Dollar Bay along the north shoreline of the Portage Canal. Refer to **Figure 1-1, Project Location Map**. Due to the varying nature of historical operations within the QMCP, subareas addressed as part of this SI work were as follows:

- Area A;
- Area B;
- Area E;
- Area F;
- Area H;
- Area J;
- Area K
- Area M;
- Area O; and,
- Area P.

The locations of the listed subareas are depicted on **Figure 1-2, Area Features Map**.

This SI Report assimilates information from multiple data sources into a logical and thorough narrative focused on the north side of the Portage Canal from the Portage Lake Lift Bridge to Dollar Bay. This area, defined in the document as the QMCP, encompasses the former Quincy Mining Company (QMC) copper mining and processing operations and includes certain mining era industrial facilities in Dollar Bay and on the Ripley Waterfront along the Portage Canal. The findings presented herein were developed using the conclusions derived from historical operations research, investigation and response activities, and the investigation of data gaps or known or suspected impacts to groundwater, surface water, sediments, and upland media in and around the north side of the Portage Canal.

Due to the sizeable nature of the QMCP, this SI Report has been organized to present organizational and procedural steps that were common to the investigation in the first four sections of the document. Following these discussions that are broadly applicable to the Project as a whole, the SI Report transitions to a presentation of detailed findings specific to a subset of the upland and in-lake subareas within the QMCP. Remaining subareas addressed as part of the Project within the QMCP footprint are discussed in other SI reports. The SI Report then closes with a comprehensive summary of conclusions and recommendations. The following provides a brief overview of the SI Report's organization.

**Section 1** of this SI Report defines the overall objectives and the organizational structure of the Project. **Section 2** provides Project background information and its significance as it relates to each of the study areas included in the QMCP. **Section 3** provides a summary of the stepwise approach used to evaluate historical operational and analytical data, and its incorporation into the field procedures and sample collection activities prescribed in the Sampling and Analysis Plan (SAP) for the Project. **Section 4** includes a summary of the relevant exposure criteria and pathways used to evaluate the analytical findings from the investigation. **Section 5** through **Section 15** provide detailed findings including figures and tables summarizing analytical results for the QMCP. **Section 16** includes a summary of conclusions and recommendations. **Section 17** includes references utilized in the development of this SI Report.

The submittal of the QMCP SI Report marks a significant milestone in the assessment and remediation of environmental impairments within the Portage Canal and industrial areas along the shoreline caused by historical mining and industrial operations not addressed under the EPA Superfund Program.

Environmental impacts in the QMCP are generally characterized by detections of organic and inorganic contaminants in soil, sediment, groundwater, and pore water; repercussions of mining era operations in the region. The following

provides a summary of findings derived from the assessment of the QMCP with respect to the goals and objectives for the Project relative to the EGLE criteria at the time of Project completion:

- Terrestrial sources of contamination are present in the form of inorganic chemicals of concern (COCs), semi-volatile organic compounds (SVOCs), volatile organic compounds (VOCs), and cyanide in the study area;
- In-lake sources of contamination are present in the form of inorganic COCs and SVOCs in the study area sediments and some areas of pore water. The detection of SVOCs in at least certain locations may be indicative of terrestrial source areas;
- No in-lake or terrestrial uncharacterized waste deposits were identified in the study area;
- PCBs were only detected at one location (in Area J) and no samples analyzed for PCBs exceeded EGLE criteria in the study area;
- ACM was not identified in the study area; and,
- Industrial ruins, including foundations and building floors associated with mill ruins are present. Uneven terrain, structure remnants, and metal debris pose a potential physical hazard due to slip, trip, and fall concerns.

The Project provided a comprehensive evaluation of the terrestrial and Portage Canal portions of the QMCP study area. By copy of this SI report, the Project findings have been provided to the other governmental stakeholders responsible for implementation and monitoring EPA's remedy for the Torch Lake Superfund Site so they can determine if any remedy modifications are necessary in the Portage Canal or terrestrial areas previously addressed by EPA in light of the additional information provided by the Project. The stakeholders include various EPA programs, health agencies, other EGLE divisions, property owners, and other governmental entities.

Next steps specific to QMCP include:

- Owners of property that was previously used for industrial or waste disposal purposes in the study area should become familiar with the conditions present at their property and undertake measures to prevent exacerbation of conditions and prevent third-parties, including trespassers, from being exposed to hazards that may be present on their property. This report serves as a helpful base for that information.
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# 1. INTRODUCTION

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## 1.1 PROBLEM DEFINITION

The Project was characterized by the risks posed by chemical containers and residues historically discarded in or near Torch Lake and along the north shoreline of the Portage Canal. These concerns are distinct and separate from the risks historically addressed under the U.S. Environmental Protection Agency's (EPA's) Superfund program. The RRD Superfund Section (SFS) has stated that the EPA defines the Torch Lake Superfund Site as the upper six inches (in.) of stamp sand and slag in certain areas of Houghton County and any soil cap and vegetative cover applied to such areas.

The remaining concerns at Torch Lake, the Portage Canal, and the surrounding areas identified by EGLE included known or suspected impacts to groundwater, surface water, sediments, and upland media that were not addressed under the Superfund program. Environmental impacts that were evaluated as part of the SI were assessed under the guidance of the following objectives:

- Investigate and document unidentified, significant in-lake and/or terrestrial sources of contamination including polychlorinated biphenyls (PCBs);
- Investigate and document bulk disposal areas, including made lands, stamp sand deposits, slag dumps, and landfills; and,
- Investigate and document industrial ruins including coal storage areas, underground storage tanks (USTs), asbestos containing materials (ACM), residual process materials (RPM), and any other waste materials identified during investigations.

Environmental impairments within Torch Lake and along the shorelines from Lake Linden to the Portage Lake Lift Bridge resulting from historical mining era industrial operations:

- Present potential exposure risk to human and ecological receptors;
- Limit the recovery of the Torch Lake and Portage Canal ecosystems;
- Create uncertainty over safe and beneficial reuse of the land; and,
- Delay delisting of Torch Lake as an Area of Concern (AOC) under the Great Lakes Water Quality Agreement due to Beneficial Use Impairments (BUIs) related to restrictions on fish and wildlife consumption because of the on-going presence of PCBs and mercury in fish and degradation of benthos because of metals contaminated sediments.

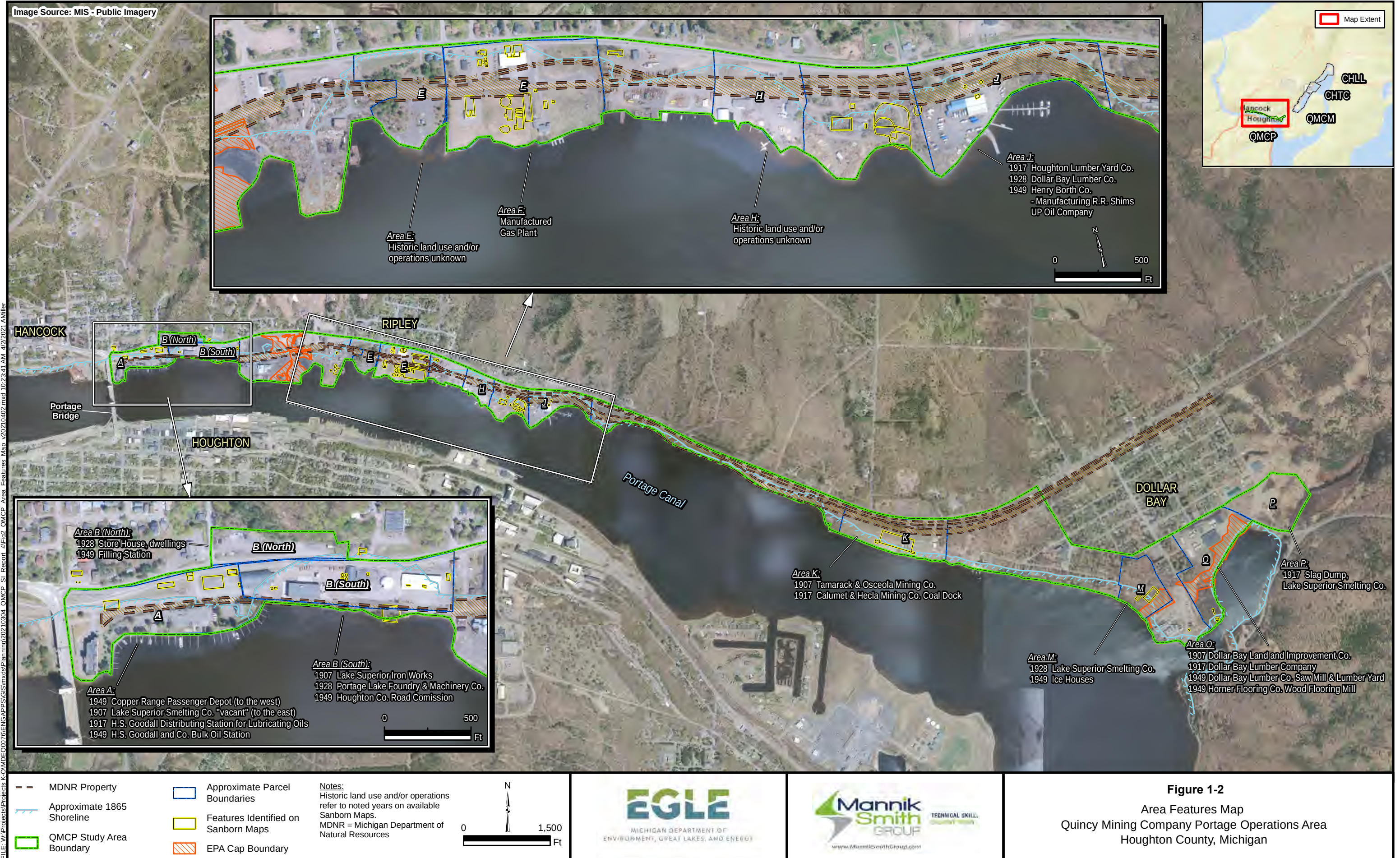
As such, the investigation was largely driven by documented observations of abandoned containers and/or other waste and debris locations in the lake and in upland areas, supported by documented historic operations.

Taking into account the specific objectives outlined above, the principal goal of this portion of the Project was to support a comprehensive management approach that would guide EGLE's decision making process in addressing potential human health and environmental risks present in the QMCP. The primary focus of the Project was to ascertain the source, nature, and extent of contaminants (including PCBs) in all affected environmental media (soil, groundwater, surface water, and sediments) within the Project study area, including the QMCP that consists of the former mining era industrial areas from the Portage Lake Lift Bridge in Hancock to Dollar Bay along the north shoreline of the Portage Canal. Refer to **Figure 1-1, Project Location Map**. Due to the varying nature of historical operations within the QMCP, subareas addressed as part of this SI work were as follows:

- Area A;
- Area B;
- Area E;
- Area F;
- Area H;
- Area J;
- Area K
- Area M;
- Area O; and,
- Area P.

The locations of the listed subareas are depicted on **Figure 1-2, Area Features Map** on the following page and in the Figures Section of this report.







## 1.2 PROJECT ORGANIZATION

Performance of the work required that both the Project team and the Project structure were focused and deliberate. The phased approach of the work required that data was processed and reported between team members to facilitate the next phase of work. The following subsections describe the Project team and the Project structure, as it relates to management and implementation.

### Project Team

The Project was developed and implemented by EGLE, building on the existing partnerships and stakeholder engagement in the local community. Field activities were completed by EGLE's Geological Services Section (GSS) (formerly the Geological Services Unit) and MSG. Analytical services were provided by EGLE's Environmental Laboratory or approved laboratories within the Contract Laboratory program.

### Project Structure

The Project area is located in Houghton County, Michigan along the shoreline and in Torch Lake and the Portage Canal, and mining era industrial facilities in Dollar Bay and on the Ripley Waterfront along the Portage Canal, the 270+ acre Centennial Mine, and other areas congruent with the Torch Lake Superfund Site where the response action has been limited to the application of vegetative cover or eliminating the area from further consideration.

Due to the complex nature and geographic expanse, RRD subdivided the Project into study areas based on past use and known issues. Dividing the regional operations into smaller manageable study areas allowed for prioritization of the proposed investigative approach, while also establishing a phased process for assessing environmental concerns regionally.

The QMCP, Quincy Mining Company Mason Operations Area (QMCM), Calumet and Hecla Lake Linden Operations Area (CHLL), and Calumet and Hecla Tamarack City Operations Area (CHTC) areas and their respective former industrial operations are depicted on **Figure 1-1, Project Location Map**. The aforementioned subareas that comprise the QMCP and major historical industrial operations within each subarea addressed in this SI Report are depicted on **Figure 1-2, Area Features Map** and described further in **Section 2**.

## 2. PROJECT DESCRIPTION

Hard rock mining operations were prevalent throughout Houghton and Keweenaw Counties for nearly a century, primarily spanning an era between the mid-1800s and the mid-1900s. As mining activities declined in the region, a majority of the mine holdings, including surface and underground operations were abandoned, scrapped, and remnants otherwise left in-place. The following subsections summarize both the operational and investigative history within the QMCP while also presenting the underlying rationale for the performance of the investigative activities.

### 2.1 SITE LOCATION AND DESCRIPTION

As previously discussed, the QMCP encompasses the former QMC copper mining and processing operations along the north shoreline of the Portage Canal on the south side of M-26 from Dollar Bay, Michigan to the Portage Lake Lift Bridge in Hancock, Michigan. The QMCP consists of approximately 320 acres of land, much of which is made-lands, extending approximately 4.5 miles along the shoreline of the Portage Canal and incorporates multiple parcels and property owners. Residential (single-family residences)/commercial/vacant, undeveloped forested lands, industrial (capped made lands) properties, and the Portage Canal border the QMCP. Due to the varying nature of historical operations within QMCP, the SI was organized by subareas within the footprint that have been subject to or associated with historic mining practices.

#### 2.1.1 Portage Canal

The subareas described in **Section 1** are located along the shoreline of the Portage Canal. Each of these former industrial operations relied on the waters of the Portage Canal for shipping, process water, and waste discharge. In addition, the communities established around these industrial facilities also used the lake for similar purposes, historically discharging sewage and other wastes into the lake.

A goal of the SI was to assess the potential presence of abandoned containers and wastes on the bottom of the Portage Canal in the QMCP and to more fully characterize the nature and extent of potential on-land contaminant sources. The evaluation of potential PCB sources and areas of PCB contamination in and around the Portage Canal were an integral component of the SI that support the long-term protection and rehabilitation of the interconnected waterways.

### 2.2 SITE BACKGROUND

This Section provides an overview of the historical industrial operations, the local topography, geology, and hydrogeology, and past investigations and response actions in the QMCP.

#### 2.2.1 Site History

Copper mining was extensive in the Keweenaw and formed the backbone of the regional economy and society. Copper ore milling and smelting operations were conducted from the mid-1860s to the 1960s, including the importation, reprocessing, and smelting of various scrap metals in the later years of operation. Consistent with past industrial practices, Torch Lake and the Portage Canal served as dumping grounds for virtually all mining industry related wastes, including tailings, slag, and various chemicals.

Based on a review of Sanborn Fire Insurance maps, prior QMCP land uses consisted of a combination of industrial operations including, but not limited to, foundry, machining, coal and coke handling, bulk fuel handling, and boiler works. Simultaneously with industrial development, made lands were created as indicated by the approximate 1865 shoreline depicted on **Figure 1-2, Area Features Map**. This is of importance as to the nature of the underlying fill material relative to the current areas of environmental interest.

Review of EGLE file information for QMCP identified subareas within the footprint that have been subject to or associated with historic mining practices. Parcels within the QMCP footprint that did not have identified mining-era uses were not further evaluated or included in subsequent reconnaissance activities. Due to the varying nature of historical land uses within QMCP, the following list provides an overview of known historic operations based on available Sanborn Maps and/or other resources for each of the subareas identified on **Figure 1-2, Area Features Map**.

- **Area A** – Historically, the western portion of Area A was the location of the Copper Range Railroad Passenger Depot. According to the 1907 Sanborn Map, a “vacant” Lake Superior Smelting Company was located to the east. The parcel is identified as the H.S. Goodell Distributing Station for Lubricating Oils in 1917 and the H.S. Goodell and Company Bulk Oil Station in 1949. The area is currently the location of a condominium complex and the Houghton County Marina.
- **Area B** – Review of the 1907 Sanborn Map indicates Lake Superior Iron Works operated in the southern portion of Area B. The site is identified as the Portage Lake Foundry and Machinery Company on the 1928 Sanborn Map and by 1949 was the location of the Houghton County Road Commission. The northern portion of Area B was identified as a Store House with additional dwellings in 1928 and the location of a filling station in 1949. Area B is currently the location of the Houghton County Road Commission.
- **Area E** – Historic land use and/or operations are unknown following review of available historic Sanborn Maps and other resources. The area is currently undeveloped and appears to be used for boat storage. In July 2018, a Michigan Department of Natural Resources (MDNR) surveyor observed potentially impacted soils within the MDNR trail property within Area E.
- **Area F** – A manufactured gas plant was in operation at the location of Area F, south of the MDNR trail property. Environmental concerns within this area have previously been addressed and further investigation as part of QMCP did not occur. A Filling Station and Bulk Oil Station that included various gasoline, kerosene, and fuel oil tanks, along with oil and oil pump houses operated within the northwestern portion of Area F, as identified on the 1949 Sanborn Map. Environmental concerns in this area will be addressed separate from QMCP. A commercial business currently operates at the location north of the MDNR trail property, while a residential building and vacant lot are located to the south and east, respectively.
- **Area H** – Historic land use and/or operations are unknown following review of available historic Sanborn Maps and other resources. Recent uses of the area include multiple commercial businesses including Dollar Bay Motor Sports, Isle Royale Seaplanes, and Wuebben Construction.
- **Area J** – Area J was the location of the Houghton Lumber Yard Company and the Dollar Bay Lumber Company, according to the 1917 and 1928 Sanborn Maps, respectively. However, according to the 1949 Sanborn Map, Henry Borth Company - Manufacturing R.R. Shims and UP Oil Company operated within the area. H&Y Marina currently operates at the location.
- **Area K** – According to the 1907 Sanborn Map, Tamarack and Osceola Mining Company had mining operations at the location. By 1917, the location was the site of a Calumet and Hecla Mining Company Coal Dock. The area is currently the location of a condominium complex.
- **Area M** – Lake Superior Smelting Company operated at the location, as identified on the 1928 Sanborn Map; however, only two ice houses remained at the site on the 1949 Sanborn Map. The EPA as part of the Torch Lake Superfund Site remedial action capped portions of Area M, N (not discussed in this report), and O. Dollar Bay Torch Lake EPA Superfund Site as-built drawings (USDA NRCS, 2004) indicate that the cap was placed as part of the Torch Lake Superfund Site Dollar Bay remedial action. The Fourth Five-Year Review Report for the Torch Lake Superfund Site (USEPA, 2018) indicated that construction was completed in 2002; however, the Dollar Bay parcel has not been deleted from the NPL. The capped areas are subject to an on-going EGLE operation and maintenance (O&M) plan. The balance of the areas were not addressed as part of the Torch Lake Superfund Site remedial action. A building that houses two production wells for water supply to Dollar Bay is currently located within the area. The area appears to be undeveloped with the exception of the Dollar Bay municipal wells.
- **Area O** – According to the 1907 Sanborn Map, Area O was the location of Dollar Bay Land and Improvement Company. The parcel is identified as Dollar Bay Lumber Company in 1917 and Dollar Bay Lumber Company

Saw Mill and Lumber Yard and Horner Flooring Company Wood Flooring Mill in 1949. Horner Flooring Co. Inc., a manufacturer of hardwood maple basketball flooring, currently operates at the location. The EPA as part of the Torch Lake Superfund Site remedial action capped portions of Areas M, N, and O. Dollar Bay Torch Lake EPA Superfund Site as-built drawings (USDA NRCS, 2004) indicate that the cap was placed as part of the Torch Lake Superfund Site Dollar Bay remedial action. The Fourth Five-Year Review Report for the Torch Lake Superfund Site (USEPA, 2018) indicated that construction was completed in 2002; however, the Dollar Bay parcel has not been deleted from the NPL. The capped areas are subject to an on-going EGLE O&M plan. The balance of the areas were not addressed as part of the Torch Lake Superfund Site remedial action.

- **Area P** – This area was not identified on available Sanborn Maps; however, further review of Monette's *Dollar Bay, Michigan, Fifty-Fourth of a Local History Series* (Monette, 2000), indicates that the parcel was owned by Lake Superior Smelting Company and was used as a slag dump. Recent use appeared to be a scrap/recycling facility called "The People's Store," and includes a residential and farm area to the east.

A summary of historical findings is presented in **Table 2-1, Summary of Historic Operations**.

Dollar Bay Torch Lake EPA Superfund Site as-built drawings (USDA NRCS 2004) indicate that the vegetated cap at Area M and Area O in the Dollar Bay portion of QMCP was placed as part of the Torch Lake Superfund Site Dollar Bay remedial action. Quincy Smelter Reclamation Project as-built drawings (USDA NRCS 2010) indicate that a vegetated cap was also placed at Quincy Smelting Works to the east of Area B. The capped areas are subject to an on-going EGLE O&M plan. The approximate limits of capping are depicted on **Figure 1-2, Area Features Map**.

### 2.2.2 Topography and Local Geology

The QMCP is located along the north shoreline of the Portage Canal on the south side of M-26 from Dollar Bay, Michigan to the Portage Lake Lift Bridge in Hancock, Houghton County, Michigan. The shoreline in this area was historically characterized by industrial operations that included large-scale copper mining-related operations. Simultaneously with industrial development, made lands were created along the shoreline as indicated by the 1865 shoreline depicted in **Figure 1-2, Area Features Map**. Waste materials, such as stamp sand from industrial operations, were also deposited along the shoreline, dramatically changing the natural shoreline of the Portage Canal and the lake bottom.

At a mean elevation of approximately 600 feet (ft) Above Mean Sea Level (AMSL) at the shoreline of the Portage Canal, the land slopes gently to the north from the shoreline to an approximate elevation of 630 ft AMSL along Highway M-26. The vicinity of Highway M-26 is generally characterized by residential and commercial developments that are generally built up along the toe of the hillside on the north side of M-26. North of Highway M-26, and the centrally developed area along the highway, the grade continues to increase towards the north, away from the Portage Canal, reaching elevations up to 1,200 ft AMSL along Highway U.S. 41. Numerous residential properties are scattered across the hillside along rural roads that connect the upper and lower highways, but also in small clusters of homes that generally developed as employee housing around historic mining locations. The unincorporated community of Ripley is located to the north of the QMCP, where elevations reach 700 ft AMSL at the north end of the residential area. The village of Dollar Bay is located to the east, where elevations remain around 620 ft AMSL.

The QMCP is located within the Lake Superior Basin and the Keweenaw Peninsula Watershed. There are small, unnamed creeks, streams and storm water outlets that discharge to the Portage Canal in the vicinity. The largest is Gooseneck Creek which discharges to the designated wetland area located northeast of Dollar Bay.

According to the *Soil Survey of Houghton County Area, Michigan* issued in October 1991 by the United States Department of Agriculture (USDA) – Soil Conservation Service (SCS), the near surface geology in the QMCP generally consists of soils that have been covered with fill in areas south of Highway M-26.



- For soils in the QMCP, the USDA generally describes the soils as being in “...areas that have been covered with fill. In some areas the upper one to two feet of the original soil material has been removed for use as topsoil. The texture ranges from sand to clay loam. In most areas the soils are somewhat excessively drained to moderately well drained, but in some areas they are somewhat poorly drained or poorly drained. Many of these areas are old copper mill sites and contain numerous foundations and abandoned railroad grades.”

According to the map Quaternary Geology of Michigan (compiled in 1982 by W.R. Farrand and published by the Michigan Geological Survey), the near surface fill material and sands are underlain by native soils described as “coarse-textured glacial till.” The bedrock in the area of the QMCP consists of Portage Lake Lava Series to the west and Jacobsville Sandstone to the east according to the *Bedrock Geology of Michigan* (R.L. Milstein, 1987).

Soil observations during the SI activities indicate that the subsurface within the QMCP area is generally comprised of fine to medium or medium to coarse brown sand to the end of boring, which was typically between 7 and 12 feet below ground surface (ft bgs). At least some of the encountered media, though recorded as sand, was likely stamp sand.

### **2.2.3 Local Hydrogeology**

According to EGLE’s Well Water Viewer, drinking water in the area is obtained entirely from groundwater sources. The community of Ripley is served by two municipal wells located at the end of Burt Street, north of Highway M-26. Two municipal wells that are both 100 feet deep were located at the former Quincy Smelting Works in Ripley. The community of Dollar Bay is served by two municipal wells located at the end of Horner Street in Dollar Bay. The municipal wells are 44 and 64 feet deep and were constructed in 1958 and 1979, respectively. Three additional municipal wells located approximately 1 mile southwest of the QMCP study area on the south shore of the Portage Canal provide drinking water to approximately 7,500 residents of the City of Houghton. Residential wells are used to provide water to the remainder of the population within the four-mile radius of the QMCP, while the Michigan American Water Company operates public water supply wells outside of the four-mile search radius. Please note that the search results are not a detailed representation of every potential groundwater receptor, nor did the search include a comprehensive assessment of water service in the QMCP.

Based on geological composition, it has been noted that the shallow glacial aquifers and bedrock aquifers in the region are likely interconnected. As noted in the preceding subsection, several small streams drain to the Portage Canal near the QMCP. The Portage Canal and the Keweenaw Waterway connect to Lake Superior.

During the SI activities, saturated soil conditions were generally encountered between depths of 3 ft and 9 ft bgs.

### **2.2.4 Overview of Regulatory Investigations and Response Actions**

The Project area, including the lands and waterways throughout the Keweenaw Peninsula, were the location of copper milling and beneficiation activities beginning in circa 1868. The environmental legacy resulting from over 100 years of mining led to Torch Lake and its western shoreline, and surrounding water bodies and former mining era industrial properties throughout Houghton County to be designated as a Superfund site by the EPA [Torch Lake Superfund Site](#) and Torch Lake as a Great Lakes Area of Concern by the U.S. government (in consultation with the States) under the Great Lakes Water Quality Agreement [Torch Lake AOC](#). The EPA undertook cleanup activities to address some of the byproducts of the mining industry while others were not addressed or left to recover through natural processes. Through a series of studies EPA concluded the Torch Lake Site posed actual or threatened releases of hazardous substances that may present an imminent and substantial endangerment to public health, welfare, or the environment. Given the complexity of the region wide issue, the EPA’s 1992 Record of Decision (ROD) divided the Torch Lake Site into three Operable Units (OUs):

- **OU 1** includes surface tailings, drums, and slag pile/beach on the western shore of Torch Lake. These tailing piles include stamp sands in Lake Linden, Hubbell/Tamarack City, and Mason, while a slag pile/beach is located in Hubbell;
- **OU 2** includes groundwater, surface water, submerged tailings and sediments in Torch Lake, Portage Lake, the Portage Canal, and other water bodies; and,
- **OU 3** includes tailings and slag deposits located in the north entry of Lake Superior, Michigan Smelter, Quincy Smelter, Calumet Lake, Isle-Royale, Boston Pond, and Grosse-Point.

The OU 1 and OU 3 remedy selected and implemented by the EPA required that stamp sands, tailings, and slag piles be covered with soil and vegetation, and that use restrictions be put in place to protect the covered materials' long-term integrity. Through these measures it was concluded that the following Remedial Action Objectives (RAO) would be met:

- Reduce or minimize potential future risks to human health associated with the inhalation of airborne contaminants from the tailings and/or slag;
- Reduce or minimize potential future risks to human health associated with direct contact with and/or the ingestion of the tailings and/or the slag;
- Reduce or minimize the release of contaminants in tailings to the groundwater through leaching; and,
- Reduce or minimize the release of contaminants in tailings to the surface water and sediment by soil erosion and/or air deposition.

The EPA selected a "No Action" remedy in their 1994 ROD for OU 2. To meet the RAO, the remedy selected for OU 2 took into consideration and relied upon:

- The reduction of stamp sand loading to surface water bodies expected as a result of the remedial action taken at OU 1 and OU 3;
- Ongoing natural sedimentation and detoxification such as that which is occurring in other surface water bodies in the area;
- Institutional programs and practices controlling potential future exposure to site-affected groundwater which are administered at the county and state level; and,
- The long-term monitoring and the five-year review process monitoring requirements of the remedy selected for OU 1 and OU 3 under the 1992 ROD.

The QMCP study area is located within the Torch Lake Superfund Site footprint; however, the properties south of M-26 identified for assessment were not included in the Torch Lake Superfund Site OU1, nor were remedies put in place to mitigate environmental conditions on the properties except as described in **Section 2.2.1** above for certain Dollar Bay locations and at the Quincy Smelting Works which was not further investigated during this SI since environmental concerns at that property are being addressed by other entities. OU 2, for which EPA selected a no-action alternative, includes groundwater, surface water, submerged tailings (stamp sands), and sediment that were also investigated.

Numerous environmental investigations and response activities have been completed within the QMCP by state and federal agencies as well as private parties. The investigations were conducted on and along the north shoreline of the Portage Canal with various purposes, often specific to a particular property or investigative focus. Although often referenced in individual reports, a comprehensive approach consolidating the findings of these investigations had not been completed to date.

The data and information derived from these investigations were assimilated and compiled by EGLE and summarized by MSG in a document entitled *Historical Data Review and Compilation Technical Memorandum Abandoned Mining Wastes – Torch Lake Non-Superfund Site – Quincy Mining Company Portage Operations Area* dated August 2018 and discussed further in **Section 3**. The findings of these investigations and the conclusions derived from the performance of each assessment were selected to assist in the identification of historic areas of contamination or data gaps requiring further assessment.

Response actions completed in the QMCP include the aforementioned capping activities completed by the EPA. “The stabilization and covering of contaminated mine tailings and slag material in areas of Torch Lake or surrounding water bodies also reportedly included the recording of institutional controls, the natural recovery of area water bodies, and long-term monitoring of area water bodies and groundwater (EPA, 2008).” The capped area of the Quincy Smelting Works within the QMCP was delisted from the (National Priorities List) Torch Lake Superfund Site in 2013, while the capped portion of The Torch Lake Superfund Site Dollar Bay has not been deleted from the NPL. EGLE has taken responsibility for operation and maintenance activities in those areas where remedial actions have been implemented, regardless of listing.

Investigations in the QMCP have identified elevated levels of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), being predominantly polynuclear aromatics (PNAs), PCBs, and inorganic contaminants. Areas with concerns along the shoreline of the Portage Canal, identified by EGLE and others, include known or suspected impacts to groundwater, surface water, sediments, and upland media that were not addressed under the Superfund program.

### 3. FIELD PROCEDURES AND SAMPLE COLLECTION

The field procedures and sample collection activities that were implemented in the QMCP were used to evaluate the presence of contaminated environmental media in the industrial areas described in **Section 2**. This Section describes the phased approach for reviewing and assessing each area and the subsequent field sampling and laboratory analysis that followed.

#### 3.1 PLANNING AND COORDINATION

The assessment and investigation of the QMCP included several steps that served as the foundation for the *Sampling and Analysis Plan for the Abandoned Mining Wastes Torch Lake Non-Superfund Site, Quincy Mining Company Portage Operations Area, Houghton County, Michigan* (SAP) prepared by MSG in August 2018 and periodically amended based on interim SI findings. The following subsections describe the research, mapping, and testing procedures that were utilized during SAP development to ensure that the investigative activities were not redundant and focused on the goals and objectives established by EGLE.

##### 3.1.1 Historical Research and Data Compilation

The implementation of the investigative portion of the SI was closely linked to the collaborative efforts of the Project team, described in **Section 1**. The review of EGLE file information, including available Sanborn Maps and/or other resources for each area was critical to the development of the SAP since the findings specifically identified the location of facilities and operational areas that were historically subject to or associated with historic mining practices. The following provides a summary of the activities completed by EGLE and summarized by MSG that were used to support SAP development:

- Identification of potential sources of contaminants of concern (COCs), including PCBs, through the evaluation of previously collected data.
- Investigation of resources related to buildings and/or operations of environmental concerns by subarea.
- Completion of mapping activities based on collected historic data, and field inspections noting the location of foundations and building remnants.

A summary of historical findings is presented in **Table 2-1**, *Summary of Historic Operations*.

##### 3.1.2 Data Compilation Technical Memorandum

As outlined in **Section 2**, the comprehensive nature of the SI entailed not only a historical operational perspective, but also required that the results of previous investigative activities be incorporated. The evaluation and interpretation of analytical results and findings from previous key investigations was completed to create a baseline understanding of conditions in the QMCP and along the Portage Canal. The incorporation of these findings into the sampling program not only minimized redundancies in data collection, but also created a more comprehensive approach for assessing potential environmental impacts.

The following is a list of the key documents summarized in the *Historical Data Review and Compilation Technical Memorandum Abandoned Mining Wastes – Torch Lake Non-Superfund Site – Quincy Mining Company Portage Operations Area* dated August 2018:

- Michigan Department of Transportation M-DOT M-26, Ripley, Houghton County Hydrogeological Investigation – April 18, 1991. Prepared by M-DOT Geoenvironmental Services Unit Materials & Technology Division.
- 1<sup>st</sup> Preliminary Report Dollar Bay Wells – March 31, 1995. Prepared by Traverse Engineering Services.

- Letter of Notice Re: Complaint Inspection, Julio Construction Property Adjacent to Keweenaw Canal, Ripley, Houghton County – December 12, 1995. Prepared by Michigan Department of Environmental Quality (MDEQ, now EGLE).
- Phase II Hydrogeological Investigation Report, Houghton County Road Commission Ripley Garage – August 1998. Prepared for Houghton County Road Commission. Prepared by SCA Environmental.
- Brownfield Redevelopment Assessment Report for Hancock/Ripley Trail Property – November 25, 2002. Prepared by MDEQ.
- Summary Report for the Torch Lake Area Assessment, Torch Lake NPL Site and Surrounding Area, Keweenaw Peninsula, Michigan – December 13, 2007. Prepared by Weston Solutions, Inc.
- Letter of Notice Re: Dollar Bay Well Field, Dollar Bay, Houghton County, Site ID: 31000089 – August 4, 2010. Prepared by the Michigan Department of Natural Resources and Environment (DNRE, now EGLE).
- Baseline Environmental Assessment: Royce Road Marina, Royce Road, Franklin Township, Houghton County, MI 49930 – October 26, 2015. Prepared by TriMedia Environmental & Engineering (TriMedia).
- Correspondence between Horner Flooring Co. Inc. and MDEQ – April 3, 1995.
- Quincy Mining Company Portage, Houghton County, Site ID #31000098, Bathymetric Investigation-Side Scan Sonar– January 9, 2018. Prepared by MDEQ.

In support of developing a comprehensive approach for evaluating risks, the analytical results from the investigations summarized above were compiled and compared to the same regulatory criteria. Consistent with this approach, the same regulatory criteria were used to evaluate the analytical results collected during the SI. The regulatory criteria utilized for evaluating analytical results from surface soil, subsurface soil, groundwater, sediment, surface water, building materials, and waste deposits are discussed in detail in **Section 4**.

The analytical results from these key investigations were used to characterize the QMCP and contributed to the horizontal and vertical placement of the proposed sampling locations presented in the SAP. Consequently, the review and evaluation of the summarized reports resulted in the preparation of a SAP that built upon existing analytical results and focused on potential risks posed to human health and ecological receptors. In addition, the SI was also guided by the documented observations of drum and/or other debris locations as well as considerations related to historic operations and potential PCB presence.

### **3.1.3 Offshore Mapping and Procedural Testing**

Without available analytical results from surface water and sediment samples, it could not be determined whether contaminants emanating from documented contamination on land were impacting the nearshore aquatic environment of the Portage Canal. The visual confirmation of the underwater targets was a key component to the Project, distinguishing it from previous investigations by eliminating the concept of “blind” sampling and focusing sample locations on specific waste deposits.

Evaluation of these underwater features as part of the SI required the use of advanced technological methods to identify specific targets for sample collection. Completion of these tasks again relied upon the collaborative efforts of the Project team to conduct underwater mapping and video surveillance of the lake bottom.



In 2017, EGLE's GSS conducted a side scan sonar survey of the three investigative lake bottom areas located in the Portage Canal offshore from the communities of Ripley and Dollar Bay. Areas were scanned using a Hummingbird 797c<sup>2</sup> equipped with an external global positioning (GPS) antenna, results were interpreted, and areas where targets were most likely to be present were identified. The intent of the assessment was to collect qualitative data that could be used to develop a plan for more traditional investigation, sampling, and assessment of potential offshore contaminant sources. The side scan sonar images generated by EGLE's GSS are included in **Appendix A, Side Scan Sonar Imagery**.

The next step of the investigation included visual confirmation of the targets that were identified through the interpretation of the side-scan sonar imagery. EGLE's GSS deployed their Remotely Operated Vehicle (ROV) at select locations to investigate and provide visual evidence of potential drum locations and similar anomalous underwater features. Underwater images and videos obtained from the ROV are included in **Appendix B, Underwater Videos**.

### 3.1.4 Sampling and Analysis Plan Development

The development of the SAP for the QMCP was focused on ensuring that it considered relevant historic operational and investigative findings. Identification of buildings and facility operations provided an understanding of potential chemicals and waste streams that may have been used or disposed of on a given property. For example, PCBs are often regarded as an oil or fluid used in electrical generating facilities, but PCBs were also used for their fire retardant properties in electrical cables.

With an understanding of the historical operations, the findings of previous terrestrial analytical data were evaluated. Data was assessed with regard to the historical operations, but also to evaluate whether concentrations of specific COCs were present. If identified, the horizontal and vertical distribution was then evaluated. The evaluation considered whether additional data was needed to further delineate the extent of contamination or evaluate whether a potential source of contamination was contributing to the detection of contaminants. Similarly, the lack of analytical data in the study area, such as any available offshore analytical data, was also considered to determine if data gaps were present.

The risks posed to human health and the environment resulting from historical mining era industrial operations in the QMCP:

- Present potential exposure risk to human and ecological receptors;
- Limit the recovery of the Portage Canal ecosystem; and,
- Create uncertainty over safe and beneficial reuse of the land.

As such, the investigation was largely driven by documented historic operations and potential PCB concentrations in terrestrial portions of the QMCP. The prevailing COCs in the QMCP generally include organic and inorganic contaminants in surface and subsurface soils, groundwater, sediment, surface water, waste, and RPM. In addition, observed waste deposits and building materials were suspected to contain asbestos in addition to organic and inorganic contaminants. As a result, the SAP identified key analytes in environmental media for assessment during the SI. Although PCBs were prescribed for analysis in all environmental media, the selection of remaining analytes were subject to field observations and the judgment of the field teams collecting the samples. The following provides a summary of the target analytes defined in the SAP with respect to the investigated environmental media:

#### Surface Soils/Waste Deposits (0 to 6 inches below ground surface [bgs])

- Inorganic COCs (Metals and Available Cyanide) by EPA Methods 6010/200.7, 6020/200.8, 7471/245.5, and ASTM D7284;
- VOCs by EPA Method 8260;
- PCBs by EPA Methods 8081/8082;
- SVOCs by EPA Method 8270; and,

- Asbestos by Polarizing Light Microscopy (PLM) – California Air Resource Board (CARB) 435 – 1,000 point count – analytical sensitivity 0.1 percent (%).

#### Subsurface Soils (> 6 inches bgs)

- Inorganic COCs (Metals and Available Cyanide) by EPA Methods 6010/200.7, 6020/200.8, 7471/245.5, and ASTM D7284;
- VOCs by EPA Method 8260;
- PCBs by EPA Methods 8081/8082; and,
- SVOCs by EPA Method 8270.

#### Groundwater

- Inorganic COCs (Metals) by EPA Methods 6010/200.7, 6020/200.8, and 7471/245.5;
- VOCs by EPA Method 8260;
- PCBs by EPA Methods 8081/8082; and,
- SVOCs by EPA Method 8270.

#### Sediment

- Inorganic COCs (Metals) by EPA Methods 6010/200.7, 6020/200.8, and 7471/245; and,
- PCBs by EPA Methods 8081/8082.

#### Surface Water

- Inorganic COCs (Metals) by EPA Methods 6010/200.7, 6020/200.8, 7471/245.5;
- PCBs by EPA Methods 8081/8082; and,
- SVOCs by EPA Method 8270.

#### Drums, Containers, Building Materials, Bulk Asbestos, Waste Deposits and Residual Process Materials – Not Associated with Sediment/Depositional Wastes

- Inorganic COCs (Metals) by EPA Methods 6010/200.7, 6020/200.8, 7471/245.5;
- PCBs by EPA Methods 8081/8082;
- Bulk Asbestos by PLM Method 600/R-93/116; and,
- Waste Characteristics by various methods.

Inorganic COCs were selected for analysis based on an assessment of historical exceedances of applicable regulatory criteria. Eleven inorganic COCs and cyanide were initially selected for analyses. The following provides a list of the selected inorganic analytes evaluated during the SI:

- Arsenic
- Barium
- Cadmium
- Chromium
- Copper
- Cyanide
- Lead
- Manganese
- Mercury
- Selenium

- Silver
- Zinc

The species of chromium, trivalent versus hexavalent, was assessed and determined for environmental media during previous investigations in the area. The *Public Health Assessment for Evaluation of Inhalation of Airborne Stamp Sands in the Torch Lake Superfund Site and Surrounding Area* (Michigan Department of Community Health (MDCH), 2014) noted that “one would not expect the hexavalent chromium form to occur in stamp sands because the trivalent chromium is typically the predominant form of chromium in the environment.” Therefore, samples analyzed during the SI were not further assessed for hexavalent chromium and regulatory criteria for trivalent chromium were utilized in the subsequent evaluation of data (both historical and current) derived from the QMCP.

## 3.2 FIELD PROCEDURES AND SAMPLE COLLECTION

Similar to SAP development, the implementation of field activities in the QMCP were conducted in several terrestrial and offshore phases to ensure that sufficient data was available to adequately characterize the potential human health and environmental risks present in each study area. Field sampling activities were generally completed during mobilizations in September 2018.

The following subsections summarize the procedures and methodologies used during the SI.

### 3.2.1 Potential Physical and Health Hazard Inventory

The evaluation of the QMCP included a physical inspection of the properties within the study area. Field inspections were conducted on properties where written access was granted to EGLE. In the cases where access was not requested based on historic operational and investigative findings, or access was not obtained, property conditions were evaluated from MDNR property, a neighboring property where access was obtained, or public right of way. The inspections included the locating and inventory of historical structures and artifacts associated with the former mining era operations within the QMCP. Each property or subarea was also inspected for potential physical and health hazards. Such hazards included potentially abandoned drums and containers, suspect asbestos containing materials (SACM), stained or oily soils, and similar observed environmental conditions. Potential physical hazards, including waste deposits, metal debris, and similar conditions were also recorded in areas accessed.

The effort included the development of field inspection tables that incorporated photographic documentation and written descriptions of identified features. Reconnaissance activities were completed at all of the properties in the QMCP. A Reconnaissance Log was used to document the general characteristics of the property including the inventory and documentation of mining era features, if any, for each property. The form was also used to document potential physical and health hazards identified on the property that warranted further inspection or sampling to adequately characterize potential risks. Completed Reconnaissance Logs are included in **Appendix C, Site Inspections – Reconnaissance Logs, Targeted Inspections & Physical Hazards Inventory**.

The findings of the reconnaissance activities were used to facilitate the next phase of inspection. Targeted inspections included revisiting documented hazards and collecting samples to better characterize the perceived risks documented during reconnaissance. It should be noted that targeted inspection activities did not occur in all subareas due to site inspection reconnaissance evaluation. The following provides a summary of the various media that either were sampled or were considered for sampling during the targeted inspection activities:

- Documented SACM was sampled by a State of Michigan licensed asbestos inspector. The sampled media was asphaltic roofing material.

- Documented abandoned containers were not opened and sampled due to health and safety considerations; however, exposed contents or surface soils adjacent to the containers were considered for sampling.
- Documented abandoned container contents and RPM were considered for sampling.
- Soil and groundwater were sampled to characterize Site conditions based on historic use and observation of potentially contaminated areas.

### 3.2.2 Bulk Material Sampling

An MSG State of Michigan licensed asbestos inspector collected one bulk SACM sample during the Fall 2018 sampling event. The sample location was based on documented SACM and included asphaltic roofing material observed in Area M. In accordance with the SAP, MSG utilized dedicated sampling equipment for each sample to prevent potential cross contamination of asbestos fibers and samples were placed in sealable plastic bags/containers. Each sample bag was labeled with the unique sample identifier, date, and time of sampling following sample collection. Sampling data—including sample analyses, sample collection times and dates—were recorded on laboratory chain-of-custody forms. The samples were submitted under chain-of-custody to TestAmerica, Inc. North Canton, Ohio for analysis of asbestos content by PLM analyses.

The sampled location was located with a GPS unit with sub-meter accuracy and photographed. A summary of the targeted inspection sampling, including descriptions, requested analyses, and other relevant information is included on **Table 3-1, Sampling and Analysis Summary**. Findings are provided in **Section 12**.

### 3.2.3 Surface Soil Sampling

Proposed surface soil sampling locations were predetermined in the SAP based on the evaluations and assessments presented in **Section 3.1**.

Surface soil samples were collected from proposed surface soil (0-6 in.) sampling locations throughout the QMCP. A total of 15 surface soil samples (SS designation), including quality assurance (QA)/quality control (QC) samples, were collected from the QMCP. Disposable (dedicated) scoops were used to collect soil from a depth of 0 to 6 inches below the ground surface. Samples were placed in laboratory-supplied, 8-ounce glass jars in accordance with the SAP. Sample labels containing the unique sample identifier, date and time of sampling were attached to each 8-oz jar prior to sample collection. Sampling data—including sample analyses, sample collection times and dates—were recorded on laboratory chain-of-custody forms. The samples were submitted under chain-of-custody to EGLE's Environmental Laboratory in Lansing, Michigan for analysis as outlined in the SAP. Each of the sample locations were located with a GPS unit with sub-meter accuracy and a description of the sampled material was documented on a field log. A photographic log documenting representative sample collection activities is included in **Appendix D, Photographic Log**. A summary of the samples collected, including their descriptions, requested analyses, and other relevant information is included in **Table 3-1, Sampling and Analysis Summary**. Sampling locations, analytical results, and findings are included in **Section 5** through **Section 14** of this SI Report.

### 3.2.4 Subsurface Soil Sampling

Proposed subsurface soil sampling locations were predetermined in the SAP based on the evaluations and assessments presented in **Section 3.1**.

Prior to subsurface investigative activities, proposed investigative locations were cleared of potential underground utility lines or other anomalies prior to mobilization. MSG staked the investigative locations, Michigan's one-call system was notified of the scheduled work in accordance with *Public Act 174, Miss Dig Underground Facility Damage Prevention*

and Safety Act, a joint utility meeting was conducted, and utility lines within were marked by the respective utility companies. Additionally, GSS performed ground penetrating radar (GPR) activities at proposed boring locations to identify any additional underground anomalies prior to the commencement of fieldwork.

Subsurface soil samples were collected from throughout the QMCP. A total of 24 subsurface soil samples (SB designation), including QA/QC samples, were collected from the QMCP in accordance with the SAP. EGLE's GSS utilized a track-mounted direct-push drill rig to retrieve continuous soil cores from the subsurface by advancing a 5-foot long, 1.5-inch diameter Macro-Core sampler to the desired depth. Borings were advanced into the groundwater table and subsurface soil samples collected for laboratory analysis were selected based on field screening results and visual or olfactory indication that contamination may be present. The lithology for each boring was classified by the field geologist in accordance with the Unified Soil Classification System (USCS) and recorded on the field log and screened with a photoionization detector (PID). Subsurface soil samples were collected from the vadose zone and select borings were chosen for the collection of groundwater samples based on field observations.

The samples were submitted under chain-of-custody to EGLE's Environmental Laboratory in Lansing, Michigan for analysis as outlined in the SAP. Each of the sample locations were located with a GPS unit with sub-meter accuracy and a description of the sampled material was documented on a field log. A photographic log, documenting representative sample collection activities, is included in **Appendix D, Photographic Log**. Completed boring logs are included in **Appendix E, Boring Logs**. A summary of the samples collected during the investigation, including their descriptions, requested analyses, and other relevant information is included on **Table 3-1, Sampling and Analysis Summary**. Sampling locations, analytical results, and findings are included in **Section 5** through **Section 14** of this SI Report.

### 3.2.5 Groundwater Sampling

Certain soil boring locations were selected to include the installation of a temporary groundwater sampling point. Groundwater samples were collected utilizing a Screen-Point-16 (SP-16) stainless steel screen reusable sampling rod and were collected from throughout the QMCP. At some locations existing monitoring wells were sampled. A total of 26 groundwater samples (GW or MW designation), including QA/QC samples, were collected from the QMCP in accordance with the SAP.

During sample collection with the SP-16, the downhole sampling tools were advanced into the water-bearing zone in the boring and the outer rod was withdrawn to expose the internal stainless steel screen. A low-flow peristaltic pump with disposable Teflon tubing was used to collect a grab groundwater sample from the screened sample interval of the SP-16 or existing monitoring well. Field parameters for dissolved oxygen (DO), pH, oxidation reduction potential (ORP), conductivity, temperature, and turbidity were measured with a water-quality monitoring instrument equipped with a flow-through cell at the time of groundwater sample collection. Groundwater samples were pumped directly into laboratory-provided sample jars. Sample jars were then labeled and placed in a cooler on ice for transportation under chain of custody to EGLE's Environmental Laboratory in Lansing, Michigan for analysis as outlined in the SAP.

Each of the sample locations were located with a GPS unit with sub-meter accuracy and a description of the sample interval documented on a field log. A photographic log documenting representative sample collection activities is included in **Appendix D, Photographic Log**. GSS-completed boring logs documenting the temporary well screen intervals are included in **Appendix E, Boring Logs**. A summary of the samples collected during the investigation, including their descriptions, requested analyses, and other relevant information is included on **Table 3-1, Sampling and Analysis Summary**. Sampling locations, analytical results, and findings are included in **Section 5** through **Section 14** of this SI Report.

### 3.2.6 Sediment Sampling

Select sediment sampling locations were predetermined in the SAP based on the evaluations and assessments presented in **Section 3.1**. Other sediment sampling locations presented in the SAP were subject to change based on the findings of the underwater surveillance. These locations were moved with the intent of collecting material from the interior of submerged containers or from identified waste deposits based on GSS's underwater imagery targeting, a key element of the SI distinguishing it from previous investigations.

Sediment samples were collected from the Portage Canal and Dollar Bay. A total of 30 sediment samples (SD and SS designations), including QA/QC samples, were collected from the QMCP in accordance with the SAP, 17 of which were offshore from subareas included in this SI Report. Sediment samples were collected utilizing the EGLE GSS's vibracore sampler. Polycarbonate tubing was advanced into the sediment using the vibrating drive head. The extracted sample core was opened, the sediment column logged, samples were collected using the prescribed intervals in the SAP or visual observations, including physical characteristics and staining, or olfactory evidence of contamination within the sediment sample core. The lithology for each sediment core was classified by the field geologist in accordance with the USCS and recorded on the field log. Sediment samples were transferred directly into laboratory-provided sample jars. Sample jars were then labeled and placed in a cooler on ice for transportation to the analytical laboratory under chain of custody. Offshore samples were maintained separately from terrestrial samples.

Each of the sample locations were located with a GPS unit with sub-meter accuracy and a description of the sample core was documented on a field log. A photographic log, documenting representative sample collection activities, is included in **Appendix D, Photographic Log**. Completed sediment logs are included in **Appendix F, Sediment Core Logs**. A summary of the samples collected during the SI, including their descriptions, requested analyses, and other relevant information is included on **Table 3-1, Sampling and Analysis Summary**. Sampling locations, analytical results, and findings are included in **Section 15** of this SI Report.

### 3.2.7 Decontamination Procedures and Management of Investigative Derived Wastes

Investigative-derived wastes (IDW) include the byproducts of the field activities, including excess sample media, spent sampling supplies, and expendable personal protective equipment (PPE). The following paragraphs describe the procedures used during the SI to manage IDW and decontaminate equipment used during the investigation.

During implementation of the terrestrial investigation soil cuttings, purge water, and decontamination water were generated. Soil cuttings, following logging, screening, and sampling, were returned to the boring by EGLE. For locations where groundwater samples were collected, the soil cuttings were temporarily staged until all samples were collected and the sampling equipment was extracted from the boring. Excess groundwater generated during sample collection was discharged to the ground surface by EGLE. Following groundwater sampling, the boring was backfilled with the staged soil cuttings. Expendable groundwater sampling materials were containerized in a trash bag for disposal as non-hazardous municipal solid waste by EGLE at the end of the project phase. Reusable equipment, including the stainless steel sampling screen, was decontaminated between boring locations. Decontamination water generated through washing and rinsing was discharged to the ground surface in the vicinity of the sampling locations. Spray bottles of wash and rinse water were used to minimize the volume of decontamination fluids generated by the soil boring and well installation activities.

Implementation of the offshore sampling activities resulted in the generation of similar waste streams. Spent polycarbonate tubing used in the collection of vibracore sediment samples, spent sampling supplies, and PPE were temporarily staged on the sampling vessel until the vessel returned to the dock. Upon returning to shore, the staged waste was transferred to a dumpster by EGLE for disposal. Excess sediment, debris, and surface water generated as a result of the sampling activities were returned to the lake in the vicinity of the sample location by EGLE.



Reusable equipment was decontaminated on board the sampling vessel using an Alconox™ wash and rinse. Spray bottles of wash and rinse water were used to minimize the volume of decontamination fluids generated during the sediment sampling activities. Decontamination water generated through washing and rinsing was discharged to the lake in the vicinity of the sample location.

### 3.2.8 Sample Handling, Tracking, and Custody Procedures

All samples were identified, handled, shipped, tracked, and maintained under chain of custody as prescribed in the SAP. The following paragraphs summarize the sample management and tracking activities used during implementation of the SI.

Samples collected during the SI were given a unique sample identification (ID) number that was project- and location-specific. A record of sample ID numbers was kept with the field records and recorded on chain-of-custody forms. Sample labels using the nomenclature defined in the SAP were affixed to sample containers. After labeling, each sample was placed in a cooler with ice for transportation to the specified laboratory. Field documentation, including sampling forms, maps, and field logs were maintained in a field binder maintained by EGLE and MSG field personnel.

The field team used laboratory-provided sample custody forms to maintain and document sample integrity during sample collection, transportation, and storage. The chain of custody forms were used to document samples collected and the analyses requested. Chain of custody procedures documented the possession of individual samples from the time of collection in the field to the time of acceptance at the laboratory. Copies of the chain of custody records and the air bills (as needed) were retained and placed in the EGLE project file.

Laboratory chain-of-custody began with sample receipt and continued until samples were discarded. Sample coolers were generally hand delivered to the laboratory where a designated sample custodian received the incoming samples. The laboratory sample custodian recorded pertinent information associated with the samples, including the person(s) delivering the samples, the date and time received, and sample condition at the time of receipt (sealed, unsealed, or broken container; temperature; and other relevant remarks).

Investigative samples were delivered by a courier or shipped under chain of custody to the laboratories listed in the table below.

| Matrix                                                                      | Laboratory Name               | Laboratory Address                                         | Laboratory Contact Name                         | Laboratory Phone Number |
|-----------------------------------------------------------------------------|-------------------------------|------------------------------------------------------------|-------------------------------------------------|-------------------------|
| Surface Soil<br>Subsurface Soil<br>Groundwater<br>Surface Water<br>Sediment | EGLE Environmental Laboratory | 3350 N. Martin Luther King Blvd.<br>Lansing, MI 48906-2933 | EGLE Laboratory Services Section<br>Kirby Shane | (517) 335-9800          |
| Bulk Asbestos and Asbestos in Soil                                          | Eurofins TestAmerica, Inc.    | 4101 Shuffel Street NW<br>North Canton, OH 44720           | Kris Brooks                                     | (330) 966-9790          |

The EGLE Environmental Laboratory does not perform asbestos analyses. As a result, the samples were shipped under chain of custody and managed by the EGLE Environmental Laboratory to a contract laboratory under the Contract Laboratory program.

### 3.2.9 QA/QC

All samples were collected and analyzed using the field and laboratory quality control procedures prescribed in the SAP. The following paragraphs summarize the field and laboratory quality control procedures utilized during implementation of the SI.

QC samples were collected to evaluate the field sampling methods and the overall reproducibility of the laboratory analytical results. Field duplicate samples were collected, processed, stored, packaged, and analyzed by the same methods as the investigative samples. QC for analytical procedures were performed in accordance with the laboratories' standard operating procedures (SOP).

Matrix spike/matrix spike duplicate (MS/MSD) samples were not collected during the implementation of field activities. Alternatively, MS/MSD samples were selected by the laboratory and "batched". As such, MS/MSD samples were not necessarily derived from investigative samples from the Project, but may have come from another sample set at the laboratory. MS/MSD results were reported with investigative sample results.

The EGLE Environmental Laboratory and their contracted laboratories provided analytical results in electronic data deliverable (EDD) and report formats, with QA/QC data included (case narrative, investigated data results summary, and QC sample summary results). Laboratory-generated data was imported to the Project database for mapping, reporting, and archival activities. Laboratory analytical reports are included in **Appendix G, Laboratory Analytical Reports**.

## 4. EXPOSURE ASSESSMENT

This Section presents the human health and ecological exposure criteria that are applicable to the QMCP. The discussions included in the following subsections assist in framing the results presented in the detailed findings included in **Section 5** through **Section 15** with respect to the current land use and the anticipated future land use within the QMCP.

### 4.1 EGLE FACILITY DEFINITION

As defined in Section 20101(1)(s) of Part 201 of Michigan's Natural Resources and Environmental Protection Act (NREPA), being Public Act (PA) 451 of 1994, as amended, a "Facility" means any area, place, parcel or parcels of property, or portion of a parcel of property where a hazardous substance in excess of the concentrations that satisfy the cleanup criteria for unrestricted residential use has been released, deposited, disposed of, or otherwise comes to be located. Facility does not include any area, place, parcel or parcels of property, or portion of a parcel of property where any of the following conditions are satisfied:

(i) Response activities have been completed under this part or the Comprehensive Environmental Response, Compensation, and Liability Act, 42 United States Code (USC) 9601 to 9675, that satisfy the cleanup criteria for unrestricted residential use.

(ii) Corrective action has been completed under the resource conservation and recovery act, 42 USC 6901 to 6992k, part 111, or part 213 that satisfies the cleanup criteria for unrestricted residential use.

(iii) Site-specific criteria that have been approved by the department for application at the area, place, parcel of property, or portion of a parcel of property are met or satisfied and hazardous substances at the area, place, or property that are not addressed by site-specific criteria satisfy the cleanup criteria for unrestricted residential use.

(iv) Hazardous substances in concentrations above unrestricted residential cleanup criteria are present due only to the placement, storage, or use of beneficial use by-products or inert materials at the area, place, or property in compliance with part 115.

(v) The property has been lawfully split, subdivided, or divided from a facility and does not contain hazardous substances in excess of concentrations that satisfy the cleanup criteria for unrestricted residential use.

(vi) Natural attenuation or other natural processes have reduced concentrations of hazardous substances to levels at or below the cleanup criteria for unrestricted residential use.

Note that in Section 20101(1)(x) of Part 201, hazardous substance does not include by definition stamp sands, which are defined as "finely grained crushed rock resulting from mining, milling, or smelting of copper ore and includes native substances contained within the crushed rock and any ancillary material associated with the crushed rock." Section 20101c goes on to further state that "Property onto which stamp sands have been deposited is not subject to regulation under this part unless the property otherwise contains hazardous substances in excess of concentrations that satisfy the cleanup criteria for unrestricted residential use."

From a terrestrial standpoint, chemical concentrations detected in soil and groundwater in the QMCP exceed residential exposure criteria for one or more COCs. Analytical results and their implications on facility status are described further in the detailed findings in **Section 5** through **Section 14**, which documents portions of the QMCP as being a facility. It should be noted however, that the QMCP is comprised of multiple land parcels and owners.

## 4.2 APPLICABLE SCREENING CRITERIA

In support of developing a comprehensive approach for evaluating risks, the analytical results from previous investigations and this SI were compiled and compared to the following regulatory screening criteria that were in place at the time of Project completion:

- Part 201 of NREPA, being PA 451 of 1994, as amended Residential and Nonresidential Cleanup Criteria for Response Activity (updated, June 25, 2018).
  - Surface Soil;
  - Subsurface Soil;
  - Abandoned Container Contents;
  - RPM;
  - Groundwater; and,
  - Asbestos.
- EPA, National Emission Standards for Hazardous Air Pollutants (NESHAP) (40 CFR, Part 61, Subpart M) (EPA 1984).
  - Asbestos.
- EPA, Region 4, Ecological Screening Values (ESVs) (EPA 2018).
  - Sediment; and,
  - Surface Water.
- EGLE – Rule 57 Water Quality Values, Surface Water Assessment Section (February 2020).
  - Surface Water.
- Sediment Quality Guidelines, Threshold Effect Concentrations (TECs) and Probable Effect Concentrations (PECs) (MacDonald, et al, 2000).
  - Sediment.

It should be noted that while EGLE's Media-Specific Volatilization to Indoor Air Interim Action Screening Levels (MSSLs) were used for screening purposes in evaluating the limits of contamination, they were not used for evaluation of exposure pathway exceedances in the Detailed Findings in **Section 5** through **Section 14**. The EGLE MSSLs are not promulgated rules, and cannot be used for a "Facility" determination, compliance, or for obtaining closure of a release. The regulatory screening criteria summarized above may be applicable to all or select portions of the QMCP. Limiting factors in the assessment of the applicability of these criteria may include, but are not limited to, specific environmental media (as noted above), current and anticipated future land use categories, and relevant exposure pathways for human and ecological receptors. Assessment of these factors requires that the analytical results of the SI and the respective geological and hydrogeological characteristics of the Project area be evaluated to determine generally which exposure pathways, risks, and conditions are relevant and applicable. The following subsections present the criteria assessment rationale and applicability determinations for identified exposure pathways in the QMCP.

#### **4.2.1 Non-Evaluated Exposure Pathways**

The following exposure pathway was not evaluated at the QMCP:

- Risks to aesthetic characteristics of the affected media.

Although contaminated media has the potential to have impacts on aesthetics, this pathway was not assessed because assessment of potential risks to flora, fauna, the food chain, and aesthetics was beyond the scope of the evaluation. The comprehensive evaluation presented in this SI is aimed at determining if a release has occurred and whether or not human health and ecological risks are posed by any such release as they relate to current land use within the QMCP.

#### **4.2.2 Non-Applicable Exposure Pathways**

The following exposure pathways are not applicable at the QMCP:

- Risks due to free-phase liquids.

Free-phase liquids, released to the environment, have not been identified at the QMCP.

#### **4.2.3 Relevant Exposure Pathways Where Applicable Criteria Are Not Exceeded**

The following exposure pathways are relevant at the QMCP, but the maximum detected contaminant concentrations do not exceed applicable exposure criteria:

- Risks posed by hazardous substances in groundwater that may result in flammable or explosive conditions to be present in both residential and nonresidential settings.
- Risks posed by hazardous substances in soil that may result in the volatilization of contaminants to indoor air in nonresidential settings.
- Risks posed by hazardous substances in soil that may result in the volatilization of contaminants to ambient air in residential and nonresidential settings.

#### **4.2.4 Relevant Exposure Pathways Where Criteria Are Exceeded, But Pathway Is Incomplete**

The following exposure pathways are relevant at the QMCP, but the exposure pathway is currently incomplete:

- Risks posed by hazardous substances that are covered or capped with soil and or a vegetative cover.
  - Multiple properties in the QMCP feature capped and vegetated areas along the shoreline of the Portage Canal and Dollar Bay. These properties include vacant and industrial or commercial properties that may or may not have been included in previous remedial actions in the area. Land use on these properties varies, but may include recreational or remain undeveloped. Risks may be present in these areas where cap material has covered potential hazardous materials.

#### 4.2.5 Relevant Exposure Pathways Where Applicable Criteria Are Exceeded and Pathway is Complete

The following exposure pathways are relevant at the QMCP and the exposure pathways are potentially complete:

- Risks posed by hazardous substances in soil and the potential for the substances to leach to groundwater that could be used as a drinking water source in both residential and nonresidential settings.
- Risks posed by hazardous substances in soil and the potential for the substances to leach to groundwater that could vent to surface water.
- Risks posed by hazardous substances in soil and the potential for the substances to be inhaled if they are emitted as particulates and dispersed in ambient air in both residential and nonresidential settings.
- Risks posed by hazardous substances in soil and the potential for direct contact with these soils in both residential and nonresidential settings.
- Risks posed by hazardous substances in soil that may result in the volatilization of contaminants to indoor air in residential settings.
- Risks posed by hazardous substances in groundwater and the potential for that groundwater to be used as a drinking water source in both residential and nonresidential settings.
- Risks posed by hazardous substances in groundwater that may result in the volatilization of contaminants to indoor air in both residential and nonresidential settings.
- Risks posed by hazardous substances in groundwater and the potential for that groundwater to vent to surface water.
- Risks posed by hazardous substances in surface water and sediments that have the potential to have toxic effects on aquatic biota and/or enter the food chain.

Although relevant, EGLE drinking water and groundwater/surface water interface pathway criteria exceedances for metals are excluded from the soil and groundwater evaluation in the detailed findings included in **Section 5** through **Section 14**. The rationale for this exclusion is twofold:

- The Project investigation and anticipated response actions are being undertaken pursuant to Part 201 of Michigan's NREPA, being PA 451 of 1994, as amended. The concentrations of metals in excess of EGLE drinking water and surface water pathway criteria are ubiquitous in the study area and are predominantly the result of the presence of stamp sands. Stamp sands are not defined as a hazardous substance nor are they subject to regulation under Part 201 unless the property otherwise contains hazardous substances in excess of concentrations that satisfy the cleanup criteria for unrestricted residential use; and,
- The study area is part of OU 2 for which the EPA ROD remedy called for No Action. The EPA's ROD for OU 2 includes groundwater, surface water, submerged tailings and sediments in Torch Lake, Portage Lake, the Portage Canal, and other area water bodies. Note that EPA's No Action determination relies on the following to mitigate the effects of stamp sand to the extent practicable:
  - The reduction of stamp sand loading to surface water bodies expected as a result of the remedial action taken at OU 1 and OU 3.
  - Ongoing natural sedimentation and detoxification.

- Institutional programs and practices controlling potential future exposure to site-affected drinking water that were intended to be administered at the county and state level.
- The long-term monitoring and the five-year review process monitoring requirements of the remedy selected for OU 1 and OU 3 under the 1992 ROD.

Note that metals criteria for other relevant pathways, and organic and cyanide contaminants for all pathways were included in the evaluation.

EGLE's MSSLs may be applicable to all or a select portion of QMCP; however, due to limiting factors as discussed in **Section 4.2**, including unknown anticipated future land use and conditions, the screening levels were excluded from the exposure assessment for each subarea. As noted above, the screening levels are not promulgated rules and cannot be used for "Facility" determination or compliance.

#### **4.2.6 Relevant Cleanup Criteria for Hazardous Substances in Contaminated Environmental Media Not Accounted for by Other Rules**

To assure that hazardous substances in contaminated environmental media do not pose unacceptable risks not accounted for by other rules in Part 201, the concentration of a hazardous substance in a given environmental medium shall meet cleanup criteria based on sound scientific principles and determined by EGLE to be necessary to protect the public health, safety, and welfare and the environment.

The following, not accounted for by other rules in this part, are relevant at the QMCP:

- Risks posed by physical hazards.
- Risks posed by hazardous substances in surface soil that may result from the direct transport or runoff of hazardous substances in soil into surface water.
- Risks posed by hazardous substances in waste and abandoned containers that may result from the direct transport or runoff of hazardous substances into soil, groundwater, and surface water.

### **4.3 CONCEPTUAL SITE MODEL**

The applicable regulatory criteria and the relevant exposure pathways assessed in the preceding subsections indicate that COCs are present in various environmental media in the QMCP. COCs have been identified in surface and vadose zone soils, groundwater, pore water, sediment, and submerged drum contents that have the potential to affect human and ecological receptors, as well as recreational users or consumers of the natural resources of the Portage Canal. Further, the potential for particulate migration and dispersion through the air from surface soils poses additional risks.

The current and foreseeable land use in the QMCP includes both residential and nonresidential uses; however, historical documentation indicates that this area was highly industrialized through the 1960s. The extent of these operations included both terrestrial and offshore operations that included the discharge of wastes and debris to the Portage Canal. The eventual end of mining era operations and the generally undocumented transition of these properties to alternative uses likely resulted in the redistribution of surface soils and potentially contaminants along the shoreline. Further, underwater abandoned containers have been visually documented in the nearshore environment. Physical hazards are also posed by residual mining era related conditions.

A Conceptual Site Model (CSM) was developed for the general QMCP to graphically present the relevant exposure pathways summarized in **Section 4.2** and their relationship to the distribution of contaminants in the nearshore (terrestrial and offshore) environment throughout the QMCP. While the CSM was developed for the QMCP, each



individual parcel identified and addressed as part of the SI investigation is unique and may require a property-specific risk assessment based on current and anticipated future land-use. The QMCP CSM represented in **Appendix H**, *Conceptual Site Model – Exposure Pathway Evaluation* depicts these relationships under both residential and nonresidential land use scenarios.

## 5. DETAILED FINDINGS – AREA A

This Section summarizes the results and the subsequent findings for Area A within QMCP derived from implementation of the SAP. The narrative follows the systematic investigative approach outlined in **Section 3**, while providing specific details about the potential human health and ecological risks associated with the historical mining operations in this subarea of QMCP.

### 5.1 SITE INSPECTION AND INVESTIGATION RESULTS

The implementation of the site inspection and investigation activities provided critical lines of evidence that link the historical documentation and the current environmental conditions in and around the Portage Canal. The following subsections present the findings of the inspection and investigation activities and provide correlation of mining era operations and their potential impacts on the nearshore environment of the Portage Canal.

#### 5.1.1 Site Inspection

The site inspection at each subarea included the inventory and locating of historical structures and similar surficial artifacts associated with the former industrial operations in the area. Each subarea was also inspected for potential physical and health hazards that were documented, photographed, and located with a GPS unit. The inventoried hazards were then qualitatively assessed for potential human health and environmental risks to determine if analytical sampling was warranted during the targeted inspection phase of the work.

On September 13, 2018, MSG field team personnel performed reconnaissance activities at Area A. In the cases where access was not requested based on historic operational and investigative findings, property conditions were evaluated from a neighboring property or public right of way where access was permitted. Access to Area A was not requested based on historic operational and investigative findings.

Therefore, the property parcel known as the Houghton County Marina totaling approximately nine acres was visually inspected and observations were recorded from the MDNR trail property. The qualitative assessment of the reconnaissance findings in Area A did not warrant the performance of targeted inspection activities. The following provides a summary of the findings associated with the reconnaissance activities. A summary of identified potentially abandoned containers is provided in **Appendix C, Site Inspections – Reconnaissance Logs, Targeted Inspections & Physical Hazards Inventory**.

##### 5.1.1.1 Reconnaissance

During the reconnaissance activities potentially abandoned containers were observed inside the fence at the Houghton County Marina. Observed contents in open buckets appeared to be used oil. The qualitative assessment of the reconnaissance findings in Area A did not warrant the performance of limited targeted inspection activities.

#### 5.1.2 Site Investigation

The SI in the QMCP was developed based on a variety of data and information as outlined in **Section 3**. In addition to the historical accounts and documentation, current land use and potential exposure pathways were also taken into consideration when selecting the sampling locations specific to Area A. Additional sampling in Area A as part of this SI was not completed; however, proposed investigative locations that were not sampled during the 2018/2019 mobilizations could be completed during future SI activities. A summary of planned investigative locations, sampling rationale, and other relevant information is included on **Table 3-1, Sampling and Analysis Summary** of this SI Report. Detailed summaries of historic soil and groundwater analytical results collected from Area A are provided in **Table 5-1, Summary of Soil Analytical Results (Area A)** and **Table 5-2, Summary of Groundwater Analytical Results (Area A)**,

respectively. Soil and groundwater analytical results are depicted on **Figure 5-1, Soil Analytical Results (Area A)** and **Figure 5-2, Groundwater Analytical Results (Area A)**.

## 5.2 NATURE AND EXTENT OF CONTAMINATION

Utilizing the established regulatory criteria presented in **Section 4** for various land use categories and exposure pathways, the historic laboratory analytical results for Area A were reviewed and compared to the EGLE Cleanup Criteria Requirements for Response Activity as applicable for the sampled environmental media.

### 5.2.1 Comprehensive Exposure Assessment

The comparison was completed to determine which ecological and human exposure pathways, risks, and conditions are relevant in Area A. Although not inclusive of relevant pathways where regulatory criteria were not exceeded, the following exposure pathways were determined to be relevant in Area A:

- Risks posed by hazardous substances in soil and the potential for the substances to leach to groundwater that could be used as a drinking water source in both residential and nonresidential settings.
- Risks posed by hazardous substances in soil and the potential for the substances to leach to groundwater that could vent to surface water.
- Risks posed by hazardous substances in soil that may result in the volatilization of contaminants to indoor air in residential and nonresidential settings.
- Risks posed by hazardous substances in groundwater and the potential for that groundwater to be used as a drinking water source in both residential and nonresidential settings.
- Risks posed by hazardous substances in groundwater that may result in the volatilization of contaminants to indoor air in both residential and nonresidential settings.
- Risks posed by hazardous substances in groundwater and the potential for that groundwater to vent to surface water.
- Risks posed by hazardous substances in groundwater that may exceed solubility limits.

As discussed in **Section 4.2.5**, EGLE drinking water and groundwater/surface water pathway criteria exceedances for metals were excluded from the soil and groundwater evaluation. The rationale for this exclusion is twofold:

- The Project investigation and anticipated response actions are being undertaken pursuant to Part 201 of NREPA, being PA 451 of 1994, as amended. The concentrations of metals in excess of the EGLE drinking water and groundwater/surface water interface pathway criteria are ubiquitous in the study area and are predominantly the result of the presence of stamp sands. Stamp sands are not defined as a hazardous substance nor are subject to regulation under Part 201 unless the property otherwise contains hazardous substances in excess of concentrations that satisfy the cleanup criteria for unrestricted residential use; and,
- The study area is part of OU 2 for which the EPA ROD remedy called for No Action. The EPA's ROD OU 2 includes groundwater, surface water, submerged tailings and sediments in Torch Lake, Portage Lake, the Portage Canal, and other area water bodies. Note that EPA's No Action determination relies on the following to mitigate the effects of stamp sand to the extent practicable:

- The reduction of stamp sand loading to surface water bodies expected as a result of the remedial action taken at OU 1 and OU 3.
- Ongoing natural sedimentation and detoxification.
- Institutional programs and practices controlling potential future exposure to site-affected drinking water which were intended to be administered at the county and state level.
- The long-term monitoring and the five-year review process monitoring requirements of the remedy selected for OU 1 and OU 3 under the 1992 ROD.

Note that metals criteria for other relevant pathways, and cyanide and organic contaminants for all pathways were included in the evaluation.

Furthermore, as discussed in **Section 4.2.5**, EGLE's MSSSLs were not included in the exposure pathway assessment due to unknown anticipated future land use and conditions and because the screening levels are not promulgated rules. The MSSSLs were considered for screening and delineation purposes only.

#### *5.2.1.1 Soil Exposure Pathway Assessment*

Historical soil analytical results from Area A identified COC concentrations in soil that were at or above concentrations that trigger a "Facility" designation as defined in Section 20101(1)(s) of the NREPA. The following tables provide an aggregate summary of the historic soil sample locations with respect to the total number of samples and how they compare to the applicable EGLE Cleanup Criteria for Response Activity under both Residential and Nonresidential exposure scenarios.

The tables are based solely on the total number of samples, inclusive of historical samples, collected from Area A. They list only the number of samples for a specific analytical suite that contained one or more exceedance of a given criterion.

| Soil Analytical Result Summary Table                                 | Cleanup Criteria Requirements for Response Activity – Residential** |                    |                    |                                                |                                                         |                                                       |                                                          |                                          |                                          |                                      |                         |                                                |
|----------------------------------------------------------------------|---------------------------------------------------------------------|--------------------|--------------------|------------------------------------------------|---------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------|------------------------------------------|------------------------------------------|--------------------------------------|-------------------------|------------------------------------------------|
|                                                                      | Analytical Summary                                                  |                    |                    | Groundwater Protection                         |                                                         | Indoor Air                                            | Ambient Air                                              |                                          |                                          |                                      | Contact                 | Csat                                           |
|                                                                      | Total Number of Samples                                             | Detected Analytes* | Total Exceedances* | Residential Drinking Water Protection Criteria | Groundwater Surface Water Interface Protection Criteria | Soil Volatilization to Indoor Air Inhalation Criteria | Infinite Source Volatile Soil Inhalation Criteria (VSIC) | Finite VSIC for 5 Meter Source Thickness | Finite VSIC for 2 Meter Source Thickness | Particulate Soil Inhalation Criteria | Direct Contact Criteria | Soil Saturation Concentration Screening Levels |
| Inorganics                                                           | 4                                                                   | 76                 | 0                  | NA*                                            | NA*                                                     | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Cyanide                                                              | 4                                                                   | 3                  | 1                  | 0                                              | 1                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| VOCs                                                                 | 20                                                                  | 13                 | 0                  | 0                                              | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| SVOCs                                                                | 21                                                                  | 57                 | 3                  | 0                                              | 2                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Asbestos                                                             | 0                                                                   | 0                  | 0                  | 0                                              | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Total PCBs                                                           | 4                                                                   | 0                  | 0                  | 0                                              | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Pesticides                                                           | 4                                                                   | 13                 | 0                  | 0                                              | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| COCs exceeding applicable regulatory criteria in one or more samples |                                                                     |                    |                    | CYANIDE, NAPHTHALENE (SVOC), PHENANTHRENE      |                                                         |                                                       |                                                          |                                          |                                          |                                      |                         |                                                |

NA\* = The EGLE drinking water and groundwater/surface water interface pathway criteria exceedances for metals are excluded from the soil evaluation as explained in Section 4.2.5.

\*Denotes total number of specific instances of an analyte being detected or exceeding criteria, can be multiple within one sample location.

\*\*Denotes total number of samples exceeding criteria, cannot be multiple within one sample location.

Total exceedance column does not include MSSLS or non-applicable criteria (DWPC and GSIPC for metals).

| Soil Analytical Result Summary Table                                 | Cleanup Criteria Requirements for Response Activity – Nonresidential** |                    |                    |                                                   |                                                         |                                                       |                                                          |                                          |                                          |                                      |                         |                                                |
|----------------------------------------------------------------------|------------------------------------------------------------------------|--------------------|--------------------|---------------------------------------------------|---------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------|------------------------------------------|------------------------------------------|--------------------------------------|-------------------------|------------------------------------------------|
|                                                                      | Analytical Summary                                                     |                    |                    | Groundwater Protection                            |                                                         | Indoor Air                                            | Ambient Air                                              |                                          |                                          |                                      | Contact                 | Csat                                           |
|                                                                      | Total Number of Samples                                                | Detected Analytes* | Total Exceedances* | Nonresidential Drinking Water Protection Criteria | Groundwater Surface Water Interface Protection Criteria | Soil Volatilization to Indoor Air Inhalation Criteria | Infinite Source Volatile Soil Inhalation Criteria (VSIC) | Finite VSIC for 5 Meter Source Thickness | Finite VSIC for 2 Meter Source Thickness | Particulate Soil Inhalation Criteria | Direct Contact Criteria | Soil Saturation Concentration Screening Levels |
| Inorganics                                                           | 4                                                                      | 76                 | 0                  | NA*                                               | NA*                                                     | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Cyanide                                                              | 4                                                                      | 3                  | 1                  | 0                                                 | 1                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| VOCs                                                                 | 20                                                                     | 13                 | 0                  | 0                                                 | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| SVOCs                                                                | 21                                                                     | 57                 | 3                  | 0                                                 | 2                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Asbestos                                                             | 0                                                                      | 0                  | 0                  | 0                                                 | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Total PCBs                                                           | 4                                                                      | 0                  | 0                  | 0                                                 | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Pesticides                                                           | 4                                                                      | 13                 | 0                  | 0                                                 | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| COCs exceeding applicable regulatory criteria in one or more samples |                                                                        |                    |                    | CYANIDE, NAPHTHALENE (SVOC), PHENANTHRENE         |                                                         |                                                       |                                                          |                                          |                                          |                                      |                         |                                                |

NA\* = The EGLE drinking water and groundwater/surface water interface pathway criteria exceedances for metals are excluded from the soil evaluation as explained in Section 4.2.5.

\*Denotes total number of specific instances of an analyte being detected or exceeding criteria, can be multiple within one sample location.

\*\*Denotes total number of samples exceeding criteria, cannot be multiple within one sample location.

Total exceedance column does not include MSSLS or non-applicable criteria (DWPC and GSIPC for metals).

#### 5.2.1.2 Groundwater Exposure Pathway Assessment

Groundwater analytical results from Area A identified COC concentrations in groundwater that were at or above concentrations that trigger a “Facility” designation as defined in Section 20101(1)(s) of the NREPA. Similar to the preceding soil tables, the following table provides a summary of the aforementioned sample locations with respect to the total number of samples and how they compare to the applicable EGLE Cleanup Criteria for Response Activity under both Residential and Nonresidential exposure scenarios.

| Groundwater Analytical Result Summary Table                          | Analytical Summary      |                                    |                    | Cleanup Criteria Requirements for Response Activity – Residential and Nonresidential**                                                                                                                          |                                        |                                              |                                                                          |                                                                             |                  |                                               |
|----------------------------------------------------------------------|-------------------------|------------------------------------|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|----------------------------------------------|--------------------------------------------------------------------------|-----------------------------------------------------------------------------|------------------|-----------------------------------------------|
|                                                                      | Total Number of Samples | Total Number of Detected Analytes* | Total Exceedances* | Residential Drinking Water Criteria                                                                                                                                                                             | Nonresidential Drinking Water Criteria | Groundwater Surface Water Interface Criteria | Residential Groundwater Volatilization to Indoor Air Inhalation Criteria | Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria | Water Solubility | Flammability and Explosivity Screening Levels |
| Inorganics                                                           | 1                       | 1                                  | 0                  | NA*                                                                                                                                                                                                             | NA*                                    | NA*                                          | 0                                                                        | 0                                                                           | 0                | 0                                             |
| Cyanide                                                              | 0                       | 0                                  | 0                  | 0                                                                                                                                                                                                               | 0                                      | 0                                            | 0                                                                        | 0                                                                           | 0                | 0                                             |
| VOCs                                                                 | 24                      | 9                                  | 4                  | 2                                                                                                                                                                                                               | 2                                      | 1                                            | 0                                                                        | 0                                                                           | 0                | 0                                             |
| SVOCs                                                                | 18                      | 17                                 | 14                 | 1                                                                                                                                                                                                               | 1                                      | 3                                            | 1                                                                        | 1                                                                           | 1                | 0                                             |
| Total PCBs                                                           | 0                       | 0                                  | 0                  | 0                                                                                                                                                                                                               | 0                                      | 0                                            | 0                                                                        | 0                                                                           | 0                | 0                                             |
| Pesticides                                                           | 0                       | 0                                  | 0                  | 0                                                                                                                                                                                                               | 0                                      | 0                                            | 0                                                                        | 0                                                                           | 0                | 0                                             |
| Chloride                                                             | 1                       | 1                                  | 1                  | 0                                                                                                                                                                                                               | 0                                      | 1                                            | 0                                                                        | 0                                                                           | 0                | 0                                             |
| COCs exceeding applicable regulatory criteria in one or more samples |                         |                                    |                    | BENZENE, ETHYLBENZENE, XYLENE - TOTAL, ACENAPHTHENE, ANTHRACENE, BENZO(A)ANTHRACENE, BENZO(A)PYRENE, BENZO(B)FLUORANTHENE, CHRYSENE, FLUORANTHENE, FLUORENE, NAPHTHALENE (SVOC), PHENANTHRENE, PYRENE, CHLORIDE |                                        |                                              |                                                                          |                                                                             |                  |                                               |

NA\* = The EGLE drinking water and groundwater/surface water interface pathway criteria exceedances for metals are excluded from the groundwater evaluation as explained in Section 4.2.5.

\*Denotes total number of specific instances of an analyte being detected or exceeding criteria, can be multiple within one sample location.

\*\*Denotes total number of samples exceeding criteria, cannot be multiple within one sample location.

Total exceedance column does not include MSSSLs or non-applicable criteria (DWC and GSIC for metals).

## 5.2.2 Extent of Contamination

The comparison of analytical results to applicable regulatory criteria indicates that potential human health and ecological risks are present in soil and groundwater at Area A. Recalling the goals and objectives of the SI, the following subsections describe the extent of contamination in environmental media in the study area.

### 5.2.2.1 Soil Extent of Contamination

Historical soil analytical results from Area A identified COC concentrations in soil that were at or above concentrations that trigger a “Facility” designation as defined in Section 20101(1)(s) of the NREPA.

Historic soil analytical results exceeded Groundwater/Surface Water Interface Protection Criteria (GSIPC), and/or soil MSSSLs for residential and/or nonresidential exposure scenarios in six samples. The predominant contaminants were SVOCs, VOCs, and some inorganic compounds, including cyanide and mercury.

Most historic samples were collected from surface and subsurface soil intervals in areas that are generally accessible to the public, including on MDNR trail property. The sampling locations were generally within approximately 250 ft of the shoreline of the Portage Canal.

Soils with elevated levels of inorganic COCs are ubiquitous in the area, which becomes a limiting factor when evaluating potential exposure pathways. In the case of Area A, elevated concentrations of inorganic and organic contaminants potentially include exposure risks related to inhalation pathways, which must be a consideration when evaluating land use, property accessibility, and the extent of contamination in surface and near surface soils that could be encountered through normal use of the property.

The remaining exposure risks are generally related to the leaching of contaminants to groundwater and their potential impacts on drinking water (if used as a drinking water source) and surface water. These risks pose a long-term threat to the overall environmental health of the watershed. The widespread distribution of inorganic COCs throughout the region limits determinations related to the extent of contamination in Area A. Nevertheless, risks posed to groundwater and surface water are relevant and are a factor when evaluating the extent of soil contamination in the QMCP.

#### *5.2.2.2 Groundwater Extent of Contamination*

Historic groundwater analytical results at certain locations exceeded Drinking Water Criteria (DWC) for both residential and nonresidential exposure scenarios, and Groundwater/Surface Water Criteria (GSIC) for primarily organic contaminants. In addition, SVOCs and/or VOCs exceeded Groundwater Volatilization to Indoor Air Criteria (VIAC) and/or MSSLs at four of the sampled locations. Review of historic documentation indicated analysis for PCBs did not occur and only one sample was analyzed for inorganic constituents (lead). Water solubility criteria was exceeded at one historic location (MW-113), indicating the potential for light-non aqueous phase liquids (LNAPL) which has not been identified or defined.

Groundwater sample intervals and monitoring well depths were not available for evaluation; however, near-shore sample locations are assumed to generally have a shallow water table.

The potential risks associated with groundwater as a drinking water source as well as its connectivity to nearby surface water bodies should be a consideration in determinations related to the extent of contamination in Area A.

### **5.3 CONCLUSIONS AND RECOMMENDATIONS**

The analytical results and interpretation summarized in the preceding subsections document potential human health and ecological risks that are present in Area A. The following subsections provide a synopsis of these findings and a recommended path forward for addressing these risks in Area A.

#### **5.3.1 Conclusions**

Environmental impacts in Area A are generally characterized by detections of organic and inorganic contaminants in soil and groundwater. Although specific sources of these contaminants may not be fully understood, research related to the historical operations provided substantive evidence for assessing specific operational areas and selecting target analytes anticipated to be present within the study area.

The historic analytical results summarized above provide sufficient analytical data and lines of evidence to conclude that the study area is a Facility as defined in Section 20101(1)(s) of the NREPA. The following table provides a summary of the affected environmental media, applicable regulatory criteria, and potential receptors within Area A.



| Area A – Media, Criteria, Potential Receptor Summary                 |                           |                                     |                |                                                                                                                                                                                                                          |                                     |                              |                |                        |            |               |              |                                                        |                              |               |
|----------------------------------------------------------------------|---------------------------|-------------------------------------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|------------------------------|----------------|------------------------|------------|---------------|--------------|--------------------------------------------------------|------------------------------|---------------|
| Media                                                                | Soil                      |                                     |                | Groundwater                                                                                                                                                                                                              |                                     |                              | Air            |                        | Sediment   | Surface Water |              | Building Materials, Asbestos, and Abandoned Containers |                              |               |
| Criteria                                                             | Drinking Water Protection | Groundwater Surface Water Interface | Direct Contact | Drinking Water Protection                                                                                                                                                                                                | Groundwater Surface Water Interface | Flammability and Explosivity | Volatilization | Particulate Inhalation | Ecological | Ecological    | Human Health | Particulate Inhalation                                 | Flammability and Explosivity | Environmental |
| Potential Receptor                                                   |                           |                                     |                |                                                                                                                                                                                                                          |                                     |                              |                |                        |            |               |              |                                                        |                              |               |
| Residential Human                                                    |                           | ✓                                   |                | ✓                                                                                                                                                                                                                        | ✓                                   |                              | ✓              |                        |            |               |              |                                                        |                              |               |
| Nonresidential Human                                                 |                           | ✓                                   |                | ✓                                                                                                                                                                                                                        | ✓                                   |                              | ✓              |                        |            |               |              |                                                        |                              |               |
| Water Column Organism                                                |                           |                                     |                |                                                                                                                                                                                                                          |                                     |                              |                |                        |            |               |              |                                                        |                              |               |
| Benthic Organism                                                     |                           |                                     |                |                                                                                                                                                                                                                          |                                     |                              |                |                        |            |               |              |                                                        |                              |               |
| COCs exceeding applicable regulatory criteria in one or more samples |                           |                                     |                | BENZENE, ETHYLBENZENE, XYLENE - TOTAL, ACENAPHTHENE, ANTHRACENE, BENZO(A)ANTHRACENE, BENZO(A)PYRENE, BENZO(B)FLUORANTHENE, CHRYSENE, FLUORANTHENE, FLUORENE, NAPHTHALENE (SVOC), PHENANTHRENE, PYRENE, CYANIDE, CHLORIDE |                                     |                              |                |                        |            |               |              |                                                        |                              |               |

The following provides a summary of findings derived from the assessment of Area A with respect to the goals and objectives for the Project:

- Terrestrial sources of contamination are present in the form of inorganic COCs, cyanide, VOCs, and SVOCs in the study area. The analytical data is historic, the extent of contamination in Area A has not been fully defined or addressed, and the potential for LNAPL near MW-113 has not been investigated.
- Soil impacts on the MDNR trail property exceeded GSI PC and MSSSLs for residential and nonresidential scenarios but did not exceed particulate soil inhalation criteria (PSIC) or DCC.

### 5.3.2 Recommendations

The conclusions outlined in the preceding subsection establish that Area A is a Part 201 Facility. Section 20107a of Part 201 of NREPA describes the duties of owners or operators of a Facility, regardless of their liability, including: prevent unacceptable exposures, prevent exacerbation, and take reasonable precautions against the foreseeable actions of third parties. Some exceptions may apply; in any case, owners and operators of contaminated properties should become familiar with Section 20107a and the associated Rules.

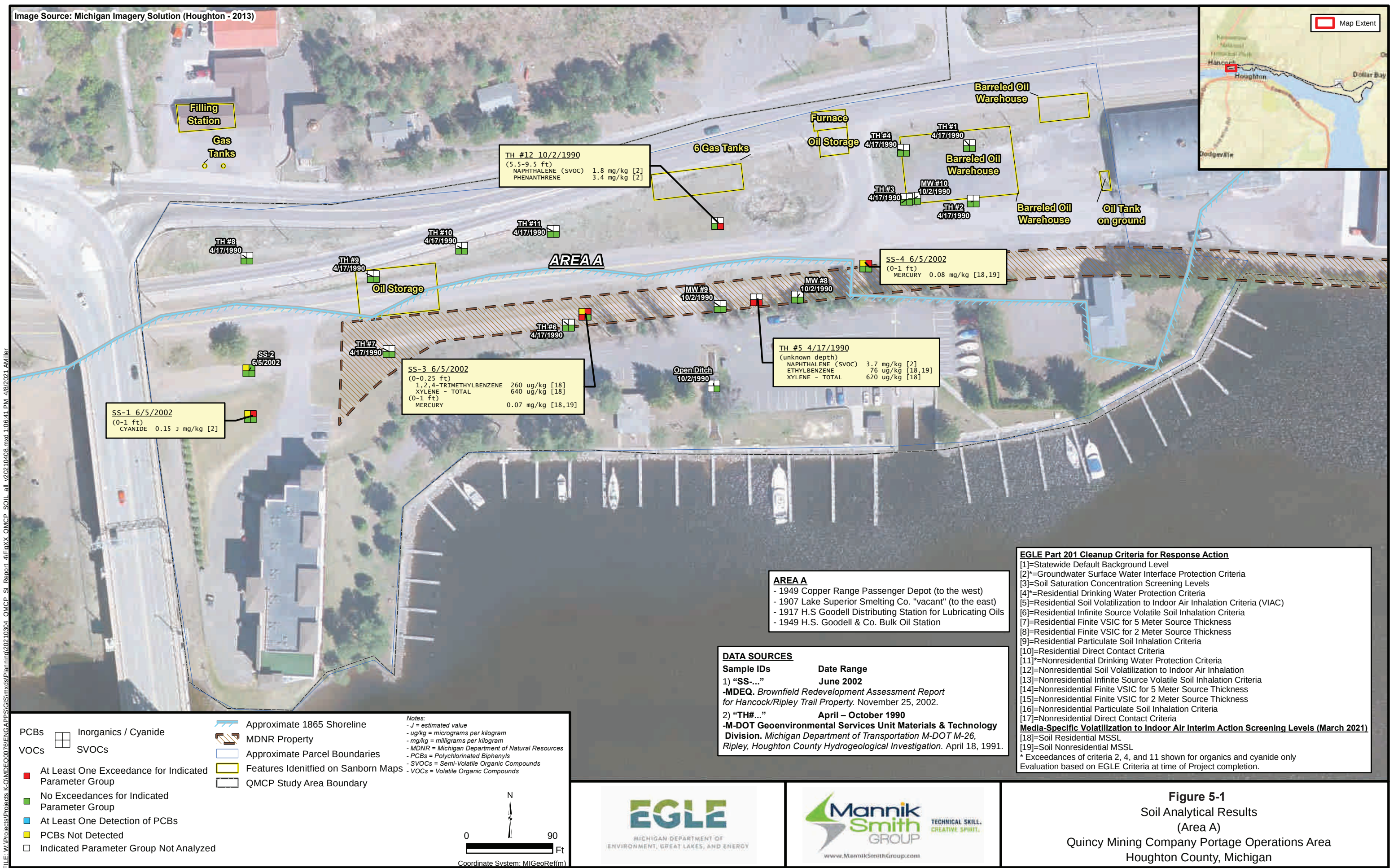
## FIGURES

### DETAILED FINDINGS REPORT – AREA A

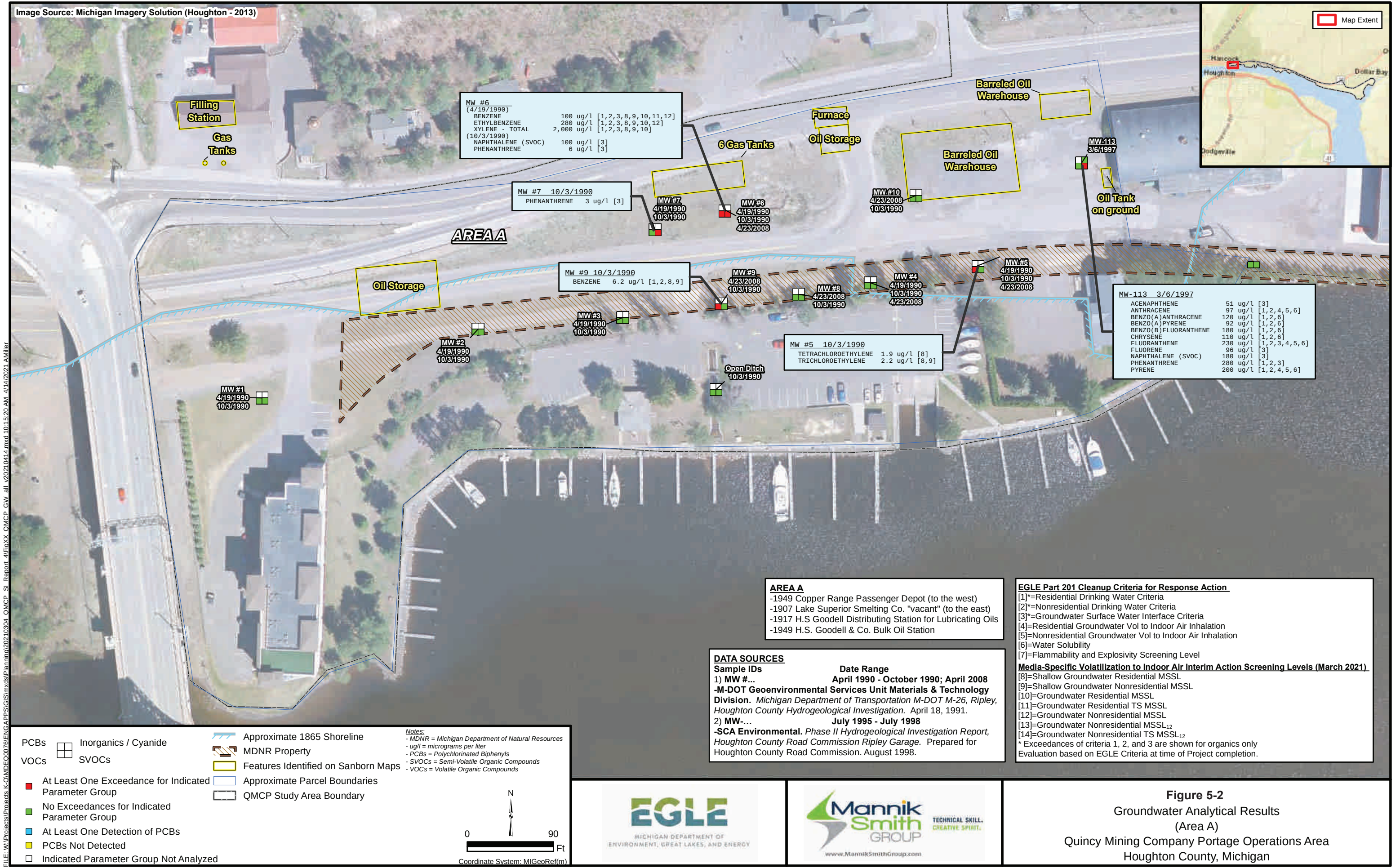




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## TABLES

### DETAILED FINDINGS REPORT – AREA A



**TABLE 5-1**  
**Summary of Soil Analytical Results**  
**Area A**

| Location Code                |            | EGLE Part 201 Generic Cleanup Criteria                         |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |           | Area A    |           |           |           |           |           |           |           |           |           |           |         |         |         |         |         |         |         |         |         |         |  |  |  |  |  |  |  |
|------------------------------|------------|----------------------------------------------------------------|-------------------------------------------------------|---------------------------------------------------------------------------------|---------------------------------------------------------|---------------------------------------------|-----------------------------------------------------------|-------------------------------------------------------------|------------------------------------------------|-------------------------------|-----------------------------------------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|--|--|--|--|--|--|
| Station Name                 | CAS Number | [2]<br>Groundwater Surface Water Interface Protection Criteria | [4]<br>Residential Drinking Water Protection Criteria | [5]<br>Residential Soil Volatilization to Indoor Air Inhalation Criteria (VSIC) | [9]<br>Residential Particulate Soil Inhalation Criteria | [10]<br>Residential Direct Contact Criteria | [11]<br>Nonresidential Drinking Water Protection Criteria | [16]<br>Nonresidential Particulate Soil Inhalation Criteria | [17]<br>Nonresidential Direct Contact Criteria | [18]<br>Soil Residential MSSL | [19]<br>Soil Nonresidential MSSL                                            | TH #1     |           | TH #2     |           | TH #3     |           | TH #4     |           | TH #5     |           | TH #6     |           | TH #7   |         | TH #8   |         | TH #9   |         | TH #10  |         | TH #11  |         |  |  |  |  |  |  |  |
| Field Sample ID              |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             | TH #1     | TH #2     | TH #3     | TH #3     | TH #4     | TH #5     | TH #6     | TH #7     | TH #8     | TH #9     | TH #10    | TH #11    |         |         |         |         |         |         |         |         |         |         |  |  |  |  |  |  |  |
| Sample Date                  |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             | 4/17/1990 | 4/17/1990 | 4/17/1990 | 4/17/1990 | 4/17/1990 | 4/17/1990 | 4/17/1990 | 4/17/1990 | 4/17/1990 | 4/17/1990 | 4/17/1990 | 4/17/1990 |         |         |         |         |         |         |         |         |         |         |  |  |  |  |  |  |  |
| Sample Interval (bgs)        |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             | --        | --        | 0 - 4 ft  | 4 - 8 ft  | --        | --        | --        | --        | --        | --        | --        | --        |         |         |         |         |         |         |         |         |         |         |  |  |  |  |  |  |  |
| Sample Description           |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             | --        | --        | --        | --        | --        | --        | --        | --        | --        | --        | --        | --        |         |         |         |         |         |         |         |         |         |         |  |  |  |  |  |  |  |
|                              |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             | Result    | Exceeds   | Result    | Exceeds   | Result    | Exceeds   | Result    | Exceeds   | Result    | Exceeds   | Result    | Exceeds   | Result  | Exceeds | Result  | Exceeds | Result  | Exceeds | Result  | Exceeds | Result  | Exceeds |  |  |  |  |  |  |  |
| Inorganics - Metals (mg/kg)  |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             |           |           |           |           |           |           |           |           |           |           |           |           |         |         |         |         |         |         |         |         |         |         |  |  |  |  |  |  |  |
| ALUMINUM                     | 7429-90-5  | NA                                                             | 6900 (B)                                              | NLV                                                                             | ID                                                      | 50,000 (D,BB)                               | 6,900 (B)                                                 | ID                                                          | 3.7E+5 (D,BB)                                  | NA                            | NA                                                                          | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM      | --      | NM      | --      | NM      | --      | NM      | --      | NM      | --      |  |  |  |  |  |  |  |
| ANTIMONY                     | 7440-36-0  | 1.2 (X)                                                        | 4.3                                                   | NLV                                                                             | 13,000                                                  | 180                                         | 4.3                                                       | 5,900                                                       | 670                                            | NA                            | NA                                                                          | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM      | --      | NM      | --      | NM      | --      | NM      | --      | NM      | --      |  |  |  |  |  |  |  |
| ARSENIC                      | 7440-38-2  | 4.6                                                            | 4.6                                                   | NLV                                                                             | 720                                                     | 7.6                                         | 4.6                                                       | 910                                                         | 37                                             | NA                            | NA                                                                          | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM      | --      | NM      | --      | NM      | --      | NM      | --      | NM      | --      |  |  |  |  |  |  |  |
| BARIUM                       | 7440-39-3  | 130 (B,G)                                                      | 1,300 (B)                                             | NLV                                                                             | 3.3E+5 (B)                                              | 37,000 (B)                                  | 1,300 (B)                                                 | 1.5E+5 (B)                                                  | 1.3E+5 (B)                                     | NA                            | NA                                                                          | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM      | --      | NM      | --      | NM      | --      | NM      | --      | NM      | --      |  |  |  |  |  |  |  |
| BERYLLIUM                    | 7440-41-7  | 24 (G)                                                         | 51                                                    | NLV                                                                             | 1,300                                                   | 410                                         | 51                                                        | 590                                                         | 1,600                                          | NA                            | NA                                                                          | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM      | --      | NM      | --      | NM      | --      | NM      | --      | NM      | --      |  |  |  |  |  |  |  |
| CADMIUM                      | 7440-43-9  | 1.6 (B,G,X)                                                    | 6.0 (B)                                               | NLV                                                                             | 1,700 (B)                                               | 550 (B)                                     | 6.0 (B)                                                   | 2,200 (B)                                                   | 2,100 (B)                                      | NA                            | NA                                                                          | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM      | --      | NM      | --      | NM      | --      | NM      | --      | NM      | --      |  |  |  |  |  |  |  |
| CALCIUM                      | 7440-70-2  | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM      | --      | NM      | --      | NM      | --      | NM      | --      | NM      | --      |  |  |  |  |  |  |  |
| CHROMIUM                     | 7440-47-3  | 1.2E+6 (B,G,H,X)                                               | 1.0E+6 (B,D,H)                                        | NLV                                                                             | 3.30E+8 (B,H)                                           | 7.90E+5 (B,H)                               | 1.00E+6 (B,D,H)                                           | 1.50E+5 (B,H)                                               | 1.00E+6 (B,D,H)                                | NA                            | NA                                                                          | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM      | --      | NM      | --      | NM      | --      | NM      | --      | NM      | --      |  |  |  |  |  |  |  |
| COBALT                       | 7440-48-4  | 2                                                              | 0.8                                                   | NLV                                                                             | 13,000                                                  | 2,600                                       | 2                                                         | 5,900                                                       | 9,000                                          | NA                            | NA                                                                          | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM      | --      | NM      | --      | NM      | --      | NM      | --      | NM      | --      |  |  |  |  |  |  |  |
| COPPER                       | 7440-50-8  | 32 (B,G)                                                       | 5,800 (B)                                             | NLV                                                                             | 130,000 (B)                                             | 20,000 (B)                                  | 5,800 (B)                                                 | 59,000 (B)                                                  | 73,000 (B)                                     | NA                            | NA                                                                          | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM      | --      | NM      | --      | NM      | --      | NM      | --      | NM      | --      |  |  |  |  |  |  |  |
| IRON                         | 7439-89-6  | --                                                             | 12,000 (B)                                            | NLV                                                                             | ID                                                      | 160,000 (B)                                 | 12,000 (B)                                                | ID                                                          | 580,000 (B)                                    | NA                            | NA                                                                          | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM      | --      | NM      | --      | NM      | --      | NM      | --      | NM      | --      |  |  |  |  |  |  |  |
| LEAD                         | 7439-92-1  | 2,500 (B,G,X)                                                  | 700 (B)                                               | NLV                                                                             | 100,000 (B)                                             | 400 (B)                                     | 700 (B)                                                   | 44,000 (B)                                                  | 900 (B,DD)                                     | NA                            | NA                                                                          | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM      | --      | NM      | --      | NM      | --      | NM      | --      | NM      | --      |  |  |  |  |  |  |  |
| LITHIUM                      | 7439-93-2  | 9.8 (B)                                                        | 9.8 (B)                                               | NLV                                                                             | 2.30E+9 (B)                                             | 4,200 (B,DD)                                | 9.8 (B)                                                   | 1.00E+6 (B)                                                 | 31,000 (B,DD)                                  | NA                            | NA                                                                          | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM      | --      | NM      | --      | NM      | --      | NM      | --      | NM      | --      |  |  |  |  |  |  |  |
| MAGNESIUM                    | 7439-95-4  | --                                                             | 8,000 (B)                                             | NLV                                                                             | 6.70E+6 (B)                                             | 1.0E+9 (B,D)                                | 22,000 (B)                                                | 2.90E+6 (B)                                                 | 1.00E+6 (B,D)                                  | NA                            | NA                                                                          | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM      | --      | NM      | --      | NM      | --      | NM      | --      | NM      | --      |  |  |  |  |  |  |  |
| MANGANESE                    | 7439-96-5  | 440 (B,G,X)                                                    | 440 (B)                                               | NLV                                                                             | 3,300 (B)                                               | 25,000 (B)                                  | 440 (B)                                                   | 1,500 (B)                                                   | 90,000 (B)                                     | NA                            | NA                                                                          | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM      | --      | NM      | --      | NM      | --      | NM      | --      | NM      | --      |  |  |  |  |  |  |  |
| MERCURY                      | 7439-97-6  | 0.13 (B,Z)                                                     | 1.7 (B,Z)                                             | 48 (B,Z)                                                                        | 20,000 (B,Z)                                            | 160 (B,Z)                                   | 1.7 (B,Z)                                                 | 8,800 (B,Z)                                                 | 580 (B,Z)                                      | 0.022 (M)                     | 0.066                                                                       | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM      | --      | NM      | --      | NM      | --      | NM      | --      | NM      | --      |  |  |  |  |  |  |  |
| NICKEL                       | 7440-02-0  | 29 (G)                                                         | 100 (B)                                               | NLV                                                                             | 13,000 (B)                                              | 40,000 (B)                                  | 100 (B)                                                   | 16,000 (B)                                                  | 1.50E+5 (B)                                    | NA                            | NA                                                                          | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM      | --      | NM      | --      | NM      | --      | NM      | --      | NM      | --      |  |  |  |  |  |  |  |
| POTASSIUM                    | 7440-09-7  | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM      | --      | NM      | --      | NM      | --      | NM      | --      | NM      | --      |  |  |  |  |  |  |  |
| SELENIUM                     | 7782-49-2  | 0.41 (B)                                                       | 4.0 (B)                                               | NLV                                                                             | 130,000 (B)                                             | 2,600 (B)                                   | 4.0 (B)                                                   | 59,000 (B)                                                  | 9,600 (B)                                      | NA                            | NA                                                                          | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM      | --      | NM      | --      | NM      | --      | NM      | --      | NM      | --      |  |  |  |  |  |  |  |
| SILVER                       | 7440-22-4  | 1.0 (B,M)                                                      | 4.5 (B)                                               | NLV                                                                             | 6700 (B)                                                | 2500 (B)                                    | 13 (B)                                                    | 2,900 (B)                                                   | 9,000 (B)                                      | NA                            | NA                                                                          | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM      | --      | NM      | --      | NM      | --      | NM      | --      | NM      | --      |  |  |  |  |  |  |  |
| SODIUM                       | 7440-23-5  | NA                                                             | 4,600                                                 | NLV                                                                             | ID                                                      | 1.0E+6 (D)                                  | NA                                                        | ID                                                          | 1.0E+6 (D)                                     | NA                            | NA                                                                          | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM      | --      | NM      | --      | NM      | --      | NM      | --      | NM      | --      |  |  |  |  |  |  |  |
| VANADIUM                     | 7440-62-2  | 430                                                            | 72                                                    | NLV                                                                             | ID                                                      | 750 (DD)                                    | 990                                                       | ID                                                          | 5,500 (DD)                                     | NA                            | NA                                                                          | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM      | --      | NM      | --      | NM      | --      | NM      | --      | NM      | --      |  |  |  |  |  |  |  |
| ZINC                         | 7440-66-6  | 62 (B,G)                                                       | 2,400 (B)                                             | NLV                                                                             | ID                                                      | 1.70E+5 (B)                                 | 5,000 (B)                                                 | ID                                                          | 6.30E+5 (B)                                    | NA                            | NA                                                                          | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM      | --      | NM      | --      | NM      | --      | NM      | --      | NM      | --      |  |  |  |  |  |  |  |
| Inorganics - Cyanide (mg/kg) |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             |           |           |           |           |           |           |           |           |           |           |           |           |         |         |         |         |         |         |         |         |         |         |  |  |  |  |  |  |  |
| CYANIDE                      | 57-12-5    | 0.1 (P,R)                                                      | 4.0 (P,R)                                             | NLV                                                                             | 250 (P,R)                                               | 12 (P,R)                                    | 4.0 (P,R)                                                 | 250 (P,R)                                                   | 250 (P,R)                                      | NA                            | NA                                                                          | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM      | --      | NM      | --      | NM      | --      | NM      | --      | NM      | --      |  |  |  |  |  |  |  |
| Organics - PCBs (ug/kg)      |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             |           |           |           |           |           |           |           |           |           |           |           |           |         |         |         |         |         |         |         |         |         |         |  |  |  |  |  |  |  |
| AROCOR-1260                  | 11096-82-5 | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM      | --      | NM      | --      | NM      | --      | NM      | --      | NM      | --      |  |  |  |  |  |  |  |
| AROCOR-1262                  | 37324-23-5 | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM      | --      | NM      | --      | NM      | --      | NM      | --      | NM      | --      |  |  |  |  |  |  |  |
| TOTAL PCBs                   | 1336-36-6  | NLL                                                            | NLL                                                   | 3.00E+6 (J,T)                                                                   | 5.20E+6 (J,T)                                           | 1,000 (J,T)                                 | NLL                                                       | 6.50E+6 (J,T)                                               | 1,000 (J,T)                                    | NA                            | NA                                                                          | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM      | --      | NM      | --      | NM      | --      | NM      | --      | NM      | --      |  |  |  |  |  |  |  |
| Organics - SVOCs (ug/kg)     |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             |           |           |           |           |           |           |           |           |           |           |           |           |         |         |         |         |         |         |         |         |         |         |  |  |  |  |  |  |  |
| 1,1-BIPHENYL                 | 92-52-4    | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM      | --      | NM      | --      | NM      | --      | NM      | --      | NM      | --      |  |  |  |  |  |  |  |
| 2-METHYLNAPHTHALENE (SVOC)   | 91-57-6S   | 4,200                                                          | 57,000                                                | 2.70E+06                                                                        | 6.70E+08                                                | 8.10E+06                                    | 1.70E+05                                                  | 2.90E+08                                                    | 2.60E+07                                       | NA                            | NA                                                                          | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM      | --      | NM      | --      | NM      | --      | NM      | --      | NM      | --      |  |  |  |  |  |  |  |
| ACENAPHTHENE                 | 83-32-9    | 8,700                                                          | 3.00E+05                                              | 1.90E+08                                                                        | 1.40E+10                                                | 4.10E+07                                    | 8.80E+05                                                  | 6.20E+09                                                    | 1.30E+08                                       | NA                            | NA                                                                          | <200 U    | --        | <200 U    | --        | <200 U    | --        | <200 U    | --        | <200 U    | --        | <200 U    | --        | <200 U  | --      | <200 U  | --      | <200 U  | --      | <200 U  | --      | <200 U  | --      |  |  |  |  |  |  |  |
| ACENAPHTHYLENE               | 208-96-8   | ID                                                             | 5,900                                                 | 1.60E+06                                                                        | 2.30E+09                                                | 1.60E+06                                    | 17,000                                                    | 1.00E+09                                                    | 5.20E+06                                       | NA                            | NA                                                                          | <100 U    | --        | <100 U    | --        | <100 U    | --        | <100 U    | --        | <100 U    | --        | <100 U    | --        | <100 U  | --      | <100 U  | --      | <100 U  | --      | <100 U  | --      | <100 U  | --      |  |  |  |  |  |  |  |
| ACETOPHENONE                 | 98-86-2    | ID                                                             | 30,000                                                | 1.20E+8 (C)                                                                     | 3.30E+10                                                | 4.70E+7 (C)                                 | 88,000                                                    | 1.40E+10                                                    | 1.50E+8 (C)                                    | NA                            | NA                                                                          | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM      | --      | NM      | --      | NM      | --      | NM      | --      | NM      | --      |  |  |  |  |  |  |  |
| ANTHRACENE                   | 120-12-7   | ID                                                             | 41,000                                                | 1.00E+9 (D)                                                                     | 6.70E+10                                                | 2.30E+08                                    | 41,000                                                    | 2.90E+10                                                    | 7.30E+08                                       | NA                            | NA                                                                          | <100 U    | --        | <100 U    | --        | <100 U    | --        | <100 U    | --        | 220       | --        | <100 U    | --        | <100 U  | --      | <100 U  | --      | 180     | --      | <100 U  | --      | <100 U  | --      |  |  |  |  |  |  |  |
| BENZALDEHYDE                 | 100-52-7   | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM      | --      | NM      | --      | NM      | --      | NM      | --      | NM      | --      |  |  |  |  |  |  |  |
| BENZO(A)ANTHRACENE           | 56-55-3    | NLL                                                            | NLL                                                   | NLV                                                                             | ID                                                      | 20,000 (Q)                                  | NLL                                                       | ID                                                          | 80,000 (Q)                                     | NA                            | NA                                                                          | <500 U    | --        | <500 U    | --        | <500 U    | --        | <500 U    | --        | <500 U    | --        | <500 U    | --        | <500 U  | --      | <500 U  | --      | <500 U  | --      | <500 U  | --      | <500 U  | --      |  |  |  |  |  |  |  |
| BENZO(A)PYRENE               | 50-32-8    | NLL                                                            | NLL                                                   | NLV                                                                             | 1.50E+8 (Q)                                             | 2,000 (Q)                                   | NLL                                                       | 1.90E+6 (Q)                                                 | 8,000 (Q)                                      | NA                            | NA                                                                          | <500 U    | --        | <500 U    | --        | <500 U    | --        | <500 U    | --        | <500 U    | --        | <500 U    | --        | <500 U  | --      | <500 U  | --      | <500 U  | --      | <500 U  | --      | <500 U  | --      |  |  |  |  |  |  |  |
| BENZO(B)FLUORANTHENE         | 205-99-2   | NLL                                                            | NLL                                                   | ID                                                                              | ID                                                      | 20,000 (Q)                                  | NLL                                                       | ID                                                          | 80,000 (Q)                                     | NA                            | NA                                                                          | <500 U    | --        | <500 U    | --        | <500 U    | --        | <500 U    | --        | <500 U    | --        | <500 U    | --        | <500 U  | --      | <500 U  | --      | <500 U  | --      | <500 U  | --      | <500 U  | --      |  |  |  |  |  |  |  |
| BENZO(G,H,I)PERYLENE         | 191-24-2   | NLL                                                            | NLL                                                   | NLV                                                                             | 8.00E+08                                                | 2.50E+06                                    | NLL                                                       | 3.50E+08                                                    | 7.00E+06                                       | NA                            | NA                                                                          | <1000 U   | --        | <1000 U   | --        | <1000 U   | --        | <1000 U   | --        | <1000 U   | --        | <1000 U   | --        | <1000 U | --      | <1000 U | --      | <1000 U | --      | <1000 U | --      | <1000 U | --      |  |  |  |  |  |  |  |
| BENZO(K)FLUORANTHENE         | 207-08-9   | NLL                                                            | NLL                                                   | NLV                                                                             | ID                                                      | 2.00E+5 (Q)                                 | NLL                                                       | ID                                                          | 8.00E+5 (Q)                                    | NA                            | NA                                                                          | <500 U    | --        | <500 U    | --        | <500 U    | --        | <500 U    | --        | <500 U    | --        | <500 U    | --        | <500 U  | --      | <500 U  | --      | <500 U  | --      | <500 U  | --      | <500 U  | --      |  |  |  |  |  |  |  |
| BIS(2-ETHYLHEXYL)PHTHALATE   | 117-81-7   | NLL                                                            | NLL                                                   | NLV                                                                             | 7.00E+08                                                | 2.80E+06                                    | NLL                                                       | 8.90E+08                                                    | 1.20E+7 (C)                                    | NA                            | NA                                                                          | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM      | --      | NM      | --      | NM      | --      | NM      | --      | NM      | --      |  |  |  |  |  |  |  |
| BUTYL BENZYL PHTHALATE       | 85-68-7    | 13,000 (X)                                                     | 2.20E+6 (C)                                           | NLV                                                                             | 4.70E+10                                                | 3.60E+10 (C)                                | 5.00E+6 (C)                                               | 2.10E+10                                                    | 1.20E+8 (C)                                    | NA                            | NA                                                                          | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM      | --      | NM      | --      | NM      | --      | NM      | --      | NM      | --      |  |  |  |  |  |  |  |
| CHRYSENE                     | 218-01-9   | NLL                                                            | NLL                                                   | ID                                                                              | ID                                                      | 2.00E+6 (Q)                                 | NLL                                                       | ID                                                          | 8.00E+6 (Q)                                    | NA                            | NA                                                                          | <500 U    | --        | <500 U    | --        | 540       | --        | <500 U    | --        | <500 U    | --        | <500 U    | --        | <500 U  | --      | <500 U  | --      | 600     | --      | <500 U  | --      | <500 U  | --      |  |  |  |  |  |  |  |

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 5-1  
Summary of Soil Analytical Results  
Area A  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code                      |            | EGLE Part 201 Generic Cleanup Criteria                         |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |           | Area A    |           |         |           |         |           |         |           |         |           |         |           |         |           |         |           |         |           |         |         |    |     |    |    |    |    |    |    |
|------------------------------------|------------|----------------------------------------------------------------|-------------------------------------------------------|---------------------------------------------------------------------------------|---------------------------------------------------------|---------------------------------------------|-----------------------------------------------------------|-------------------------------------------------------------|------------------------------------------------|-------------------------------|-----------------------------------------------------------------------------|-----------|-----------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|---------|----|-----|----|----|----|----|----|----|
| Station Name                       | CAS Number | [2]<br>Groundwater Surface Water Interface Protection Criteria | [4]<br>Residential Drinking Water Protection Criteria | [5]<br>Residential Soil Volatilization to Indoor Air Inhalation Criteria (VSIC) | [9]<br>Residential Particulate Soil Inhalation Criteria | [10]<br>Residential Direct Contact Criteria | [11]<br>Nonresidential Drinking Water Protection Criteria | [16]<br>Nonresidential Particulate Soil Inhalation Criteria | [17]<br>Nonresidential Direct Contact Criteria | [18]<br>Soil Residential MSSL | [19]<br>Soil Nonresidential MSSL                                            | TH #1     | TH #2     |           | TH #3   |           | TH #4   |           | TH #5   |           | TH #6   |           | TH #7   |           | TH #8   |           | TH #9   |           | TH #10  |           | TH #11  |         |    |     |    |    |    |    |    |    |
| Field Sample ID                    |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             | TH #1     | TH #2     | TH #3     |         | TH #4     |         | TH #5     |         | TH #6     |         | TH #7     |         | TH #8     |         | TH #9     |         | TH #10    |         | TH #11    |         |         |    |     |    |    |    |    |    |    |
| Sample Date                        |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             | 4/17/1990 | 4/17/1990 | 4/17/1990 |         | 4/17/1990 |         | 4/17/1990 |         | 4/17/1990 |         | 4/17/1990 |         | 4/17/1990 |         | 4/17/1990 |         | 4/17/1990 |         | 4/17/1990 |         |         |    |     |    |    |    |    |    |    |
| Sample Interval (bgs)              |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             | --        | --        | 0 - 4 ft  |         | 4 - 8 ft  |         | --        |         | --        |         | --        |         | --        |         | --        |         | --        |         | --        |         | --      |    |     |    |    |    |    |    |    |
| Sample Description                 |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             | --        | --        | --        | --      | --        | --      | --        | --      | --        | --      | --        | --      | --        | --      | --        | --      | --        | --      | --        | --      | --      | -- | --  | -- | -- | -- | -- | -- | -- |
|                                    |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             |           |           |           |         |           |         |           |         |           |         |           |         |           |         |           |         |           |         |           |         |         |    |     |    |    |    |    |    |    |
|                                    |            | Result                                                         | Exceeds                                               | Result                                                                          | Exceeds                                                 | Result                                      | Exceeds                                                   | Result                                                      | Exceeds                                        | Result                        | Exceeds                                                                     | Result    | Exceeds   | Result    | Exceeds | Result    | Exceeds | Result    | Exceeds | Result    | Exceeds | Result    | Exceeds | Result    | Exceeds | Result    | Exceeds | Result    | Exceeds | Result    | Exceeds |         |    |     |    |    |    |    |    |    |
| Organics - SVOCs (ug/kg) Continued |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             |           |           |           |         |           |         |           |         |           |         |           |         |           |         |           |         |           |         |           |         |         |    |     |    |    |    |    |    |    |
| DIBENZO(A,H)ANTHRACENE             | 53-70-3    | NLL                                                            | NLL                                                   | NLV                                                                             | ID                                                      | 2,000 (Q)                                   | NLL                                                       | ID                                                          | 8,000 (Q)                                      | NA                            | NA                                                                          | <1000 U   | --        | <1000 U   | --      | <1000 U   | --      | <1000 U   | --      | <1000 U   | --      | <1000 U   | --      | <1000 U   | --      | <1000 U   | --      | <1000 U   | --      | <1000 U   | --      | <1000 U | -- |     |    |    |    |    |    |    |
| DIBENZOFURAN                       | 132-64-9   | 1,700                                                          | ID                                                    | 2.00E+06                                                                        | 6.70E+06                                                | ID                                          | ID                                                        | 2.90E+06                                                    | ID                                             | NA                            | NA                                                                          | NM        | --        | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM      | -- |     |    |    |    |    |    |    |
| FLUORANTHENE                       | 206-44-0   | 5,500                                                          | 730,000                                               | 1.00E+9 (D)                                                                     | 9.30E+09                                                | 4.60E+07                                    | 730,000                                                   | 4.10E+09                                                    | 1.30E+08                                       | NA                            | NA                                                                          | 200       | --        | <150 U    | --      | 390       | --      | <100 U    | --      | <100 U    | --      | 150       | --      | 370       | --      | <100 U    | --      | <100 U    | --      | 780       | --      | <100 U  | -- | 230 | -- |    |    |    |    |    |
| FLUORENE                           | 86-73-7    | 5,300                                                          | 390,000                                               | 5.80E+08                                                                        | 9.30E+09                                                | 2.70E+07                                    | 890,000                                                   | 4.10E+09                                                    | 8.70E+07                                       | NA                            | NA                                                                          | <200 U    | --        | <200 U    | --      | 270       | --      | <200 U    | --      | <200 U    | --      | 1,000     | --      | <200 U    | --      | <200 U    | --      | <200 U    | --      | <200 U    | --      | <200 U  | -- |     |    |    |    |    |    |    |
| INDENO(1,2,3-CD)PYRENE             | 193-39-5   | NLL                                                            | NLL                                                   | NLV                                                                             | ID                                                      | 20,000 (Q)                                  | NLL                                                       | ID                                                          | 80,000 (Q)                                     | NA                            | NA                                                                          | <1000 U   | --        | <1000 U   | --      | <1000 U   | --      | <1000 U   | --      | <1000 U   | --      | <1000 U   | --      | <1000 U   | --      | <1000 U   | --      | <1000 U   | --      | <1000 U   | --      | <1000 U | -- |     |    |    |    |    |    |    |
| NAPHTHALENE (SVOC)                 | 91-20-3S   | 730                                                            | 35,000                                                | 2.50E+05                                                                        | 2.00E+08                                                | 1.60E+07                                    | 1.00E+05                                                  | 8.80E+07                                                    | 5.20E+07                                       | NA                            | NA                                                                          | <100 U    | --        | <100 U    | --      | <150 U    | --      | <100 U    | --      | <100 U    | --      | 3,700     | [2]     | <100 U    | --      | <100 U    | --      | <100 U    | --      | <100 U    | --      | <100 U  | -- |     |    |    |    |    |    |    |
| PHENANTHRENE                       | 85-01-8    | 2,100                                                          | 56,000                                                | 2.80E+06                                                                        | 6.70E+06                                                | 1.60E+06                                    | 1.60E+05                                                  | 2.90E+06                                                    | 5.20E+06                                       | NA                            | NA                                                                          | <100 U    | --        | <100 U    | --      | 550       | --      | <100 U    | --      | <100 U    | --      | 2,000     | --      | 260       | --      | <100 U    | --      | <100 U    | --      | 640       | --      | <100 U  | -- |     |    |    |    |    |    |    |
| PYRENE                             | 129-00-0   | ID                                                             | 4.80E+05                                              | 1.00E+9 (D)                                                                     | 6.70E+09                                                | 2.90E+07                                    | 4.80E+05                                                  | 2.90E+09                                                    | 8.40E+07                                       | NA                            | NA                                                                          | 240       | --        | <100 U    | --      | 470       | --      | <100 U    | --      | <100 U    | --      | 260       | --      | 370       | --      | <100 U    | --      | <100 U    | --      | 670       | --      | <100 U  | -- |     |    |    |    |    |    |    |
| Organics - VOCs (ug/kg)            |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             |           |           |           |         |           |         |           |         |           |         |           |         |           |         |           |         |           |         |           |         |         |    |     |    |    |    |    |    |    |
| 1,2,3-TRIMETHYLBENZENE             | 526-73-8   | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | 270 (JT)                      | 800 (JT)                                                                    | NM        | --        | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM      | -- |     |    |    |    |    |    |    |
| 1,2,4-TRIMETHYLBENZENE             | 95-63-6    | 570 (I)                                                        | 2,100 (I)                                             | 4.3E+6 (C,I)                                                                    | 8.20E+10 (I)                                            | 3.2E+07 (C,I)                               | 2,100 (I)                                                 | 3.60E+10 (I)                                                | 1.00E+8 (C,I)                                  | 150 (JT)                      | 430 (JT)                                                                    | NM        | --        | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM      | -- |     |    |    |    |    |    |    |
| 1,3,5-TRIMETHYLBENZENE             | 108-67-8   | 1,100 (I)                                                      | 1,800 (I)                                             | 2.6E+6 (C,I)                                                                    | 8.20E+10 (I)                                            | 3.2E+07 (C)                                 | 2,100 (I)                                                 | 3.60E+10 (I)                                                | 1.00E+8 (C,I)                                  | 100 (JT)                      | 300 (JT)                                                                    | NM        | --        | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM      | -- |     |    |    |    |    |    |    |
| 2,2,4-TRIMETHYLPENTANE             | 540-84-1   | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | NM        | --        | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM      | -- |     |    |    |    |    |    |    |
| 2-METHYLNAPHTHALENE (VOC)          | 91-57-6V   | 4,200                                                          | 57,000                                                | 2.70E+06                                                                        | 6.70E+08                                                | 8.10E+06                                    | 1.70E+05                                                  | 2.90E+08                                                    | 2.60E+07                                       | NA                            | NA                                                                          | NM        | --        | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM      | -- |     |    |    |    |    |    |    |
| BENZENE                            | 71-43-2    | 240 (I,X)                                                      | 100 (I)                                               | 1,600 (I)                                                                       | 3.80E+8 (I)                                             | 1.8E+5 (I)                                  | 100 (I)                                                   | 4.70E+8 (I)                                                 | 8.40E+5 (C,I)                                  | 1.7 (M)                       | 7.9 (M)                                                                     | <1 U      | --        | <1 U      | --      | <1 U      | --      | <1 U      | --      | <10 U     | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U    | -- |     |    |    |    |    |    |    |
| CYCLOHEXANE                        | 110-82-7   | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | NM        | --        | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM      | -- |     |    |    |    |    |    |    |
| ETHYLBENZENE                       | 100-41-4   | 360                                                            | 1,500                                                 | 87,000                                                                          | 1.00E+10                                                | 2.20E+07                                    | 1,500                                                     | 1.30E+10                                                    | 7.10E+07                                       | 12 (M)                        | 57                                                                          | <1 U      | --        | <1 U      | --      | <1 U      | --      | <1 U      | --      | 76        | [18,19] | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U    | -- |     |    |    |    |    |    |    |
| HEXANE                             | 110-54-3   | NA                                                             | 1.8E+5 (C)                                            | 5.1E+5 (C)                                                                      | 1.30E+10                                                | 9.2E+7 (C)                                  | 5.10E+5 (C)                                               | 5.90E+09                                                    | 3.00E+8 (C)                                    | 25                            | 74                                                                          | NM        | --        | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM      | -- |     |    |    |    |    |    |    |
| ISOPROPYLBENZENE                   | 98-82-8    | 3,200                                                          | 91,000                                                | 4.00E+5 (C)                                                                     | 5.80E+09                                                | 2.50E+7 (C)                                 | 2.60E+05                                                  | 2.60E+09                                                    | 8.00E+7 (C)                                    | NA                            | NA                                                                          | NM        | --        | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM      | -- |     |    |    |    |    |    |    |
| M,P-XYLENE                         | 1330-20-7  | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | NM        | --        | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM      | -- |     |    |    |    |    |    |    |
| NAPHTHALENE (VOC)                  | 91-20-3V   | 730                                                            | 35,000                                                | 2.50E+05                                                                        | 2.00E+08                                                | 1.60E+07                                    | 1.00E+05                                                  | 8.80E+07                                                    | 5.20E+07                                       | NA                            | NA                                                                          | NM        | --        | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM      | -- |     |    |    |    |    |    |    |
| N-PROPYLBENZENE                    | 103-65-1   | ID                                                             | 1,600 (I)                                             | ID                                                                              | 1.30E+9 (I)                                             | 2.50E+6 (I)                                 | 4,600                                                     | 5.90E+08                                                    | 8.00E+06                                       | 1,800                         | 3,500                                                                       | NM        | --        | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM      | -- |     |    |    |    |    |    |    |
| O-XYLENE                           | 95-47-6    | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | NM        | --        | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM      | -- |     |    |    |    |    |    |    |
| P-ISOPROPYL TOLUENE (p-CYMENTHENE) | 99-87-6    | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | NM        | --        | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM      | -- |     |    |    |    |    |    |    |
| SEC-BUTYLBENZENE                   | 135-98-8   | ID                                                             | 1,600                                                 | ID                                                                              | 4.00E+08                                                | 2.50E+06                                    | 4,600                                                     | 1.80E+08                                                    | 8.00E+06                                       | NA                            | NA                                                                          | NM        | --        | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM      | -- |     |    |    |    |    |    |    |
| STYRENE                            | 100-42-5   | 530 (X)                                                        | 2,700                                                 | 2.50E+05                                                                        | 5.50E+09                                                | 4.00E+05                                    | 2,700                                                     | 6.90E+09                                                    | 1.90E+6 (C)                                    | NA                            | NA                                                                          | NM        | --        | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM      | -- |     |    |    |    |    |    |    |
| TETRACHLOROETHYLENE                | 127-18-4   | 220 (X)                                                        | 100                                                   | 11,000                                                                          | 2.70E+09                                                | 2.0E+5 (C)                                  | 100                                                       | 1.20E+09                                                    | 9.30E+5 (C)                                    | 6.2 (M)                       | 12 (M)                                                                      | <1 U      | --        | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <10 U     | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U    | -- |     |    |    |    |    |    |    |
| TOLUENE                            | 108-88-3   | 5,400 (I)                                                      | 16,000 (I)                                            | 3.30E+5 (C,I)                                                                   | 2.70E+10 (I)                                            | 5E+07 (C,I)                                 | 16,000 (I)                                                | 1.20E+10 (I)                                                | 1.60E+8 (C,I)                                  | 3,700                         | 11,000                                                                      | <1 U      | --        | <1 U      | --      | <1 U      | --      | <1 U      | --      | 59        | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U    | -- |     |    |    |    |    |    |    |
| XYLENE - TOTAL                     | 1330-20-7  | 980 (I)                                                        | 5,600 (I)                                             | 6.30E+6 (I)                                                                     | 2.90E+11 (I)                                            | 4.1E+08 (C,I)                               | 5,600 (I)                                                 | 1.30E+11 (I)                                                | 1.00E+9 (C,D,I)                                | 280 (J)                       | 830 (J)                                                                     | <3 U      | --        | <3 U      | --      | <3 U      | --      | <3 U      | --      | 620       | [18]    | <3 U      | --      | <3 U      | --      | <3 U      | --      | <3 U      | --      | <3 U      | --      | <3 U    | -- |     |    |    |    |    |    |    |
| Organics - Pesticides (ug/kg)      |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             |           |           |           |         |           |         |           |         |           |         |           |         |           |         |           |         |           |         |           |         |         |    |     |    |    |    |    |    |    |
| 4,4-DDE                            | 72-55-9    | NLL                                                            | NLL                                                   | NLV                                                                             | 3.20E+07                                                | 45,000                                      | NLL                                                       | 4.00E+07                                                    | 1.90E+05                                       | NA                            | NA                                                                          | NM        | --        | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM      | -- |     |    |    |    |    |    |    |
| 4,4-DDT                            | 50-29-3    | NLL                                                            | NLL                                                   | NLV                                                                             | 3.20E+07                                                | 57,000                                      | NLL                                                       | 4.00E+07                                                    | 2.80E+05                                       | NA                            | NA                                                                          | NM        | --        | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM      | -- |     |    |    |    |    |    |    |
| ALDRIN                             | 309-00-2   | NLL                                                            | NLL                                                   | 1.30E+06                                                                        | 6.40E+05                                                | 1,000                                       | NLL                                                       | 8.00E+05                                                    | 4,300                                          | NA                            | NA                                                                          | NM        | --        | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM      | -- |     |    |    |    |    |    |    |
| ALPHA-CHLORDANE                    | 5103-71-9  | NA                                                             | NA                                                    | NA                                                                              |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             |           |           |           |         |           |         |           |         |           |         |           |         |           |         |           |         |           |         |           |         |         |    |     |    |    |    |    |    |    |

TABLE 5-1  
Summary of Soil Analytical Results  
Area A  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code                |            | EGLE Part 201 Generic Cleanup Criteria                         |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |              | Area A  |           |         |              |         |           |         |              |         |           |         |              |         |           |         |                   |         |           |          |          |          |                                                                                           |          |                                                                                                                                                               |          |                                                                         |         |                                                                      |         |
|------------------------------|------------|----------------------------------------------------------------|-------------------------------------------------------|---------------------------------------------------------------------------------|---------------------------------------------------------|---------------------------------------------|-----------------------------------------------------------|-------------------------------------------------------------|------------------------------------------------|-------------------------------|-----------------------------------------------------------------------------|--------------|---------|-----------|---------|--------------|---------|-----------|---------|--------------|---------|-----------|---------|--------------|---------|-----------|---------|-------------------|---------|-----------|----------|----------|----------|-------------------------------------------------------------------------------------------|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-------------------------------------------------------------------------|---------|----------------------------------------------------------------------|---------|
| Station Name                 | CAS Number | [2]<br>Groundwater Surface Water Interface Protection Criteria | [4]<br>Residential Drinking Water Protection Criteria | [5]<br>Residential Soil Volatilization to Indoor Air Inhalation Criteria (VSIC) | [9]<br>Residential Particulate Soil Inhalation Criteria | [10]<br>Residential Direct Contact Criteria | [11]<br>Nonresidential Drinking Water Protection Criteria | [16]<br>Nonresidential Particulate Soil Inhalation Criteria | [17]<br>Nonresidential Direct Contact Criteria | [18]<br>Soil Residential MSSL | [19]<br>Soil Nonresidential MSSL                                            | TH #12       |         |           |         | MW #8        |         |           |         | MW #9        |         |           |         | MW #10       |         |           |         | Open Ditch Bottom |         | SS-1      |          | SS-2     |          | SS-3                                                                                      |          | SS-4                                                                                                                                                          |          |                                                                         |         |                                                                      |         |
| Field Sample ID              |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             | TH #12       |         | TH #12    |         | MW #8        |         | MW #8     |         | MW #9        |         | MW #9     |         | MW #10       |         | MW #10    |         | Open Ditch Bottom |         | SS 1      |          | SS 2     |          | SS 3                                                                                      |          | SS 4                                                                                                                                                          |          |                                                                         |         |                                                                      |         |
| Sample Date                  |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             | 10/2/1990    |         | 10/2/1990 |         | 10/2/1990    |         | 10/2/1990 |         | 10/2/1990    |         | 10/2/1990 |         | 10/2/1990    |         | 10/2/1990 |         | 10/2/1990         |         | 10/2/1990 |          | 6/5/2002 |          | 6/5/2002                                                                                  |          | 6/5/2002                                                                                                                                                      |          | 6/5/2002                                                                |         |                                                                      |         |
| Sample Interval (bgs)        |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             | 5.5 - 9.5 ft |         | --        |         | 5.5 - 9.5 ft |         | --        |         | 5.5 - 9.5 ft |         | --        |         | 5.5 - 9.5 ft |         | --        |         | 5.5 - 9.5 ft      |         | --        |          | --       |          | 0 - 3 in<br>0 - 12 in                                                                     |          | 0 - 3 in<br>0 - 12 in                                                                                                                                         |          | 0 - 3 in<br>0 - 12 in                                                   |         | 0 - 3 in<br>0 - 12 in                                                |         |
| Sample Description           |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             | --           |         | --        |         | --           |         | --        |         | --           |         | --        |         | --           |         | --        |         | --                |         | --        |          | --       |          | 0-½" - Dark gray, coarse sand. ½-3" - Dry, dark brown, medium sand with some coarse sand. |          | 0-½" - Dry, dark gray, coarse sand. ½-3" - Dry, dark brown, medium sand, with some fine gravel. Appears stamp sand on top-soil and stamp sand mixed under ½". |          | 0-3" - Slightly moist, dark brown, coarse sand with little fine gravel. |         | 0-3" - Slightly moist, medium dark brown sand with some fine gravel. |         |
|                              |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             | Result       | Exceeds | Result    | Exceeds | Result       | Exceeds | Result    | Exceeds | Result       | Exceeds | Result    | Exceeds | Result       | Exceeds | Result    | Exceeds | Result            | Exceeds | Result    | Exceeds  | Result   | Exceeds  | Result                                                                                    | Exceeds  | Result                                                                                                                                                        | Exceeds  | Result                                                                  | Exceeds | Result                                                               | Exceeds |
| Inorganics - Metals (mg/kg)  |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             |              |         |           |         |              |         |           |         |              |         |           |         |              |         |           |         |                   |         |           |          |          |          |                                                                                           |          |                                                                                                                                                               |          |                                                                         |         |                                                                      |         |
| ALUMINIUM                    | 7429-90-5  | NA                                                             | 6900 (B)                                              | NLV                                                                             | ID                                                      | 50,000 (D,BB)                               | 6,900 (B)                                                 | ID                                                          | 3.7E+5 (D,BB)                                  | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM                | --      | 30,000    | [4,11]   | 17,700   | [4,11]   | 21,800                                                                                    | [4,11]   | 9,290                                                                                                                                                         | [4,11]   |                                                                         |         |                                                                      |         |
| ANTIMONY                     | 7440-36-0  | 1.2 (X)                                                        | 4.3                                                   | NLV                                                                             | 13,000                                                  | 180                                         | 4.3                                                       | 5,900                                                       | 670                                            | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM                | --      | <0.8 UJ   | --       | 1.1 J    | --       | <0.81 UJ                                                                                  | --       | <0.81 UJ                                                                                                                                                      | --       |                                                                         |         |                                                                      |         |
| ARSENIC                      | 7440-38-2  | 4.6                                                            | 4.6                                                   | NLV                                                                             | 720                                                     | 7.6                                         | 4.6                                                       | 910                                                         | 37                                             | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM                | --      | 7.1       | [2,4,11] | 6.7      | [2,4,11] | 7.5                                                                                       | [2,4,11] | 5.2                                                                                                                                                           | [2,4,11] |                                                                         |         |                                                                      |         |
| BARIUM                       | 7440-39-3  | 130 (B,G)                                                      | 1,300 (B)                                             | NLV                                                                             | 3.3E+5 (B)                                              | 37,000 (B)                                  | 1,300 (B)                                                 | 1.5E+5 (B)                                                  | 1.3E+5 (B)                                     | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM                | --      | 20.8      | --       | 187      | [2]      | 113                                                                                       | --       | 35.3                                                                                                                                                          | --       |                                                                         |         |                                                                      |         |
| BERYLLIUM                    | 7440-41-7  | 24 (G)                                                         | 51                                                    | NLV                                                                             | 1,300                                                   | 410                                         | 51                                                        | 590                                                         | 1,600                                          | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM                | --      | 0.14      | --       | 0.12     | --       | 0.24                                                                                      | --       | 0.1                                                                                                                                                           | --       |                                                                         |         |                                                                      |         |
| CADMIUM                      | 7440-43-9  | 1.6 (B,G,X)                                                    | 6.0 (B)                                               | NLV                                                                             | 1,700 (B)                                               | 550 (B)                                     | 6.0 (B)                                                   | 2,200 (B)                                                   | 2,100 (B)                                      | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM                | --      | 0.13      | --       | <0.11 U  | --       | 0.24                                                                                      | --       | <0.11 U                                                                                                                                                       | --       |                                                                         |         |                                                                      |         |
| CALCIUM                      | 7440-70-2  | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM                | --      | 45,000 J  | --       | 26,200 J | --       | 38,700 J                                                                                  | --       | 10,200 J                                                                                                                                                      | --       |                                                                         |         |                                                                      |         |
| CHROMIUM                     | 7440-47-3  | 1.2E+6 (B,G,H,X)                                               | 1.0E+6 (B,D,H)                                        | NLV                                                                             | 3.30E+8 (B,H)                                           | 7.90E+5 (B,H)                               | 1.00E+6 (B,D,H)                                           | 1.50E+5 (B,H)                                               | 1.00E+6 (B,D,H)                                | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM                | --      | 76.9      | --       | 50.2     | --       | 59.9                                                                                      | --       | 18.9                                                                                                                                                          | --       |                                                                         |         |                                                                      |         |
| COBALT                       | 7440-48-4  | 2                                                              | 0.8                                                   | NLV                                                                             | 13,000                                                  | 2,600                                       | 2                                                         | 5,900                                                       | 9,000                                          | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM                | --      | 33.2      | [2,4,11] | 19.7     | [2,4,11] | 25.4                                                                                      | [2,4,11] | 11.7                                                                                                                                                          | [2,4,11] |                                                                         |         |                                                                      |         |
| COPPER                       | 7440-50-8  | 32 (B,G)                                                       | 5,800 (B)                                             | NLV                                                                             | 130,000 (B)                                             | 20,000 (B)                                  | 5,800 (B)                                                 | 59,000 (B)                                                  | 73,000 (B)                                     | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM                | --      | 1,630     | [2]      | 2,460 J  | [2]      | 2,130                                                                                     | [2]      | 1,260                                                                                                                                                         | [2]      |                                                                         |         |                                                                      |         |
| IRON                         | 7439-89-6  | --                                                             | 12,000 (B)                                            | NLV                                                                             | ID                                                      | 160,000 (B)                                 | 12,000 (B)                                                | ID                                                          | 580,000 (B)                                    | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM                | --      | 31,100    | [4,11]   | 27,100   | [4,11]   | 34,700                                                                                    | [4,11]   | 12,900                                                                                                                                                        | [4,11]   |                                                                         |         |                                                                      |         |
| LEAD                         | 7439-92-1  | 2,500 (B,G,X)                                                  | 700 (B)                                               | NLV                                                                             | 100,000 (B)                                             | 400 (B)                                     | 700 (B)                                                   | 44,000 (B)                                                  | 900 (B,DD)                                     | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM                | --      | 64.7 J    | --       | 165 J    | --       | 46.8 J                                                                                    | --       | 28.9 J                                                                                                                                                        | --       |                                                                         |         |                                                                      |         |
| LITHIUM                      | 7439-93-2  | 9.8 (B)                                                        | 9.8 (B)                                               | NLV                                                                             | 2.30E+9 (B)                                             | 4,200 (B,DD)                                | 9.8 (B)                                                   | 1.00E+6 (B)                                                 | 31,000 (B,DD)                                  | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM                | --      | NA        | --       | NA       | --       | NA                                                                                        | --       | NA                                                                                                                                                            | --       |                                                                         |         |                                                                      |         |
| MAGNESIUM                    | 7439-95-4  | --                                                             | 8,000 (B)                                             | NLV                                                                             | 6.70E+6 (B)                                             | 1.0E+9 (B,D)                                | 22,000 (B)                                                | 2.90E+6 (B)                                                 | 1.00E+6 (B,D)                                  | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM                | --      | 26,400    | [4,11]   | 14,300   | [4]      | 18,600                                                                                    | [4]      | 7,620                                                                                                                                                         | --       |                                                                         |         |                                                                      |         |
| MANGANESE                    | 7439-96-5  | 440 (B,G,X)                                                    | 440 (B)                                               | NLV                                                                             | 3,300 (B)                                               | 25,000 (B)                                  | 440 (B)                                                   | 1,500 (B)                                                   | 90,000 (B)                                     | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM                | --      | 849       | [2,4,11] | 471      | [2,4,11] | 659                                                                                       | [2,4,11] | 267                                                                                                                                                           | --       |                                                                         |         |                                                                      |         |
| MERCURY                      | 7439-97-6  | 0.13 (B,Z)                                                     | 1.7 (B,Z)                                             | 48 (B,Z)                                                                        | 20,000 (B,Z)                                            | 160 (B,Z)                                   | 1.7 (B,Z)                                                 | 8,800 (B,Z)                                                 | 580 (B,Z)                                      | 0.022 (M)                     | 0.066                                                                       | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM                | --      | <0.05 U   | --       | <0.05 U  | --       | 0.07                                                                                      | [18,19]  | 0.08                                                                                                                                                          | [18,19]  |                                                                         |         |                                                                      |         |
| NICKEL                       | 7440-02-0  | 29 (G)                                                         | 100 (B)                                               | NLV                                                                             | 13,000 (B)                                              | 40,000 (B)                                  | 100 (B)                                                   | 16,000 (B)                                                  | 1.50E+5 (B)                                    | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM                | --      | 80.1      | [2]      | 44.1     | [2]      | 58                                                                                        | [2]      | 23.7                                                                                                                                                          | --       |                                                                         |         |                                                                      |         |
| POTASSIUM                    | 7440-09-7  | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM                | --      | 278 J     | --       | 865 J    | --       | 865 J                                                                                     | --       | 468 J                                                                                                                                                         | --       |                                                                         |         |                                                                      |         |
| SELENIUM                     | 7782-49-2  | 0.41 (B)                                                       | 4.0 (B)                                               | NLV                                                                             | 130,000 (B)                                             | 2,600 (B)                                   | 4.0 (B)                                                   | 59,000 (B)                                                  | 9,600 (B)                                      | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM                | --      | 0.5       | [2]      | <0.47 U  | --       | <0.47 U                                                                                   | --       | <0.47 U                                                                                                                                                       | --       |                                                                         |         |                                                                      |         |
| SILVER                       | 7440-22-4  | 1.0 (B,M)                                                      | 4.5 (B)                                               | NLV                                                                             | 6700 (B)                                                | 2500 (B)                                    | 13 (B)                                                    | 2,900 (B)                                                   | 9,000 (B)                                      | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM                | --      | <0.23 U   | --       | 0.75     | --       | 0.45                                                                                      | --       | <0.24 U                                                                                                                                                       | --       |                                                                         |         |                                                                      |         |
| SODIUM                       | 7440-23-5  | NA                                                             | 4,600                                                 | NLV                                                                             | ID                                                      | 1.0E+6 (D)                                  | NA                                                        | ID                                                          | 1.0E+6 (D)                                     | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM                | --      | 809 J     | --       | 1,160 J  | --       | 1,470 J                                                                                   | --       | 683 J                                                                                                                                                         | --       |                                                                         |         |                                                                      |         |
| VANADIUM                     | 7440-62-2  | 430                                                            | 72                                                    | NLV                                                                             | ID                                                      | 750 (DD)                                    | 990                                                       | ID                                                          | 5,500 (DD)                                     | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM                | --      | 82.9      | [4]      | 52.4     | --       | 70.6                                                                                      | --       | 30.6                                                                                                                                                          | --       |                                                                         |         |                                                                      |         |
| ZINC                         | 7440-66-6  | 62 (B,G)                                                       | 2,400 (B)                                             | NLV                                                                             | ID                                                      | 1.70E+5 (B)                                 | 5,000 (B)                                                 | ID                                                          | 6.30E+5 (B)                                    | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM                | --      | 157       | [2]      | 197      | [2]      | 73.9                                                                                      | [2]      | 74.9                                                                                                                                                          | [2]      |                                                                         |         |                                                                      |         |
| Inorganics - Cyanide (mg/kg) |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             |              |         |           |         |              |         |           |         |              |         |           |         |              |         |           |         |                   |         |           |          |          |          |                                                                                           |          |                                                                                                                                                               |          |                                                                         |         |                                                                      |         |
| CYANIDE                      | 57-12-5    | 0.1 (P,R)                                                      | 4.0 (P,R)                                             | NLV                                                                             | 250 (P,R)                                               | 12 (P,R)                                    | 4.0 (P,R)                                                 | 250 (P,R)                                                   | 250 (P,R)                                      | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM                | --      | 0.15 J    | [2]      | 0.07 J   | --       | <0.04 UJ                                                                                  | --       | 0.08 J                                                                                                                                                        | --       |                                                                         |         |                                                                      |         |
| Organics - PCBs (ug/kg)      |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             |              |         |           |         |              |         |           |         |              |         |           |         |              |         |           |         |                   |         |           |          |          |          |                                                                                           |          |                                                                                                                                                               |          |                                                                         |         |                                                                      |         |
| AROCCLOR-1260                | 11096-82-5 | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM                | --      | <34 U     | --       | <36 U    | --       | <3500 U                                                                                   | --       | <35 U                                                                                                                                                         | --       |                                                                         |         |                                                                      |         |
| AROCCLOR-1262                | 37324-23-5 | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM                | --      | NM        | --       | NM       | --       | NM                                                                                        | --       | NM                                                                                                                                                            | --       |                                                                         |         |                                                                      |         |
| TOTAL PCBs                   | 1336-36-6  | NLL                                                            | NLL                                                   | 3.00E+6 (J,T)                                                                   | 5.20E+6 (J,T)                                           | 1,000 (J,T)                                 | NLL                                                       | 6.50E+6 (J,T)                                               | 1,000 (J,T)                                    | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM                | --      | ND        | --       | ND       | --       | ND                                                                                        | --       | ND                                                                                                                                                            | --       |                                                                         |         |                                                                      |         |
| Organics - SVOCs (ug/kg)     |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             |              |         |           |         |              |         |           |         |              |         |           |         |              |         |           |         |                   |         |           |          |          |          |                                                                                           |          |                                                                                                                                                               |          |                                                                         |         |                                                                      |         |
| 1,1-BIPHENYL                 | 92-52-4    | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM                | --      | <1700 U   | --       | <1800 U  | --       | <3500 U                                                                                   | --       | <1700 U                                                                                                                                                       | --       |                                                                         |         |                                                                      |         |
| 2-METHYLNAPHTHALENE (SVOC)   | 91-57-6S   | 4,200                                                          | 57,000                                                | 2.70E+06                                                                        | 6.70E+08                                                | 8.10E+06                                    | 1.70E+05                                                  | 2.90E+08                                                    | 2.60E+07                                       | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM                | --      | <1700 U   | --       | <1800 U  | --       | 600 J                                                                                     | --       | <1700 U                                                                                                                                                       | --       |                                                                         |         |                                                                      |         |
| ACENAPHTHENE                 | 83-32-9    | 8,700                                                          | 3.00E+05                                              | 1.90E+08                                                                        | 1.40E+10                                                | 4.10E+07                                    | 8.80E+05                                                  | 6.20E+09                                                    | 1.30E+08                                       | NA                            | NA                                                                          | <200 U       | --      | NM        | --      | <200 U       | --      | NM        | --      | <200 U       | --      | NM        | --      | <200 U       | --      | NM        | --      | <200 U            | --      | <1700 U   | --       | <1800 U  | --       | <1400 U                                                                                   | --       | <1700 U                                                                                                                                                       | --       |                                                                         |         |                                                                      |         |
| ACENAPHTHYLENE               | 208-96-8   | ID                                                             | 5,900                                                 | 1.60E+06                                                                        | 2.30E+09                                                | 1.60E+06                                    | 17,000                                                    | 1.00E+09                                                    | 5.20E+06                                       | NA                            | NA                                                                          | <100 U       | --      | NM        | --      | <100 U       | --      | NM        | --      | <100 U       | --      | NM        | --      | <100 U       | --      | NM        | --      | <100 U            | --      | <1700 U   | --       | <1800 U  | --       | <3500 U                                                                                   | --       | <1700 U                                                                                                                                                       | --       |                                                                         |         |                                                                      |         |
| ACETOPHENONE                 | 98-86-2    | ID                                                             | 30,000                                                | 1.20E+8 (C)                                                                     | 3.30E+10                                                | 4.70E+7 (C)                                 | 88,000                                                    | 1.40E+10                                                    | 1.50E+8 (C)                                    | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM                | --      | <1700 U   | --       | <1800 U  | --       | <3500 U                                                                                   | --       | <1700 U                                                                                                                                                       | --       |                                                                         |         |                                                                      |         |
| ANTHRACENE                   | 120-12-7   | ID                                                             | 41,000                                                | 1.00E+9 (D)                                                                     | 6.70E+10                                                | 2.30E+08                                    | 41,000                                                    | 2.90E+10                                                    | 7.30E+08                                       | NA                            | NA                                                                          | <100 U       | --      | NM        | --      | <100 U       | --      | NM        | --      | <100 U       | --      | NM        | --      | <100 U       | --      | NM        | --      | <100 U            | --</    |           |          |          |          |                                                                                           |          |                                                                                                                                                               |          |                                                                         |         |                                                                      |         |



**TABLE 5-1**  
**Summary of Soil Analytical Results**  
**Area A**  
**Quincy Mining Company Portage Operations Area**  
**Abandoned Mining Wastes - Torch Lake Non-Superfund Site**

| Location Code                      |            | EGLE Part 201 Generic Cleanup Criteria                         |                                                       |                                                                                |                                                         |                                             |                                                           |                                                             |                                                |                               | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |              | Area A  |           |         |              |         |           |         |              |         |           |         |              |         |           |         |                   |         |           |         |                                                                                                                                                                    |         |                                                                         |    |                                                                      |  |                       |  |                       |  |
|------------------------------------|------------|----------------------------------------------------------------|-------------------------------------------------------|--------------------------------------------------------------------------------|---------------------------------------------------------|---------------------------------------------|-----------------------------------------------------------|-------------------------------------------------------------|------------------------------------------------|-------------------------------|-----------------------------------------------------------------------------|--------------|---------|-----------|---------|--------------|---------|-----------|---------|--------------|---------|-----------|---------|--------------|---------|-----------|---------|-------------------|---------|-----------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-------------------------------------------------------------------------|----|----------------------------------------------------------------------|--|-----------------------|--|-----------------------|--|
| Station Name                       | CAS Number | [2]<br>Groundwater Surface Water Interface Protection Criteria | [4]<br>Residential Drinking Water Protection Criteria | [5]<br>Residential Soil Volatilization to Indoor Air Inhalation Criteria (VSC) | [9]<br>Residential Particulate Soil Inhalation Criteria | [10]<br>Residential Direct Contact Criteria | [11]<br>Nonresidential Drinking Water Protection Criteria | [16]<br>Nonresidential Particulate Soil Inhalation Criteria | [17]<br>Nonresidential Direct Contact Criteria | [18]<br>Soil Residential MSSL | [19]<br>Soil Nonresidential MSSL                                            | TH #12       |         |           |         | MW #8        |         |           |         | MW #9        |         |           |         | MW #10       |         |           |         | Open Ditch Bottom |         | SS-1      |         | SS-2                                                                                                                                                               |         | SS-3                                                                    |    | SS-4                                                                 |  |                       |  |                       |  |
| Field Sample ID                    |            |                                                                |                                                       |                                                                                |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             | TH #12       |         | TH #12    |         | MW #8        |         | MW #8     |         | MW #9        |         | MW #9     |         | MW #10       |         | MW #10    |         | Open Ditch Bottom |         | SS 1      |         | SS 2                                                                                                                                                               |         | SS 3                                                                    |    | SS 4                                                                 |  |                       |  |                       |  |
| Sample Date                        |            |                                                                |                                                       |                                                                                |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             | 10/2/1990    |         | 10/2/1990 |         | 10/2/1990    |         | 10/2/1990 |         | 10/2/1990    |         | 10/2/1990 |         | 10/2/1990    |         | 10/2/1990 |         | 10/2/1990         |         | 10/2/1990 |         | 6/5/2002                                                                                                                                                           |         | 6/5/2002                                                                |    | 6/5/2002                                                             |  | 6/5/2002              |  |                       |  |
| Sample Interval (bgs)              |            |                                                                |                                                       |                                                                                |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             | 5.5 - 9.5 ft |         | --        |         | 5.5 - 9.5 ft |         | --        |         | 5.5 - 9.5 ft |         | --        |         | 5.5 - 9.5 ft |         | --        |         | 5.5 - 9.5 ft      |         | --        |         | --                                                                                                                                                                 |         | 0 - 3 in<br>0 - 12 in                                                   |    | 0 - 3 in<br>0 - 12 in                                                |  | 0 - 3 in<br>0 - 12 in |  | 0 - 3 in<br>0 - 12 in |  |
| Sample Description                 |            |                                                                |                                                       |                                                                                |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             | --           |         | --        |         | --           |         | --        |         | --           |         | --        |         | --           |         | --        |         | --                |         | --        |         | 0-½" - Dry, dark gray, coarse sand.<br>½-3" - Dry, dark brown, medium sand, with some fine gravel.<br>Appears stamp sand on top-soil and stamp sand mixed under ½" |         | 0-3" - Slightly moist, dark brown, coarse sand with little fine gravel. |    | 0-3" - Slightly moist, medium dark brown sand with some fine gravel. |  |                       |  |                       |  |
|                                    |            |                                                                |                                                       |                                                                                |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             | Result       | Exceeds | Result    | Exceeds | Result       | Exceeds | Result    | Exceeds | Result       | Exceeds | Result    | Exceeds | Result       | Exceeds | Result    | Exceeds | Result            | Exceeds | Result    | Exceeds | Result                                                                                                                                                             | Exceeds |                                                                         |    |                                                                      |  |                       |  |                       |  |
| Organics - SVOCs (ug/kg) Continued |            |                                                                |                                                       |                                                                                |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             |              |         |           |         |              |         |           |         |              |         |           |         |              |         |           |         |                   |         |           |         |                                                                                                                                                                    |         |                                                                         |    |                                                                      |  |                       |  |                       |  |
| DIBENZO(A,H)ANTHRACENE             | 53-70-3    | NLL                                                            | NLL                                                   | NLV                                                                            | ID                                                      | 2,000 (Q)                                   | NLL                                                       | ID                                                          | 8,000 (Q)                                      | NA                            | NA                                                                          | <1000 U      | --      | NM        | --      | <1000 U      | --      | NM        | --      | <1000 U      | --      | NM        | --      | <1000 U      | --      | <1700 U   | --      | <1800 U           | --      | <3500 U   | --      | <1700 U                                                                                                                                                            | --      |                                                                         |    |                                                                      |  |                       |  |                       |  |
| DIBENZOFURAN                       | 132-64-9   | 1,700                                                          | ID                                                    | 2.00E+06                                                                       | 6.70E+06                                                | ID                                          | ID                                                        | 2.90E+06                                                    | ID                                             | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | <1700 U   | --      | <1800 U           | --      | <3500 U   | --      | <1700 U                                                                                                                                                            | --      |                                                                         |    |                                                                      |  |                       |  |                       |  |
| FLUORANTHENE                       | 206-44-0   | 5,500                                                          | 730,000                                               | 1.00E+09                                                                       | 9.30E+09                                                | 4.60E+07                                    | 730,000                                                   | 4.10E+09                                                    | 1.30E+08                                       | NA                            | NA                                                                          | 110          | --      | NM        | --      | <100 U       | --      | NM        | --      | <100 U       | --      | NM        | --      | 440          | --      | 540 J     | --      | <1800 U           | --      | 370 J     | --      | 440 J                                                                                                                                                              | --      |                                                                         |    |                                                                      |  |                       |  |                       |  |
| FLUORENE                           | 86-73-7    | 5,300                                                          | 390,000                                               | 5.80E+08                                                                       | 9.30E+09                                                | 2.70E+07                                    | 890,000                                                   | 4.10E+09                                                    | 8.70E+07                                       | NA                            | NA                                                                          | 1,400        | --      | NM        | --      | <200 U       | --      | NM        | --      | <200 U       | --      | NM        | --      | <200 U       | --      | <1700 U   | --      | <1800 U           | --      | <3500 U   | --      | <1700 U                                                                                                                                                            | --      |                                                                         |    |                                                                      |  |                       |  |                       |  |
| INDENO(1,2,3-CD)PYRENE             | 193-39-5   | NLL                                                            | NLL                                                   | NLV                                                                            | ID                                                      | 20,000 (Q)                                  | NLL                                                       | ID                                                          | 80,000 (Q)                                     | NA                            | NA                                                                          | <1000 U      | --      | NM        | --      | <1000 U      | --      | NM        | --      | <1000 U      | --      | NM        | --      | <1000 U      | --      | <1700 U   | --      | <1800 U           | --      | <3500 U   | --      | <1700 U                                                                                                                                                            | --      |                                                                         |    |                                                                      |  |                       |  |                       |  |
| NAPHTHALENE (SVOC)                 | 91-20-3S   | 730                                                            | 35,000                                                | 2.50E+05                                                                       | 2.00E+08                                                | 1.60E+07                                    | 1.00E+05                                                  | 8.80E+07                                                    | 5.20E+07                                       | NA                            | NA                                                                          | 1,800        | [2]     | NM        | --      | <100 U       | --      | NM        | --      | 110          | --      | NM        | --      | <100 U       | --      | <1700 U   | --      | <1800 U           | --      | 360 J     | --      | <1700 U                                                                                                                                                            | --      |                                                                         |    |                                                                      |  |                       |  |                       |  |
| PHENANTHRENE                       | 85-01-8    | 2,100                                                          | 56,000                                                | 2.80E+06                                                                       | 6.70E+06                                                | 1.60E+06                                    | 1.60E+05                                                  | 2.90E+06                                                    | 5.20E+06                                       | NA                            | NA                                                                          | 3,400        | [2]     | NM        | --      | <100 U       | --      | NM        | --      | 320          | --      | NM        | --      | <100 U       | --      | 220       | --      | 290 J             | --      | <1800 U   | --      | 510 J                                                                                                                                                              | --      | 200 J                                                                   | -- |                                                                      |  |                       |  |                       |  |
| PYRENE                             | 129-00-0   | ID                                                             | 4.80E+05                                              | 1.00E+9 (D)                                                                    | 6.70E+09                                                | 2.90E+07                                    | 4.80E+05                                                  | 2.90E+09                                                    | 8.40E+07                                       | NA                            | NA                                                                          | 380          | --      | NM        | --      | 100          | --      | NM        | --      | 180          | --      | NM        | --      | <100 U       | --      | 410       | --      | <1800 U           | --      | <3500 U   | --      | 390 J                                                                                                                                                              | --      |                                                                         |    |                                                                      |  |                       |  |                       |  |
| Organics - VOCs (ug/kg)            |            |                                                                |                                                       |                                                                                |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             |              |         |           |         |              |         |           |         |              |         |           |         |              |         |           |         |                   |         |           |         |                                                                                                                                                                    |         |                                                                         |    |                                                                      |  |                       |  |                       |  |
| 1,2,3-TRIMETHYLBENZENE             | 526-73-8   | NA                                                             | NA                                                    | NA                                                                             | NA                                                      | NA                                          | NA                                                        | NA                                                          | 270 (JT)                                       | 800 (JT)                      | NM                                                                          | --           | NM      | --        | NM      | --           | NM      | --        | NM      | --           | NM      | --        | NM      | --           | NM      | --        | NM      | --                | NM      | --        | NM      | --                                                                                                                                                                 |         |                                                                         |    |                                                                      |  |                       |  |                       |  |
| 1,2,4-TRIMETHYLBENZENE             | 95-63-6    | 570 (I)                                                        | 2,100 (I)                                             | 4.3E+6 (C,I)                                                                   | 8.20E+10 (I)                                            | 3.2E+07 (C,I)                               | 2,100 (I)                                                 | 3.60E+10 (I)                                                | 1.00E+8 (C,I)                                  | 150 (JT)                      | 430 (JT)                                                                    | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | <52 U     | --      | <53 U             | --      | 260       | [18]    | <51 U                                                                                                                                                              | --      |                                                                         |    |                                                                      |  |                       |  |                       |  |
| 1,3,5-TRIMETHYLBENZENE             | 108-67-8   | 1,100 (I)                                                      | 1,800 (I)                                             | 2.6E+6 (C,I)                                                                   | 8.20E+10 (I)                                            | 3.2E+07 (C)                                 | 2,100 (I)                                                 | 3.60E+10 (I)                                                | 1.00E+8 (C,I)                                  | 100 (JT)                      | 300 (JT)                                                                    | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | <52 U     | --      | <53 U             | --      | 63        | --      | <51 U                                                                                                                                                              | --      |                                                                         |    |                                                                      |  |                       |  |                       |  |
| 2,2,4-TRIMETHYLPENTANE             | 540-84-1   | NA                                                             | NA                                                    | NA                                                                             | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM                | --      | NM        | --      | NM                                                                                                                                                                 | --      |                                                                         |    |                                                                      |  |                       |  |                       |  |
| 2-METHYLNAPHTHALENE (VOC)          | 91-57-6V   | 4,200                                                          | 57,000                                                | 2.70E+06                                                                       | 6.70E+08                                                | 8.10E+06                                    | 1.70E+05                                                  | 2.90E+08                                                    | 2.60E+07                                       | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | <260 U    | --      | <270 U            | --      | 530       | --      | <250 U                                                                                                                                                             | --      |                                                                         |    |                                                                      |  |                       |  |                       |  |
| BENZENE                            | 71-43-2    | 240 (I,X)                                                      | 100 (I)                                               | 1.600 (I)                                                                      | 3.80E+8 (I)                                             | 1.8E+5 (I)                                  | 100 (I)                                                   | 4.70E+8 (I)                                                 | 8.40E+5 (C,I)                                  | 1.7 (M)                       | 7.9 (M)                                                                     | NM           | --      | <25 U     | --      | NM           | --      | <1 U      | --      | NM           | --      | <1 U      | --      | NM           | --      | <52 U     | --      | <53 U             | --      | <62 U     | --      | <51 U                                                                                                                                                              | --      |                                                                         |    |                                                                      |  |                       |  |                       |  |
| CYCLOHEXANE                        | 110-82-7   | NA                                                             | NA                                                    | NA                                                                             | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM                | --      | NM        | --      | NM                                                                                                                                                                 | --      |                                                                         |    |                                                                      |  |                       |  |                       |  |
| ETHYLBENZENE                       | 100-41-4   | 360                                                            | 1,500                                                 | 87,000                                                                         | 1.00E+10                                                | 2.20E+07                                    | 1,500                                                     | 1.30E+10                                                    | 7.10E+07                                       | 12 (M)                        | 57                                                                          | NM           | --      | <100 U    | --      | NM           | --      | <1 U      | --      | NM           | --      | <1 U      | --      | NM           | --      | <52 U     | --      | <53 U             | --      | <62 U     | --      | <51 U                                                                                                                                                              | --      |                                                                         |    |                                                                      |  |                       |  |                       |  |
| HEXANE                             | 110-54-3   | NA                                                             | 1.8E+5 (C)                                            | 5.1E+5 (C )                                                                    | 1.30E+10                                                | 9.2E+7 (C)                                  | 5.10E+5 (C)                                               | 5.90E+09                                                    | 3.00E+8 (C)                                    | 25                            | 74                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM                | --      | NM        | --      | NM                                                                                                                                                                 | --      |                                                                         |    |                                                                      |  |                       |  |                       |  |
| ISOPROPYLBENZENE                   | 98-82-8    | 3,200                                                          | 91,000                                                | 4.00E+5 (C )                                                                   | 5.80E+09                                                | 2.50E+7 (C)                                 | 2.60E+05                                                  | 2.60E+09                                                    | 8.00E+7 (C)                                    | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | <52 U     | --      | <53 U             | --      | <62 U     | --      | <51 U                                                                                                                                                              | --      |                                                                         |    |                                                                      |  |                       |  |                       |  |
| M,P-XYLENE                         | 1330-20-7  | NA                                                             | NA                                                    | NA                                                                             | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | <100 U    | --      | <110 U            | --      | 360       | --      | <100 U                                                                                                                                                             | --      |                                                                         |    |                                                                      |  |                       |  |                       |  |
| NAPHTHALENE (VOC)                  | 91-20-3V   | 730                                                            | 35,000                                                | 2.50E+05                                                                       | 2.00E+08                                                | 1.60E+07                                    | 1.00E+05                                                  | 8.80E+07                                                    | 5.20E+07                                       | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | <260 U    | --      | <270 U            | --      | 450       | --      | <250 U                                                                                                                                                             | --      |                                                                         |    |                                                                      |  |                       |  |                       |  |
| N-PROPYLBENZENE                    | 103-65-1   | ID                                                             | 1,600 (I)                                             | ID                                                                             | 1.30E+9 (I)                                             | 2.50E+6 (I)                                 | 4,600                                                     | 5.90E+08                                                    | 8.00E+06                                       | 1,800                         | 3,500                                                                       | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | <52 U     | --      | <53 U             | --      | <62 U     | --      | <51 U                                                                                                                                                              | --      |                                                                         |    |                                                                      |  |                       |  |                       |  |
| O-XYLENE                           | 95-47-6    | NA                                                             | NA                                                    | NA                                                                             | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | <52 U     | --      | <53 U             | --      | 280       | --      | <51 U                                                                                                                                                              | --      |                                                                         |    |                                                                      |  |                       |  |                       |  |
| P-ISOPROPYL TOLUENE (p-CYMENE)     | 99-87-6    | NA                                                             | NA                                                    | NA                                                                             | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | <52 U     | --      | <53 U             | --      | <62 U     | --      | <51 U                                                                                                                                                              | --      |                                                                         |    |                                                                      |  |                       |  |                       |  |
| SEC-BUTYLBENZENE                   | 135-98-8   | ID                                                             | 1,600                                                 | ID                                                                             | 4.00E+08                                                | 2.50E+06                                    | 4,600                                                     | 1.80E+08                                                    | 8.00E+06                                       | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | <52 U     | --      | <53 U             | --      | <62 U     | --      | <51 U                                                                                                                                                              | --      |                                                                         |    |                                                                      |  |                       |  |                       |  |
| STYRENE                            | 100-42-5   | 530 (X)                                                        | 2,700                                                 | 2.50E+05                                                                       | 5.50E+09                                                | 4.00E+05                                    | 2,700                                                     | 6.90E+09                                                    | 1.90E+6 (C)                                    | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | <52 U     | --      | 300               | --      | <62 U     | --      | <51 U                                                                                                                                                              | --      |                                                                         |    |                                                                      |  |                       |  |                       |  |
| TETRACHLOROETHYLENE                | 127-18-4   | 220 (X)                                                        | 100                                                   | 11,000                                                                         | 2.70E+09                                                | 2.0E+5 (C)                                  | 100                                                       | 1.20E+09                                                    | 9.30E+5 (C)                                    | 6.2 (M)                       | 12 (M)                                                                      | NM           | --      | <5 U      | --      | NM           | --      | <1 U      | --      | NM           | --      | <1 U      | --      | NM           | --      | <52 U     | --      | <53 U             | --      | <62 U     | --      | <51 U                                                                                                                                                              | --      |                                                                         |    |                                                                      |  |                       |  |                       |  |
| TOLUENE                            | 108-88-3   | 5,400 (I)                                                      | 16,000 (I)                                            | 3.30E+5 (C,I)                                                                  | 2.70E+10 (I)                                            | 5E+07 (C,I)                                 | 16,000 (I)                                                | 1.20E+10 (I)                                                | 1.60E+8 (C,I)                                  | 3,700                         | 11,000                                                                      | NM           | --      | <50 U     | --      | NM           | --      | <1 U      | --      | NM           | --      | <1 U      | --      | NM           | --      | <5 U      | --      | <53 U             | --      | 220       | --      | <51 U                                                                                                                                                              | --      |                                                                         |    |                                                                      |  |                       |  |                       |  |
| XYLENE - TOTAL                     | 1330-20-7  | 980 (I)                                                        | 5,600 (I)                                             | 6.30E+6 (I)                                                                    | 2.90E+11 (I)                                            | 4.1E+08 (C,I)                               | 5,600 (I)                                                 | 1.30E+11 (I)                                                | 1.00E+9 (C,D,I)                                | 280 (J)                       | 830 (J)                                                                     | NM           | --      | <5000 U   | --      | NM           | --      | <1 U      | --      | NM           | --      | <5 U      | --      | NM           | --      | <5 U      | --      | NM                | --      | ND        | --      | ND                                                                                                                                                                 | --      |                                                                         |    |                                                                      |  |                       |  |                       |  |
| Organics - Pesticides (ug/kg)      |            |                                                                |                                                       |                                                                                |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             |              |         |           |         |              |         |           |         |              |         |           |         |              |         |           |         |                   |         |           |         |                                                                                                                                                                    |         |                                                                         |    |                                                                      |  |                       |  |                       |  |
| 4,4-DDE                            | 72-55-9    | NLL                                                            | NLL                                                   | NLV                                                                            | 3.20E+07                                                | 45,000                                      | NLL                                                       | 4.00E+07                                                    | 1.90E+05                                       | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | <3.4 U    | --      | <3.6 U            | --      | <350 U    | --      | <3.5 U                                                                                                                                                             | --      |                                                                         |    |                                                                      |  |                       |  |                       |  |
| 4,4-DDT                            | 50-29-3    | NLL                                                            | NLL                                                   | NLV                                                                            | 3.20E+07                                                | 57,000                                      | NLL                                                       | 4.00E+07                                                    | 2.80E+05                                       | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | <3.4 U    | --      | <3.6 U            | --      | <350 U    | --      | <3.5 U                                                                                                                                                             | --      |                                                                         |    |                                                                      |  |                       |  |                       |  |
| ALDRIN                             | 309-00-2   | NLL                                                            | NLL                                                   | 1.30E+06                                                                       | 6.40E+05                                                | 1,000                                       | NLL                                                       | 8.00E+05                                                    | 4,300                                          | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | <1.7 U    | --      | <1.8 U            | --      | <180 U    | --      | <1.8 U                                                                                                                                                             | --      |                                                                         |    |                                                                      |  |                       |  |                       |  |
| ALPHA-CHLORDANE                    | 5103-71-9  | NA                                                             | NA                                                    | NA                                                                             | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | 1.9       | --      | 4.1               | --      | 370       | --      | 2.1                                                                                                                                                                | --      |                                                                         |    |                                                                      |  |                       |  |                       |  |
| BETA-BHC                           | 319-85-7   | ID                                                             | 37                                                    | NLV                                                                            | 5.90E+06                                                | 5,400                                       | 150                                                       | 7.40E+06                                                    | 25,000                                         | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | <1.7 U    | --      | 3.2               | --      | <180 U    | --      | <1.8 U                                                                                                                                                             | --      |                                                                         |    |                                                                      |  |                       |  |                       |  |
| ENDOSULFAN I                       | 959-98-8   | NLL                                                            | NLL                                                   | ID                                                                             | ID                                                      | 1.4E+06 (J)                                 | NLL                                                       | ID                                                          | 4.40E+06 (J)                                   | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | <1.7 U    | --      | <1.8 U            | --      | <180 U    | --      | <1.8 U                                                                                                                                                             | --      |                                                                         |    |                                                                      |  |                       |  |                       |  |
| ENDRIN KETONE                      | 53494-70-5 | NA                                                             | NA                                                    | NA                                                                             | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | 3.5       | --      | <3.6 U            | --      | <350 U    | --      | 2 J                                                                                                                                                                | --      |                                                                         |    |                                                                      |  |                       |  |                       |  |
| GAMMA-CHLORDANE                    | 5103-74-2  | NA                                                             | NA                                                    | NA                                                                             | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | 1.8       | --      | 4.4               | --      | 390       | --      | 1.7 J                                                                                                                                                              | --      |                                                                         |    |                                                                      |  |                       |  |                       |  |
| HEPTACHLOR                         | 76-44-8    | NLL                                                            | NLL                                                   | 3.50E+05                                                                       | 2.40E+06                                                | 5,600                                       | NLL                                                       | 3.00E+06                                                    | 23,000                                         | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | <1.7 U    | --      | 2.3               | --      | 170 J     | --      | <1.8 U                                                                                                                                                             | --      |                                                                         |    |                                                                      |  |                       |  |                       |  |
| Other                              |            |                                                                |                                                       |                                                                                |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             |              |         |           |         |              |         |           |         |              |         |           |         |              |         |           |         |                   |         |           |         |                                                                                                                                                                    |         |                                                                         |    |                                                                      |  |                       |  |                       |  |
| CHLORIDE (mg/kg)                   | --         | 94 (X)                                                         | 5,000                                                 | NLV                                                                            | ID                                                      | 500 (F)                                     | 5,000                                                     | ID                                                          | 500 (F)                                        | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM                | --      | NM        | --      | NM                                                                                                                                                                 | --      |                                                                         |    |                                                                      |  |                       |  |                       |  |
| PERCENT MOISTURE (%)               | --         | NA                                                             | NA                                                    | NA                                                                             | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM           | --      | NM        | --      | NM                | --      | NM        | --      | NM                                                                                                                                                                 | --      |                                                                         |    |                                                                      |  |                       |  |                       |  |
| HYDROCARBONS, TOTAL (mg/kg)        | --         | NA                                                             | NA                                                    | NA                                                                             | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | 1,526        | --      | NM        | --      | 264          | --      | NM        | --      | 208          | --      | NM        | --      | 118          | --      | NM        | --      | 175               | --      | NM        | --      | NM                                                                                                                                                                 | --      |                                                                         |    |                                                                      |  |                       |  |                       |  |

*Note: Analytical and Criteria Footnotes are included on the last page of the table.*

TABLE 5-1  
Summary of Soil Analytical Results  
Area A  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Soil Table Footnotes:

- EGLE Part 201 residential and non-residential generic cleanup criteria and screening levels criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Release Date: December 30, 2013. Updated June 2018.

- Only detected analytes are listed - Gray rows indicate requested analyses. If no analytes are listed below a gray row then all analytes of that group were either not analyzed or not detected.

- **Bold** values are concentrations detected above the laboratory reporting limit.

- **Bold/Shaded** cells indicate analyte concentration exceeded applicable criteria. EGLE Part 201 criteria exceeded is indicated by the footnote in [brackets] following the result value and defined below:

|                                                                                |                                                                                    |
|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| [2] - Groundwater Surface Water Interface Protection Criteria                  | [11] - Nonresidential Drinking Water Protection Criteria                           |
| [3] - Soil Saturation Concentration Screening Levels                           | [12] - Nonresidential Soil Volatilization to Indoor Air Inhalation Criteria (VIAC) |
| [4] - Residential Drinking Water Protection Criteria                           | [13] - Nonresidential Infinite Source Volatile Soil Inhalation Criteria (VSIC)     |
| [5] - Residential Soil Volatilization to Indoor Air Inhalation Criteria (VIAC) | [14] - Nonresidential Finite VSIC for 5 Meter Source Thickness                     |
| [6] - Residential Infinite Source Volatile Soil Inhalation Criteria (VSIC)     | [15] - Nonresidential Finite VSIC for 2 Meter Source Thickness                     |
| [7] - Residential Finite VSIC for 5 Meter Source Thickness                     | [16] - Nonresidential Particulate Soil Inhalation Criteria                         |
| [8] - Residential Finite VSIC for 2 Meter Source Thickness                     | [17] - Nonresidential Direct Contact Criteria                                      |
| [9] - Residential Particulate Soil Inhalation Criteria                         | [18] - Soil Residential MSSL                                                       |
| [10] - Residential Direct Contact Criteria                                     | [19] - Soil Nonresidential MSSL                                                    |

Evaluation based on EGLE Criteria at time of Project completion.

Samples described in this evaluation may actually refer to stamp sands or to other mining waste from the historic mining and reclamation processes conducted in the area.

|                                  |                                                                                   |
|----------------------------------|-----------------------------------------------------------------------------------|
| -- = No Exceedances              | PCBs = Polychlorinated biphenyls                                                  |
| NM = Not Measured                | VOC = Volatile organic compound                                                   |
| ND = Not Detected                | SVOC = Semi-volatile organic compound                                             |
| bgs = Below ground surface       | MSSL = Media-Specific Volatilization to Indoor Air Interim Action Screening Level |
| ft = Feet                        | ug/kg = Micrograms per kilogram                                                   |
| in = Inches                      | % = Percentage                                                                    |
| mg/kg = Milligrams per kilogram. |                                                                                   |

Criteria Footnotes:

ID = Insufficient data to develop criterion.

NA = A criterion or value is not available

NLL = Hazardous substance is not likely to leach under most soil conditions.

(B) = Background, as defined in R 299.1(b), may be substituted if higher than the calculated cleanup criterion. Background levels may be less than criteria for some inorganic compounds.

(BB) = The state drinking water standard for asbestos (fibers greater than 10 micrometers in length) is in units of a million fibers per liter of water (MFL). Soil concentrations of asbestos are determined by polarized light microscop.

(C) = The criterion developed under R 299.20 to R 299.26 exceeds the chemical- specific soil saturation screening level (Csat). The person proposing or implementing response activity shall document whether additional response activity is required to control free-phase liquids or NAPL to protect against risks associated with free-phase liquids by using methods appropriate for the free-phase liquids present. Development of a site-specific Csat or methods presented in R 299.22, R 299.24(5), and R 299.26(8) may be conducted for the relevant exposure pathways.

(D) = Calculated criterion exceeds 100 percent, hence it is reduced to 100 percent or 1.0E+9 parts per billion (ppb).

(DD) = Hazardous substance causes developmental effects. Residential direct contact criteria are protective of both prenatal and postnatal exposure. Nonresidential direct contact criteria are protective for a pregnant adult receptor.

(F) = Criterion is based on adverse impacts to plant life and phytotoxicity.

(G) = Groundwater surface water interface (GSI) criterion depends on the pH or water hardness, or both, of the receiving surface water. The final chronic value (FCV) for the protection of aquatic life shall be calculated based on the pH or hardness of the receiving surface water. Where water hardness exceeds 400 mg Ca/L, use 400 mg CaCO<sub>3</sub>/L for the FCV calculation. The FCV formula provides values in units of ug/L or ppb.

The generic GSI criterion is the lesser of the calculated FCV, the wildlife value (WV), and the surface water human non-drinking water value (HNDV). The soil GSI protection criteria for these hazardous substances are the greater of the 20 times the GSI criterion or the GSI soil-water partition values using the GSI criteria developed with the procedure described in this footnote. A spreadsheet that may be used to calculate GSI and GSI protection criteria for (G)-footnoted hazardous substances is available on the Department of Environment, Great Lakes, and Energy (EGLE) internet web site. A hardness value of 47.5 CaCO<sub>3</sub>/L and pH of 7, derived from the Michigan Department of Environmental Quality Draft Site Inspection Report for Lake Linden Operations dated 3/29/13, was used in the footnote G calculation spreadsheet.

(H) = Valence-specific chromium data (Cr III and Cr VI) shall be compared to the corresponding valence-specific cleanup criteria. If both Cr III and Cr VI are present in groundwater, the total concentration of both cannot exceed the drinking water criterion of 100 ug/L. If analytical data are provided for total chromium only, they shall be compared to the cleanup criteria for Cr VI. Cr III soil cleanup criterion for protection of drinking water can only be used at sites where groundwater is prevented from being used as a public water supply, currently and in the future, through an approved land or resource use restriction.

(I) = Hazardous substance may exhibit the characteristic of ignitability as defined in 40 C.F.R. §261.21 (revised as of July 1, 2001), which is adopted by reference in these rules and is available for inspection at the EGLE, 525 West Allegan Street, Lansing, Michigan. Copies of the regulation may be purchased, at a cost as of the time of adoption of these rules of \$45, from the Superintendent of documents, Government Printing Office, Washington, DC 20401 (stock number 869-044-00155-1), or from the EGLE, Remediation and Redevelopment Division (RRD), 525 West Allegan Street, Lansing, Michigan 48933, at cost.

(J) = Hazardous substance may be present in several isomer forms. Isomer-specific concentrations shall be added together for comparison to criteria.

(M) = Calculated criterion is below the analytical target detection limit, therefore, the criterion defaults to the target detection limit.

(P) = Amenable cyanide methods or method OIA-1677 shall be used to quantify cyanide concentrations for compliance with all groundwater criteria. Total cyanide methods or method OIA-1677 shall be used to quantify cyanide concentrations for compliance with soil criteria. Nonresidential direct contact criteria may not be protective of the potential for release of hydrogen cyanide gas. Additional land or resource use restrictions may be necessary to protect for the acute inhalation concerns associated with hydrogen cyanide gas.

(Q) = Criteria for carcinogenic polycyclic aromatic hydrocarbons were developed using relative potential potencies to benzo(a)pyrene.

(R) = Hazardous substance may exhibit the characteristic of reactivity as defined in 40 C.F.R. §261.23 (revised as of July 1, 2001), which is adopted by reference in these rules and is available for inspection at the EGLE, 525 West Allegan Street, Lansing, Michigan. Copies of the regulation may be purchased, at a cost as of the time of adoption of these rules of \$45, from the Superintendent of Documents, Government Printing Office, Washington, DC 20401 (stock number 869-044-00155-1), or from the EGLE, RRD, 525 West Allegan Street, Lansing, Michigan 48933, at cost.

(T) = Refer to the federal Toxic Substances Control Act (TSCA), 40 C.F.R. §761, Subpart D and 40 C.F.R. §761, Subpart G, to determine the applicability of TSCA cleanup standards. Subpart D and Subpart G of 40 C.F.R. §761 (July 1, 2001) are adopted by reference in these rules and are available for inspection at the EGLE, 525 West Allegan Street, Lansing, Michigan. Copies of the regulations may be purchased, at a cost as of the time of adoption of these rules of \$55, from the Superintendent of Documents, Government Printing Office, Washington, DC 20401, or from the EGLE, RRD, 525 West Allegan Street, Lansing, Michigan 48933, at cost. Alternatives to compliance with the TSCA standards listed below are possible under 40 C.F.R. §761 Subpart D. New releases may be subject to the standards identified in 40 C.F.R. §761, Subpart G. Use Part 201 soil direct contact cleanup criteria in the published table if TSCA standards are not applicable.

(X) = The GSI criterion shown in the generic cleanup criteria tables is not protective for surface water that is used as a drinking water source. (See R 299.49 Footnotes for generic cleanup criteria tables for additional information.)

(Z) = Mercury is typically measured as total mercury. The generic cleanup criteria, however, are based on data for different species of mercury. Specifically, data for elemental mercury, chemical abstract service (CAS) number 7439976, serve as the basis for the soil volatilization to indoor air criteria, groundwater volatilization to indoor air, and soil inhalation criteria. Data for methyl mercury, CAS number 22967926, serve as the basis for the GSI criterion; and data for mercuric chloride, CAS number 7487947, serve as the basis for the drinking water, groundwater contact, soil direct contact, and the groundwater protection criteria. Comparison to criteria shall be based on species-specific analytical data only if sufficient facility characterization has been conducted to rule out the presence of other species of mercury.

MSSL Footnotes:

J = Hazardous substance may be present in several isomer forms. Isomer-specific concentrations must be added together for comparison to screening level.

JT = Hazardous substance may be present in several isomer forms. Screening levels may be used for the individual isomer provided that it is the sole isomer detected; however, when multiple isomers are detected in a medium, the isomer-specific concentrations must be added together and compared to the most restrictive screening level of the detected isomers.

M = The screening level may be below target detection limits (TDL).

Laboratory Footnotes:

J = The result is an estimated quantity.

U = Analyte analyzed for but not detected above the reported sample reporting limit.

UU = Analyte analyzed for but not detected above the reported sample reporting limit and is an estimated quantity.

**TABLE 5-1**  
**Summary of Soil Analytical Results**  
**Area A**  
**Quincy Mining Company Portage Operations Area**  
**Abandoned Mining Wastes - Torch Lake Non-Superfund Site**

|                                                                                                         | Part 201 Generic Cleanup Criteria Evaluated                                        | Exceedance |
|---------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------|
| <b>EGLE Part 201 Generic Cleanup Criteria<br/>(June 2018)</b>                                           | [2] - Groundwater Surface Water Interface Protection Criteria                      | YES        |
|                                                                                                         | [3] - Soil Saturation Concentration Screening Levels                               | NO         |
|                                                                                                         | [4] - Residential Drinking Water Protection Criteria                               | YES        |
|                                                                                                         | [5] - Residential Soil Volatilization to Indoor Air Inhalation Criteria (VIAC)     | NO         |
|                                                                                                         | [6] - Residential Infinite Source Volatile Soil Inhalation Criteria (VSIC)         | NO         |
|                                                                                                         | [7] - Residential Finite VSIC for 5 Meter Source Thickness                         | NO         |
|                                                                                                         | [8] - Residential Finite VSIC for 2 Meter Source Thickness                         | NO         |
|                                                                                                         | [9] - Residential Particulate Soil Inhalation Criteria                             | NO         |
|                                                                                                         | [10] - Residential Direct Contact Criteria                                         | NO         |
|                                                                                                         | [11] - Nonresidential Drinking Water Protection Criteria                           | YES        |
|                                                                                                         | [12] - Nonresidential Soil Volatilization to Indoor Air Inhalation Criteria (VIAC) | NO         |
|                                                                                                         | [13] - Nonresidential Infinite Source Volatile Soil Inhalation Criteria (VSIC)     | NO         |
|                                                                                                         | [14] - Nonresidential Finite VSIC for 5 Meter Source Thickness                     | NO         |
|                                                                                                         | [15] - Nonresidential Finite VSIC for 2 Meter Source Thickness                     | NO         |
|                                                                                                         | [16] - Nonresidential Particulate Soil Inhalation Criteria                         | NO         |
|                                                                                                         | [17] - Nonresidential Direct Contact Criteria                                      | NO         |
| <b>Media-Specific Volatilization to Indoor Air Interim<br/>Action Screening Levels<br/>(March 2021)</b> | [18] - Soil Residential Media-Specific Screening Level (MSSL)                      | YES        |
|                                                                                                         | [19] - Soil Nonresidential MSSL                                                    | YES        |

TABLE 5-2  
Summary of Groundwater Analytical Results  
Area A  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code                      |            | EGLE Part 201 Generic Cleanup Criteria           |                                                     |                                                              |                                                                                                |                                                                                                   |                         | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                                         |                                            |                                               |                                               |                                                             |           | Area A  |           |         |           |         |           |         |           |         |           |         |           |         |           |         |           |         |        |         |        |         |        |         |        |         |
|------------------------------------|------------|--------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------|-----------------------------------------------|-----------------------------------------------|-------------------------------------------------------------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|--------|---------|--------|---------|--------|---------|--------|---------|
| Station Name                       | CAS Number | [1]<br>Residential<br>Drinking Water<br>Criteria | [2]<br>Nonresidential<br>Drinking Water<br>Criteria | [3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [4]<br>Residential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [5]<br>Nonresidential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [6]<br>Water Solubility | [8]<br>Shallow<br>Groundwater<br>Residential<br>MSSL                        | [9]<br>Shallow<br>Groundwater<br>Nonresidential<br>MSSL | [10]<br>Groundwater<br>Residential<br>MSSL | [11]<br>Groundwater<br>Residential TS<br>MSSL | [12]<br>Groundwater<br>Nonresidential<br>MSSL | [13]<br>Groundwater<br>Nonresidential<br>MSSL <sub>12</sub> | MW #1     |         |           |         | MW #2     |         |           |         | MW #3     |         |           |         | MW #4     |         |           |         |           |         |        |         |        |         |        |         |        |         |
| Field Sample ID                    |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | MW #1     |         | MW #1     |         | MW #2     |         | MW #2     |         | MW #3     |         | MW #3     |         | MW #4     |         | MW #4     |         | MW-4      |         |        |         |        |         |        |         |        |         |
| Sample Date                        |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 4/19/1990 |         | 10/3/1990 |         | 4/19/1990 |         | 10/3/1990 |         | 4/19/1990 |         | 10/3/1990 |         | 4/19/1990 |         | 10/3/1990 |         | 4/23/2008 |         |        |         |        |         |        |         |        |         |
| Sample Interval (bgs)              |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | --        |         | --        |         | --        |         | --        |         | --        |         | --        |         | --        |         | --        |         | --        |         |        |         |        |         |        |         |        |         |
|                                    |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | Result    | Exceeds | Result    | Exceeds | Result    | Exceeds | Result    | Exceeds | Result    | Exceeds | Result    | Exceeds | Result    | Exceeds | Result    | Exceeds | Result    | Exceeds | Result | Exceeds | Result | Exceeds | Result | Exceeds | Result | Exceeds |
| Inorganics - Metals (ug/l)         |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |           |         |           |         |           |         |           |         |           |         |           |         |           |         |           |         |           |         |        |         |        |         |        |         |        |         |
| ARSENIC                            | 7440-38-2  | 10 (A)                                           | 10 (A)                                              | 10                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |        |         |        |         |        |         |        |         |
| BARIUM                             | 7440-39-3  | 2,000 (A,B)                                      | 2,000 (A,B)                                         | 200 (B,G)                                                    | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |        |         |        |         |        |         |        |         |
| CADMIUM                            | 7440-43-9  | 5.0 (A,B)                                        | 5.0 (A,B)                                           | 1.3 (B,G,X)                                                  | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |        |         |        |         |        |         |        |         |
| CALCIUM                            | 7440-70-2  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |        |         |        |         |        |         |        |         |
| CHROMIUM                           | 7440-47-3  | 100 (A,B,H)                                      | 100 (A,B,H)                                         | 40 (B,G,H,X)                                                 | NA                                                                                             | NLV                                                                                               | NLV                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |        |         |        |         |        |         |        |         |
| COPPER                             | 7440-50-8  | 4.0 (B,E)                                        | 4.0 (B,E)                                           | 14 (B,G)                                                     | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |        |         |        |         |        |         |        |         |
| LEAD                               | 7439-92-1  | 4.0 (B,L)                                        | 4.0 (B,L)                                           | 14 (B,G,X)                                                   | NVL                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |        |         |        |         |        |         |        |         |
| MAGNESIUM                          | 7439-95-4  | 400,000 (B)                                      | 1,100,000 (B)                                       | NA                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |        |         |        |         |        |         |        |         |
| MANGANESE                          | 7439-96-5  | 50 (B,E)                                         | 50 (B,E)                                            | 1,000 (B,G,X)                                                | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |        |         |        |         |        |         |        |         |
| MERCURY                            | 7439-97-6  | 2.0 (A,B,Z)                                      | 2.0 (A,B,Z)                                         | 0.0013 (B,Z)                                                 | 56 (B,S,Z)                                                                                     | 56 (B,S,Z)                                                                                        | 56 (B,Z)                | 0.088                                                                       | 0.14                                                    | 1.4                                        | 4.3                                           | 4.3                                           | 8.5                                                         | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |        |         |        |         |        |         |        |         |
| POTASSIUM                          | 7440-09-7  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |        |         |        |         |        |         |        |         |
| SELENIUM                           | 7782-49-2  | 50 (A,B)                                         | 50 (A,B)                                            | 5 (B)                                                        | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |        |         |        |         |        |         |        |         |
| SILVER                             | 7440-22-4  | 34 (B)                                           | 98 (B)                                              | 0.2 (B,M)                                                    | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |        |         |        |         |        |         |        |         |
| SODIUM                             | 7440-23-5  | 230,000 (HH)                                     | 350,000                                             | NA                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |        |         |        |         |        |         |        |         |
| STRONTIUM                          | 7440-24-6  | 4,600 (B)                                        | 13,000 (B)                                          | 21,000 (B)                                                   | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |        |         |        |         |        |         |        |         |
| ZINC                               | 7440-66-6  | 2,400 (B)                                        | 5,000 (B,E)                                         | 63 (B,G)                                                     | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |        |         |        |         |        |         |        |         |
| Organics - PCBs as Aroclors (ug/l) |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |           |         |           |         |           |         |           |         |           |         |           |         |           |         |           |         |           |         |        |         |        |         |        |         |        |         |
| TOTAL PCBs                         | 1336-36-6  | 0.5 (A,J,T)                                      | 0.5 (A,J,T)                                         | 0.2 (J,M,T)                                                  | 45 (J,S,T)                                                                                     | 45 (J,S,T)                                                                                        | 44.7 (J,T)              | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |        |         |        |         |        |         |        |         |
| Organics - SVOCs (ug/l)            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |           |         |           |         |           |         |           |         |           |         |           |         |           |         |           |         |           |         |        |         |        |         |        |         |        |         |
| 2-METHYLNAPHTHALENE (SVOC)         | 91-57-6S   | 260                                              | 750                                                 | 19                                                           | 25,000 (S)                                                                                     | 25,000 (S)                                                                                        | 24,600                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |        |         |        |         |        |         |        |         |
| ACENAPHTHENE                       | 83-32-9    | 1,300                                            | 3,800                                               | 38                                                           | 4,200 (S)                                                                                      | 4,200 (S)                                                                                         | 4,240                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <2 U      | --      | <2 U      | --      | <2 U      | --      | <2 U      | --      | <2 U      | --      | <2 U      | --      | <2 U      | --      | NM        | --      |           |         |        |         |        |         |        |         |        |         |
| ACENAPHTHYLENE                     | 208-96-8   | 52                                               | 150                                                 | ID                                                           | 3,900 (S)                                                                                      | 3,900 (S)                                                                                         | 3,930                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | NM        | --      |           |         |        |         |        |         |        |         |        |         |
| ANTHRACENE                         | 120-12-7   | 43 (S)                                           | 43 (S)                                              | ID                                                           | 43 (S)                                                                                         | 43 (S)                                                                                            | 43.4                    | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | NM        | --      |           |         |        |         |        |         |        |         |        |         |
| BENZO(A)ANTHRACENE                 | 56-55-3    | 2.1 (Q)                                          | 8.5 (Q)                                             | ID                                                           | NLV                                                                                            | NLV                                                                                               | 9.4 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U      | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      | NM        | --      |           |         |        |         |        |         |        |         |        |         |
| BENZO(A)PYRENE                     | 50-32-8    | 5.0 (A,Q)                                        | 5.0 (A,Q)                                           | ID                                                           | NLV                                                                                            | NLV                                                                                               | 1.62 (Q)                | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U      | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      | NM        | --      |           |         |        |         |        |         |        |         |        |         |
| BENZO(B)FLUORANTHENE               | 205-99-2   | 1.5 (Q,S,AA)                                     | 1.5 (Q,S,AA)                                        | ID                                                           | ID                                                                                             | ID                                                                                                | 1.5 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U      | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      | NM        | --      |           |         |        |         |        |         |        |         |        |         |
| BENZO(G,H,I)PERYLENE               | 191-24-2   | 1.0 (M)                                          | 1.0 (M)                                             | ID                                                           | NLV                                                                                            | NLV                                                                                               | 0.26                    | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <10 U     | --      | <10 U     | --      | <10 U     | --      | <10 U     | --      | <10 U     | --      | <10 U     | --      | <10 U     | --      | NM        | --      |           |         |        |         |        |         |        |         |        |         |
| BENZO(K)FLUORANTHENE               | 207-08-9   | 1.0 (M,Q)                                        | 1.0 (M,Q)                                           | NA                                                           | NLV                                                                                            | NLV                                                                                               | 0.8 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U      | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      | NM        | --      |           |         |        |         |        |         |        |         |        |         |
| CHRYSENE                           | 218-01-9   | 1.6 (Q,S)                                        | 1.6 (Q,S)                                           | ID                                                           | ID                                                                                             | ID                                                                                                | 1.6 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U      | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      | NM        | --      |           |         |        |         |        |         |        |         |        |         |
| FLUORANTHENE                       | 206-44-0   | 210 (S)                                          | 210 (S)                                             | 1.6                                                          | 210 (S)                                                                                        | 210 (S)                                                                                           | 206                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | NM        | --      |           |         |        |         |        |         |        |         |        |         |
| FLUORENE                           | 86-73-7    | 880                                              | 2,000 (S)                                           | 12                                                           | 2,000 (S)                                                                                      | 2,000 (S)                                                                                         | 1,980                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <2 U      | --      | <2 U      | --      | <2 U      | --      | <2 U      | --      | <2 U      | --      | <2 U      | --      | <2 U      | --      | NM        | --      |           |         |        |         |        |         |        |         |        |         |
| INDENO(1,2,3-CD)PYRENE             | 193-39-5   | 2.0 (M,Q)                                        | 2.0 (M,Q)                                           | ID                                                           | NLV                                                                                            | NLV                                                                                               | 0.022 (Q)               | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <10 U     | --      | <10 U     | --      | <10 U     | --      | <10 U     | --      | <10 U     | --      | <10 U     | --      | <10 U     | --      | NM        | --      |           |         |        |         |        |         |        |         |        |         |
| NAPHTHALENE (SVOC)                 | 91-20-3S   | 520                                              | 1,500                                               | 11                                                           | 31,000 (S)                                                                                     | 31,000 (S)                                                                                        | 31,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | NM        | --      |           |         |        |         |        |         |        |         |        |         |
| PENTACHLOROPHENOL                  | 87-86-5    | 1.0 (A)                                          | 1.0 (A)                                             | 1.8 (G,X)                                                    | NLV                                                                                            | NLV                                                                                               | 1.85E+06                | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |        |         |        |         |        |         |        |         |
| PHENANTHRENE                       | 85-01-8    | 52                                               | 150                                                 | 2.0 (M)                                                      | 1,000 (S)                                                                                      | 1,000 (S)                                                                                         | 1,000                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | NM        | --      |           |         |        |         |        |         |        |         |        |         |
| PYRENE                             | 129-00-0   | 140 (S)                                          | 140 (S)                                             | ID                                                           | 140 (S)                                                                                        | 140 (S)                                                                                           | 135                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | NM        | --      |           |         |        |         |        |         |        |         |        |         |

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 5-2  
Summary of Groundwater Analytical Results  
Area A  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code              |            | EGLE Part 201 Generic Cleanup Criteria           |                                                     |                                                              |                                                                                                |                                                                                                   |                         | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                                         |                                            |                                               |                                               |                                                             | Area A    |           |           |           |           |           |           |           |           |         |        |         |        |         |        |         |        |         |
|----------------------------|------------|--------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------|-----------------------------------------------|-----------------------------------------------|-------------------------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|---------|--------|---------|--------|---------|--------|---------|--------|---------|
| Station Name               | CAS Number | [1]<br>Residential<br>Drinking Water<br>Criteria | [2]<br>Nonresidential<br>Drinking Water<br>Criteria | [3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [4]<br>Residential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [5]<br>Nonresidential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [6]<br>Water Solubility | [8]<br>Shallow<br>Groundwater<br>Residential<br>MSSL                        | [9]<br>Shallow<br>Groundwater<br>Nonresidential<br>MSSL | [10]<br>Groundwater<br>Residential<br>MSSL | [11]<br>Groundwater<br>Residential TS<br>MSSL | [12]<br>Groundwater<br>Nonresidential<br>MSSL | [13]<br>Groundwater<br>Nonresidential<br>MSSL <sub>12</sub> | MW #1     |           | MW #2     |           | MW #3     |           | MW #4     |           |           |         |        |         |        |         |        |         |        |         |
| Field Sample ID            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | MW #1     | MW #1     | MW #2     | MW #2     | MW #3     | MW #3     | MW #4     | MW #4     | MW-4      |         |        |         |        |         |        |         |        |         |
| Sample Date                |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 4/19/1990 | 10/3/1990 | 4/19/1990 | 10/3/1990 | 4/19/1990 | 10/3/1990 | 4/19/1990 | 10/3/1990 | 4/23/2008 |         |        |         |        |         |        |         |        |         |
| Sample Interval (bgs)      |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | --        | --        | --        | --        | --        | --        | --        | --        | --        |         |        |         |        |         |        |         |        |         |
|                            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | Result    | Exceeds   | Result    | Exceeds   | Result    | Exceeds   | Result    | Exceeds   | Result    | Exceeds | Result | Exceeds | Result | Exceeds | Result | Exceeds | Result | Exceeds |
| Organics - VOCs (ug/l)     |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |           |           |           |           |           |           |           |           |           |         |        |         |        |         |        |         |        |         |
| 1,1,1-TRICHLOROETHANE      | 71-55-6    | 200 (A)                                          | 200 (A)                                             | 89                                                           | 660,000                                                                                        | 1,300,000 (S)                                                                                     | 1,330,000               | 180                                                                         | 500                                                     | 8,600                                      | 8,600                                         | 24,000                                        | 24,000                                                      | <1 U      | --        | <1 U      | --        | <1 U      | --        | <1 U      | --        | 1.2       | --      | <1 U   | --      | <1 U   | --      | <1 U   | --      | <1 U   | --      |
| 1,2,3-TRIMETHYLBENZENE     | 526-73-8   | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | 43 (JT)                                                                     | 67 (JT)                                                 | 800 (JT)                                   | 2,400 (JT)                                    | 2,300 (JT)                                    | 4,700 (JT)                                                  | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --      | NM     | --      | NM     | --      | NM     | --      | <1 U   | --      |
| 1,2,4-TRIMETHYLBENZENE     | 95-63-6    | 63 (E,I)                                         | 63 (E,I)                                            | 17 (I)                                                       | 56,000 (I,S)                                                                                   | 56,000 (I,S)                                                                                      | 55,890 (I)              | 25 (JT)                                                                     | 44 (JT)                                                 | 440 (JT)                                   | 1,300 (JT)                                    | 1,300 (JT)                                    | 2,600 (JT)                                                  | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --      | NM     | --      | NM     | --      | NM     | --      | <1 U   | --      |
| 1,3,5-TRIMETHYLBENZENE     | 108-67-8   | 72 (E,I)                                         | 72 (E,I)                                            | 45 (I)                                                       | 61,000 (I,S)                                                                                   | 61,000 (I,S)                                                                                      | 61,150 (I)              | 18 (JT)                                                                     | 30 (JT)                                                 | 310 (JT)                                   | 940 (JT)                                      | 920 (JT)                                      | 1,800 (JT)                                                  | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --      | NM     | --      | NM     | --      | NM     | --      | <1 U   | --      |
| 2-METHYLNAPHTHALENE (VOC)  | 91-57-6V   | 260                                              | 750                                                 | 19                                                           | 25,000 (S)                                                                                     | 25,000 (S)                                                                                        | 24,600                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --      | NM     | --      | NM     | --      | NM     | --      | <5 U   | --      |
| ACETONE                    | 67-64-1    | 730 (I)                                          | 2100 (I)                                            | 1700 (I)                                                     | 1.0E+9 (D,I,S)                                                                                 | 1.0E+9 (D,I,S)                                                                                    | 1.0E+9 (I)              | 50,000                                                                      | 62,000                                                  | 1.20E+07                                   | 1.20E+07                                      | 2.50E+07                                      | 2.50E+07                                                    | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --      | NM     | --      | NM     | --      | NM     | --      | <20 U  | --      |
| BENZENE                    | 71-43-2    | 5.0 (A,I)                                        | 5.0 (A,I)                                           | 12 (I,X)                                                     | 5,600 (I)                                                                                      | 35,000 (I)                                                                                        | 1,750,000 (I)           | 1                                                                           | 2.7                                                     | 14                                         | 82                                            | 66                                            | 130                                                         | <1 U      | --        | <1 U      | --        | <1 U      | --        | <1 U      | --        | <1 U      | --      | <1 U   | --      | <1 U   | --      | <1 U   | --      | <1 U   | --      |
| CYCLOHEXANE                | 110-82-7   | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --      | NM     | --      | NM     | --      | NM     | --      | <5 U   | --      |
| ETHYLBENZENE               | 100-41-4   | 74 (E,I)                                         | 74 (E,I)                                            | 18 (I)                                                       | 110,000 (I)                                                                                    | 170,000 (I,S)                                                                                     | 169,000 (I)             | 2.8                                                                         | 7.6                                                     | 45                                         | 450                                           | 210                                           | 420                                                         | <1 U      | --        | <1 U      | --        | <1 U      | --        | <1 U      | --        | <1 U      | --      | <1 U   | --      | <1 U   | --      | <1 U   | --      | <1 U   | --      |
| HEXANE                     | 110-54-3   | 3,000                                            | 8,600                                               | NA                                                           | 12,000 (S)                                                                                     | 12,000 (S)                                                                                        | 12,000                  | 29                                                                          | 85                                                      | 29 (GW)                                    | 33                                            | 85 (GW)                                       | 170 (GW)                                                    | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --      | NM     | --      | NM     | --      | NM     | --      | NM     | --      |
| ISOPROPYLBENZENE           | 98-82-8    | 800                                              | 2,300                                               | 28                                                           | 56,000 (S)                                                                                     | 56,000 (S)                                                                                        | 56,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --      | NM     | --      | NM     | --      | NM     | --      | <1 U   | --      |
| M,P-XYLENE                 | 1330-20-7  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --      | NM     | --      | NM     | --      | NM     | --      | <2 U   | --      |
| NAPHTHALENE (VOC)          | 91-20-3V   | 520                                              | 1,500                                               | 11                                                           | 31,000 (S)                                                                                     | 31,000 (S)                                                                                        | 31,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --      | NM     | --      | NM     | --      | NM     | --      | <5 U   | --      |
| N-PROPYLBENZENE            | 103-65-1   | 80 (I)                                           | 230 (I)                                             | ID                                                           | ID                                                                                             | ID                                                                                                | NA                      | 43                                                                          | 83                                                      | 4100                                       | 12000                                         | 8100                                          | 8100                                                        | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --      | NM     | --      | NM     | --      | NM     | --      | <1 U   | --      |
| O-XYLENE                   | 95-47-6    | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --      | NM     | --      | NM     | --      | NM     | --      | <1 U   | --      |
| TETRACHLOROETHYLENE        | 127-18-4   | 5.0 (A)                                          | 5.0 (A)                                             | 11 (X)                                                       | 25,000                                                                                         | 170,000                                                                                           | 200,000                 | 1.5                                                                         | 3                                                       | 96                                         | 96                                            | 190                                           | 380                                                         | <1 U      | --        | <1 U      | --        | <1 U      | --        | <1 U      | --        | <1 U      | --      | <1 U   | --      | <1 U   | --      | <1 U   | --      | <1 U   | --      |
| TOLUENE                    | 108-88-3   | 790 (E,I)                                        | 790 (E,I)                                           | 270 (I)                                                      | 530,000 (I,S)                                                                                  | 530,000 (I,S)                                                                                     | 526,000 (I)             | 300                                                                         | 570                                                     | 23,000                                     | 33,000                                        | 66,000                                        | 66,000                                                      | <1 U      | --        | <1 U      | --        | <1 U      | --        | <1 U      | --        | <1 U      | --      | <1 U   | --      | <1 U   | --      | <1 U   | --      | <1 U   | --      |
| TRICHLOROETHYLENE          | 79-01-6    | 5.0 (A)                                          | 5.0 (A)                                             | 29 (X)                                                       | 2,200                                                                                          | 4,900                                                                                             | 1,100,000               | 0.073 (M)                                                                   | 0.14 (M)                                                | 6.1                                        | 18                                            | 12                                            | 24                                                          | <1 U      | --        | <1 U      | --        | <1 U      | --        | <1 U      | --        | <1 U      | --      | <1 U   | --      | <1 U   | --      | <1 U   | --      | <1 U   | --      |
| XYLENE - TOTAL             | 1330-20-7  | 280 (E,I)                                        | 280 (E,I)                                           | 49 (I)                                                       | 190,000 (I,S)                                                                                  | 190,000 (I,S)                                                                                     | 186,000 (I)             | 75 (J)                                                                      | 120 (J)                                                 | 1,200 (J)                                  | 3,600 (J)                                     | 3,500 (J)                                     | 7,100 (J)                                                   | <3 U      | --        | <1 U      | --        | <3 U      | --        | <1 U      | --        | <3 U      | --      | <1 U   | --      | <3 U   | --      | <1 U   | --      | NM     | --      |
| Other                      |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |           |           |           |           |           |           |           |           |           |         |        |         |        |         |        |         |        |         |
| CHLORIDE (mg/l)            | 16887-00-6 | 250,000 (E)                                      | 250,000 (E)                                         | 50 (FF)                                                      | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --      | NM     | --      | NM     | --      | NM     | --      | NM     | --      |
| NITROGEN (mg/l)            | 7727-37-9  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --      | NM     | --      | NM     | --      | NM     | --      | NM     | --      |
| HYDROCARBONS, TOTAL (mg/l) | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1 U      | --        | <1 U      | --        | <1 U      | --        | <1 U      | --        | <1 U      | --      | 2.5    | --      | 22     | --      | NM     | --      | NM     | --      |
| Water Quality Parameters   |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |           |           |           |           |           |           |           |           |           |         |        |         |        |         |        |         |        |         |
| TEMPERATURE (°C)           | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --      | NM     | --      | NM     | --      | NM     | --      | NM     | --      |
| CONDUCTIVITY (mS/cm)       | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --      | NM     | --      | NM     | --      | NM     | --      | NM     | --      |
| DISSOLVED OXYGEN (%)       | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --      | NM     | --      | NM     | --      | NM     | --      | NM     | --      |
| pH                         | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --      | NM     | --      | NM     | --      | NM     | --      | NM     | --      |
| TURBIDITY (nTu)            | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --        | NM        | --        | NM        | --        | NM        | --        | NM        | --      | NM     | --      | NM     | --      | NM     | --      | NM     | --      |

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 5-2  
Summary of Groundwater Analytical Results  
Area A  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code                      |            | EGLE Part 201 Generic Cleanup Criteria           |                                                     |                                                              |                                                                                                |                                                                                                   |                         | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                                         |                                            |                                               |                                               |                                                             | Area A    |         |           |         |           |         |           |         |           |         |           |         |           |         |           |         |           |         |           |         |
|------------------------------------|------------|--------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------|-----------------------------------------------|-----------------------------------------------|-------------------------------------------------------------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|
| Station Name                       | CAS Number | [1]<br>Residential<br>Drinking Water<br>Criteria | [2]<br>Nonresidential<br>Drinking Water<br>Criteria | [3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [4]<br>Residential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [5]<br>Nonresidential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [6]<br>Water Solubility | [8]<br>Shallow<br>Groundwater<br>Residential<br>MSSL                        | [9]<br>Shallow<br>Groundwater<br>Nonresidential<br>MSSL | [10]<br>Groundwater<br>Residential<br>MSSL | [11]<br>Groundwater<br>Residential TS<br>MSSL | [12]<br>Groundwater<br>Nonresidential<br>MSSL | [13]<br>Groundwater<br>Nonresidential<br>MSSL <sub>12</sub> | MW #5     |         |           |         |           |         | MW #6     |         |           |         |           |         | MW #7     |         |           |         | MW #8     |         |           |         |
| Field Sample ID                    |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | MW #5     |         | MW #5     |         | MW-5      |         | MW #6     |         | MW #6     |         | MW-6      |         | MW #7     |         | MW #7     |         | MW #8     |         | MW-8      |         |
| Sample Date                        |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 4/19/1990 |         | 10/3/1990 |         | 4/23/2008 |         | 4/19/1990 |         | 10/3/1990 |         | 4/23/2008 |         | 4/19/1990 |         | 10/3/1990 |         | 10/3/1990 |         | 4/23/2008 |         |
| Sample Interval (bgs)              |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | --        |         | --        |         | --        |         | --        |         | --        |         | --        |         | --        |         | --        |         | --        |         | --        |         |
|                                    |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | Result    | Exceeds | Result    | Exceeds | Result    | Exceeds | Result    | Exceeds | Result    | Exceeds | Result    | Exceeds | Result    | Exceeds | Result    | Exceeds | Result    | Exceeds | Result    | Exceeds |
| Inorganics - Metals (ug/l)         |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |           |         |           |         |           |         |           |         |           |         |           |         |           |         |           |         |           |         |           |         |
| ARSENIC                            | 7440-38-2  | 10 (A)                                           | 10 (A)                                              | 10                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |
| BARIUM                             | 7440-39-3  | 2,000 (A,B)                                      | 2,000 (A,B)                                         | 200 (B,G)                                                    | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |
| CADMIUM                            | 7440-43-9  | 5.0 (A,B)                                        | 5.0 (A,B)                                           | 1.3 (B,G,X)                                                  | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |
| CALCIUM                            | 7440-70-2  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |
| CHROMIUM                           | 7440-47-3  | 100 (A,B,H)                                      | 100 (A,B,H)                                         | 40 (B,G,H,X)                                                 | NA                                                                                             | NLV                                                                                               | NLV                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |
| COPPER                             | 7440-50-8  | 4.0 (B,E)                                        | 4.0 (B,E)                                           | 14 (B,G)                                                     | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |
| LEAD                               | 7439-92-1  | 4.0 (B,L)                                        | 4.0 (B,L)                                           | 14 (B,G,X)                                                   | NVL                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |
| MAGNESIUM                          | 7439-95-4  | 400,000 (B)                                      | 1,100,000 (B)                                       | NA                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |
| MANGANESE                          | 7439-96-5  | 50 (B,E)                                         | 50 (B,E)                                            | 1,000 (B,G,X)                                                | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |
| MERCURY                            | 7439-97-6  | 2.0 (A,B,Z)                                      | 2.0 (A,B,Z)                                         | 0.0013 (B,Z)                                                 | 56 (B,S,Z)                                                                                     | 56 (B,S,Z)                                                                                        | 56 (B,Z)                | 0.088                                                                       | 0.14                                                    | 1.4                                        | 4.3                                           | 4.3                                           | 8.5                                                         | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |
| POTASSIUM                          | 7440-09-7  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |
| SELENIUM                           | 7782-49-2  | 50 (A,B)                                         | 50 (A,B)                                            | 5 (B)                                                        | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |
| SILVER                             | 7440-22-4  | 34 (B)                                           | 98 (B)                                              | 0.2 (B,M)                                                    | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |
| SODIUM                             | 7440-23-5  | 230,000 (HH)                                     | 350,000                                             | NA                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |
| STRONTIUM                          | 7440-24-6  | 4,600 (B)                                        | 13,000 (B)                                          | 21,000 (B)                                                   | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |
| ZINC                               | 7440-66-6  | 2,400 (B)                                        | 5,000 (B,E)                                         | 63 (B,G)                                                     | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |
| Organics - PCBs as Aroclors (ug/l) |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |           |         |           |         |           |         |           |         |           |         |           |         |           |         |           |         |           |         |           |         |
| TOTAL PCBs                         | 1336-36-6  | 0.5 (A,J,T)                                      | 0.5 (A,J,T)                                         | 0.2 (J,M,T)                                                  | 45 (J,S,T)                                                                                     | 45 (J,S,T)                                                                                        | 44.7 (J,T)              | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |
| Organics - SVOCs (ug/l)            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |           |         |           |         |           |         |           |         |           |         |           |         |           |         |           |         |           |         |           |         |
| 2-METHYLNAPHTHALENE (SVOC)         | 91-57-6S   | 260                                              | 750                                                 | 19                                                           | 25,000 (S)                                                                                     | 25,000 (S)                                                                                        | 24,600                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |
| ACENAPHTHENE                       | 83-32-9    | 1,300                                            | 3,800                                               | 38                                                           | 4,200 (S)                                                                                      | 4,200 (S)                                                                                         | 4,240                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <2 U      | --      | <2 U      | --      | NM        | --      | <2 U      | --      | NM        | --      | <2 U      | --      | <2 U      | --      | <2 U      | --      | NM        | --      |           |         |
| ACENAPHTHYLENE                     | 208-96-8   | 52                                               | 150                                                 | ID                                                           | 3,900 (S)                                                                                      | 3,900 (S)                                                                                         | 3,930                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1 U      | --      | <1 U      | --      | NM        | --      | <1 U      | --      | NM        | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | NM        | --      |           |         |
| ANTHRACENE                         | 120-12-7   | 43 (S)                                           | 43 (S)                                              | ID                                                           | 43 (S)                                                                                         | 43 (S)                                                                                            | 43.4                    | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1 U      | --      | <1 U      | --      | NM        | --      | <1 U      | --      | NM        | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | NM        | --      |           |         |
| BENZO(A)ANTHRACENE                 | 56-55-3    | 2.1 (Q)                                          | 8.5 (Q)                                             | ID                                                           | NLV                                                                                            | NLV                                                                                               | 9.4 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U      | --      | <5 U      | --      | NM        | --      | <5 U      | --      | NM        | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      | NM        | --      |           |         |
| BENZO(A)PYRENE                     | 50-32-8    | 5.0 (A,Q)                                        | 5.0 (A,Q)                                           | ID                                                           | NLV                                                                                            | NLV                                                                                               | 1.62 (Q)                | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U      | --      | <5 U      | --      | NM        | --      | <5 U      | --      | NM        | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      | NM        | --      |           |         |
| BENZO(B)FLUORANTHENE               | 205-99-2   | 1.5 (Q,S,AA)                                     | 1.5 (Q,S,AA)                                        | ID                                                           | ID                                                                                             | ID                                                                                                | 1.5 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U      | --      | <5 U      | --      | NM        | --      | <5 U      | --      | NM        | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      | NM        | --      |           |         |
| BENZO(G,H,I)PERYLENE               | 191-24-2   | 1.0 (M)                                          | 1.0 (M)                                             | ID                                                           | NLV                                                                                            | NLV                                                                                               | 0.26                    | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <10 U     | --      | <10 U     | --      | NM        | --      | <10 U     | --      | NM        | --      | <10 U     | --      | <10 U     | --      | <10 U     | --      | NM        | --      |           |         |
| BENZO(K)FLUORANTHENE               | 207-08-9   | 1.0 (M,Q)                                        | 1.0 (M,Q)                                           | NA                                                           | NLV                                                                                            | NLV                                                                                               | 0.8 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U      | --      | <5 U      | --      | NM        | --      | <5 U      | --      | NM        | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      | NM        | --      |           |         |
| CHRYSENE                           | 218-01-9   | 1.6 (Q,S)                                        | 1.6 (Q,S)                                           | ID                                                           | ID                                                                                             | ID                                                                                                | 1.6 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U      | --      | <5 U      | --      | NM        | --      | <5 U      | --      | NM        | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      | NM        | --      |           |         |
| FLUORANTHENE                       | 206-44-0   | 210 (S)                                          | 210 (S)                                             | 1.6                                                          | 210 (S)                                                                                        | 210 (S)                                                                                           | 206                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1 U      | --      | <1 U      | --      | NM        | --      | <1 U      | --      | NM        | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | NM        | --      |           |         |
| FLUORENE                           | 86-73-7    | 880                                              | 2,000 (S)                                           | 12                                                           | 2,000 (S)                                                                                      | 2,000 (S)                                                                                         | 1,980                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <2 U      | --      | <2 U      | --      | NM        | --      | <2 U      | --      | 6         | --      | NM        | --      | <2 U      | --      | <2 U      | --      | NM        | --      |           |         |
| INDENO(1,2,3-CD)PYRENE             | 193-39-5   | 2.0 (M,Q)                                        | 2.0 (M,Q)                                           | ID                                                           | NLV                                                                                            | NLV                                                                                               | 0.022 (Q)               | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <10 U     | --      | <10 U     | --      | NM        | --      | <10 U     | --      | <10 U     | --      | NM        | --      | <10 U     | --      | <10 U     | --      | <10 U     | --      |           |         |
| NAPHTHALENE (SVOC)                 | 91-20-3S   | 520                                              | 1,500                                               | 11                                                           | 31,000 (S)                                                                                     | 31,000 (S)                                                                                        | 31,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1 U      | --      | <1 U      | --      | NM        | --      | <1 U      | --      | 100       | [3]     | NM        | --      | <1 U      | --      | <1 U      | --      | NM        | --      |           |         |
| PENTACHLOROPHENOL                  | 87-86-5    | 1.0 (A)                                          | 1.0 (A)                                             | 1.8 (G,X)                                                    | NLV                                                                                            | NLV                                                                                               | 1.85E+06                | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |
| PHENANTHRENE                       | 85-01-8    | 52                                               | 150                                                 | 2.0 (M)                                                      | 1,000 (S)                                                                                      | 1,000 (S)                                                                                         | 1,000                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1 U      | --      | <1 U      | --      | NM        | --      | <1 U      | --      | 6         | [3]     | NM        | --      | <1 U      | --      | 3         | [3]     | <1 U      | --      |           |         |
| PYRENE                             | 129-00-0   | 140 (S)                                          | 140 (S)                                             | ID                                                           | 140 (S)                                                                                        | 140 (S)                                                                                           | 135                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1 U      | --      | <1 U      | --      | NM        | --      | <1 U      | --      | <1 U      | --      | NM        | --      | <1 U      | --      | 2         | --      | 3         | --      |           |         |

Note: Analytical and Criteria Footnotes are included on the last page of the table.



TABLE 5-2  
Summary of Groundwater Analytical Results  
Area A  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code              |            | EGLE Part 201 Generic Cleanup Criteria           |                                                     |                                                              |                                                                                                |                                                                                                   |                         | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                                         |                                            |                                               |                                               |                                                             | Area A    |         |           |         |           |         |                          |         |           |         |           |         |           |         |           |         |           |         |           |         |
|----------------------------|------------|--------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------|-----------------------------------------------|-----------------------------------------------|-------------------------------------------------------------|-----------|---------|-----------|---------|-----------|---------|--------------------------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|
| Station Name               | CAS Number | [1]<br>Residential<br>Drinking Water<br>Criteria | [2]<br>Nonresidential<br>Drinking Water<br>Criteria | [3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [4]<br>Residential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [5]<br>Nonresidential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [6]<br>Water Solubility | [8]<br>Shallow<br>Groundwater<br>Residential<br>MSSL                        | [9]<br>Shallow<br>Groundwater<br>Nonresidential<br>MSSL | [10]<br>Groundwater<br>Residential<br>MSSL | [11]<br>Groundwater<br>Residential TS<br>MSSL | [12]<br>Groundwater<br>Nonresidential<br>MSSL | [13]<br>Groundwater<br>Nonresidential<br>MSSL <sub>12</sub> | MW #5     |         |           |         | MW #6     |         |                          |         | MW #7     |         |           |         | MW #8     |         |           |         |           |         |           |         |
| Field Sample ID            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | MW #5     |         | MW #5     |         | MW-5      |         | MW #6                    |         | MW #6     |         | MW-6      |         | MW #7     |         | MW #7     |         | MW #8     |         | MW-8      |         |
| Sample Date                |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 4/19/1990 |         | 10/3/1990 |         | 4/23/2008 |         | 4/19/1990                |         | 10/3/1990 |         | 4/23/2008 |         | 4/19/1990 |         | 10/3/1990 |         | 10/3/1990 |         | 4/23/2008 |         |
| Sample Interval (bgs)      |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | --        |         | --        |         | --        |         | --                       |         | --        |         | --        |         | --        |         | --        |         | --        |         | --        |         |
|                            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | Result    | Exceeds | Result    | Exceeds | Result    | Exceeds | Result                   | Exceeds | Result    | Exceeds | Result    | Exceeds | Result    | Exceeds | Result    | Exceeds | Result    | Exceeds | Result    | Exceeds |
| Organics - VOCs (ug/l)     |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |           |         |           |         |           |         |                          |         |           |         |           |         |           |         |           |         |           |         |           |         |
| 1,1,1-TRICHLOROETHANE      | 71-55-6    | 200 (A)                                          | 200 (A)                                             | 89                                                           | 660,000                                                                                        | 1,300,000 (S)                                                                                     | 1,330,000               | 180                                                                         | 500                                                     | 8,600                                      | 8,600                                         | 24,000                                        | 24,000                                                      | <1 U      | --      | <1 U      | --      | <1 UJ     | --      | <10 U                    | --      | <1 U      | --      | <1 UJ     | --      | <1 U      | --      | <1 U      | --      | <1 UJ     | --      |           |         |
| 1,2,3-TRIMETHYLBENZENE     | 526-73-8   | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | 43 (JT)                                                                     | 67 (JT)                                                 | 800 (JT)                                   | 2,400 (JT)                                    | 2,300 (JT)                                    | 4,700 (JT)                                                  | NM        | --      | NM        | --      | <1 U      | --      | NM                       | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | <1 U      | --      |           |         |
| 1,2,4-TRIMETHYLBENZENE     | 95-63-6    | 63 (E,I)                                         | 63 (E,I)                                            | 17 (I)                                                       | 56,000 (I,S)                                                                                   | 56,000 (I,S)                                                                                      | 55,890 (I)              | 25 (JT)                                                                     | 44 (JT)                                                 | 440 (JT)                                   | 1,300 (JT)                                    | 1,300 (JT)                                    | 2,600 (JT)                                                  | NM        | --      | NM        | --      | <1 U      | --      | NM                       | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | <1 U      | --      |           |         |
| 1,3,5-TRIMETHYLBENZENE     | 108-67-8   | 72 (E,I)                                         | 72 (E,I)                                            | 45 (I)                                                       | 61,000 (I,S)                                                                                   | 61,000 (I,S)                                                                                      | 61,150 (I)              | 18 (JT)                                                                     | 30 (JT)                                                 | 310 (JT)                                   | 940 (JT)                                      | 920 (JT)                                      | 1,800 (JT)                                                  | NM        | --      | NM        | --      | <1 U      | --      | NM                       | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | <1 U      | --      |           |         |
| 2-METHYLNAPHTHALENE (VOC)  | 91-57-6V   | 260                                              | 750                                                 | 19                                                           | 25,000 (S)                                                                                     | 25,000 (S)                                                                                        | 24,600                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | <5 U      | --      | NM                       | --      | NM        | --      | <5 U      | --      | NM        | --      | NM        | --      | <5 U      | --      |           |         |
| ACETONE                    | 67-64-1    | 730 (I)                                          | 2100 (I)                                            | 1700 (I)                                                     | 1.0E+9 (D,I,S)                                                                                 | 1.0E+9 (D,I,S)                                                                                    | 1.0E+9 (I)              | 50,000                                                                      | 62,000                                                  | 1.20E+07                                   | 1.20E+07                                      | 2.50E+07                                      | 2.50E+07                                                    | NM        | --      | NM        | --      | <20 U     | --      | NM                       | --      | NM        | --      | <20 U     | --      | NM        | --      | NM        | --      | <20 U     | --      |           |         |
| BENZENE                    | 71-43-2    | 5.0 (A,I)                                        | 5.0 (A,I)                                           | 12 (I,X)                                                     | 5,600 (I)                                                                                      | 35,000 (I)                                                                                        | 1,750,000 (I)           | 1                                                                           | 2.7                                                     | 14                                         | 82                                            | 66                                            | 130                                                         | <1 U      | --      | <1 U      | --      | <1 U      | --      | 100 [1,2,3,8,9,10,11,12] | <5 U    | --        | <1 U    | --        | <1 U    | --        | <5 U    | --        | <5 U    | --        | <1 U    | --        |         |
| CYCLOHEXANE                | 110-82-7   | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | <5 U      | --      | NM                       | --      | NM        | --      | <5 U      | --      | NM        | --      | NM        | --      | <5 U      | --      |           |         |
| ETHYLBENZENE               | 100-41-4   | 74 (E,I)                                         | 74 (E,I)                                            | 18 (I)                                                       | 110,000 (I)                                                                                    | 170,000 (I,S)                                                                                     | 169,000 (I)             | 2.8                                                                         | 7.6                                                     | 45                                         | 450                                           | 210                                           | 420                                                         | <1 U      | --      | <1 U      | --      | <1 U      | --      | 280 [1,2,3,8,9,10,12]    | <5 U    | --        | <1 U    | --        | <1 U    | --        | <5 U    | --        | <5 U    | --        | <1 U    | --        |         |
| HEXANE                     | 110-54-3   | 3,000                                            | 8,600                                               | NA                                                           | 12,000 (S)                                                                                     | 12,000 (S)                                                                                        | 12,000                  | 29                                                                          | 85                                                      | 29 (GW)                                    | 33                                            | 85 (GW)                                       | 170 (GW)                                                    | NM        | --      | NM        | --      | NM        | --      | NM                       | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |
| ISOPROPYLBENZENE           | 98-82-8    | 800                                              | 2,300                                               | 28                                                           | 56,000 (S)                                                                                     | 56,000 (S)                                                                                        | 56,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | <1 U      | --      | NM                       | --      | NM        | --      | <1 U      | --      | NM        | --      | NM        | --      | <1 U      | --      |           |         |
| M,P-XYLENE                 | 1330-20-7  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | <2 U      | --      | NM                       | --      | NM        | --      | <2 U      | --      | NM        | --      | NM        | --      | <2 U      | --      |           |         |
| NAPHTHALENE (VOC)          | 91-20-3V   | 520                                              | 1,500                                               | 11                                                           | 31,000 (S)                                                                                     | 31,000 (S)                                                                                        | 31,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | <5 U      | --      | NM                       | --      | NM        | --      | <5 U      | --      | NM        | --      | NM        | --      | <5 U      | --      |           |         |
| N-PROPYLBENZENE            | 103-65-1   | 80 (I)                                           | 230 (I)                                             | ID                                                           | ID                                                                                             | ID                                                                                                | NA                      | 43                                                                          | 83                                                      | 4100                                       | 12000                                         | 8100                                          | 8100                                                        | NM        | --      | NM        | --      | <1 U      | --      | NM                       | --      | NM        | --      | <1 U      | --      | NM        | --      | NM        | --      | <1 U      | --      |           |         |
| O-XYLENE                   | 95-47-6    | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | <1 U      | --      | NM                       | --      | NM        | --      | <1 U      | --      | NM        | --      | NM        | --      | <1 U      | --      |           |         |
| TETRACHLOROETHYLENE        | 127-18-4   | 5.0 (A)                                          | 5.0 (A)                                             | 11 (X)                                                       | 25,000                                                                                         | 170,000                                                                                           | 200,000                 | 1.5                                                                         | 3                                                       | 96                                         | 96                                            | 190                                           | 380                                                         | <1 U      | --      | 1.9 [8]   | <1 U    | --        | <10 U   | --                       | <1 U    | --        | <1 U    | --        | <1 U    | --        | <1 U    | --        | <1 U    | --        | <1 U    | --        |         |
| TOLUENE                    | 108-88-3   | 790 (E,I)                                        | 790 (E,I)                                           | 270 (I)                                                      | 530,000 (I,S)                                                                                  | 530,000 (I,S)                                                                                     | 526,000 (I)             | 300                                                                         | 570                                                     | 23,000                                     | 33,000                                        | 66,000                                        | 66,000                                                      | <1 U      | --      | <1 U      | --      | <1 U      | --      | 90                       | --      | <5 U      | --      | <1 U      | --      | <1 U      | --      | <5 U      | --      | <5 U      | --      | <1 U      | --      |
| TRICHLOROETHYLENE          | 79-01-6    | 5.0 (A)                                          | 5.0 (A)                                             | 29 (X)                                                       | 2,200                                                                                          | 4,900                                                                                             | 1,100,000               | 0.073 (M)                                                                   | 0.14 (M)                                                | 6.1                                        | 18                                            | 12                                            | 24                                                          | <1 U      | --      | 2.2 [8,9] | <1 U    | --        | <10 U   | --                       | <1 U    | --        | <1 U    | --        | <1 U    | --        | <1 U    | --        | <1 U    | --        | <1 U    | --        |         |
| XYLENE - TOTAL             | 1330-20-7  | 280 (E,I)                                        | 280 (E,I)                                           | 49 (I)                                                       | 190,000 (I,S)                                                                                  | 190,000 (I,S)                                                                                     | 186,000 (I)             | 75 (J)                                                                      | 120 (J)                                                 | 1,200 (J)                                  | 3,600 (J)                                     | 3,500 (J)                                     | 7,100 (J)                                                   | <3 U      | --      | <1 U      | --      | NM        | --      | 2,000 [1,2,3,8,9,10]     | <5 U    | --        | NM      | --        | 6       | --        | <5 U    | --        | <5 U    | --        | NM      | --        |         |
| Other                      |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |           |         |           |         |           |         |                          |         |           |         |           |         |           |         |           |         |           |         |           |         |
| CHLORIDE (mg/l)            | 16887-00-6 | 250,000 (E)                                      | 250,000 (E)                                         | 50 (FF)                                                      | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM                       | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |
| NITROGEN (mg/l)            | 7727-37-9  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM                       | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |
| HYDROCARBONS, TOTAL (mg/l) | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 5.1       | --      | <1 U      | --      | NM        | --      | 23                       | --      | 1,020     | --      | NM        | --      | 16        | --      | 22        | --      | 40        | --      | NM        | --      |
| Water Quality Parameters   |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |           |         |           |         |           |         |                          |         |           |         |           |         |           |         |           |         |           |         |           |         |
| TEMPERATURE (°C)           | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM                       | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |
| CONDUCTIVITY (mS/cm)       | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM                       | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |
| DISSOLVED OXYGEN (%)       | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM                       | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |
| pH                         | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM                       | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |
| TURBIDITY (nTu)            | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM                       | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |           |         |

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 5-2  
Summary of Groundwater Analytical Results  
Area A  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code                      |            | EGLE Part 201 Generic Cleanup Criteria           |                                                     |                                                              |                                                                                                |                                                                                                   |                         | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                                         |                                            |                                               |                                               |                                                             | Area A    |         |           |         |                       |         |           |         |                       |         |             |               |
|------------------------------------|------------|--------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------|-----------------------------------------------|-----------------------------------------------|-------------------------------------------------------------|-----------|---------|-----------|---------|-----------------------|---------|-----------|---------|-----------------------|---------|-------------|---------------|
| Station Name                       | CAS Number | [1]<br>Residential<br>Drinking Water<br>Criteria | [2]<br>Nonresidential<br>Drinking Water<br>Criteria | [3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [4]<br>Residential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [5]<br>Nonresidential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [6]<br>Water Solubility | [8]<br>Shallow<br>Groundwater<br>Residential<br>MSSL                        | [9]<br>Shallow<br>Groundwater<br>Nonresidential<br>MSSL | [10]<br>Groundwater<br>Residential<br>MSSL | [11]<br>Groundwater<br>Residential TS<br>MSSL | [12]<br>Groundwater<br>Nonresidential<br>MSSL | [13]<br>Groundwater<br>Nonresidential<br>MSSL <sub>12</sub> | MW #9     |         | MW #10    |         | Open Ditch to Channel |         | MW-113    |         |                       |         |             |               |
| Field Sample ID                    |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | MW #9     |         | MW-9      |         | MW #10                |         | MW-10     |         | Open Ditch to Channel |         | 7728 MW-113 |               |
| Sample Date                        |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 10/3/1990 |         | 4/23/2008 |         | 10/3/1990             |         | 4/23/2008 |         | 10/3/1990             |         | 3/6/1997    |               |
| Sample Interval (bgs)              |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | --        |         | --        |         | --                    |         | --        |         | --                    |         | --          |               |
|                                    |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | Result    | Exceeds | Result    | Exceeds | Result                | Exceeds | Result    | Exceeds | Result                | Exceeds | Result      | Exceeds       |
| Inorganics - Metals (ug/l)         |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |           |         |           |         |                       |         |           |         |                       |         |             |               |
| ARSENIC                            | 7440-38-2  | 10 (A)                                           | 10 (A)                                              | 10                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM                    | --      | NM        | --      | NM                    | --      |             |               |
| BARIUM                             | 7440-39-3  | 2,000 (A,B)                                      | 2,000 (A,B)                                         | 200 (B,G)                                                    | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM                    | --      | NM        | --      | NM                    | --      |             |               |
| CADMIUM                            | 7440-43-9  | 5.0 (A,B)                                        | 5.0 (A,B)                                           | 1.3 (B,G,X)                                                  | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM                    | --      | NM        | --      | NM                    | --      |             |               |
| CALCIUM                            | 7440-70-2  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM                    | --      | NM        | --      | NM                    | --      |             |               |
| CHROMIUM                           | 7440-47-3  | 100 (A,B,H)                                      | 100 (A,B,H)                                         | 40 (B,G,H,X)                                                 | NA                                                                                             | NLV                                                                                               | NLV                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM                    | --      | NM        | --      | NM                    | --      |             |               |
| COPPER                             | 7440-50-8  | 4.0 (B,E)                                        | 4.0 (B,E)                                           | 14 (B,G)                                                     | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM                    | --      | NM        | --      | NM                    | --      |             |               |
| LEAD                               | 7439-92-1  | 4.0 (B,L)                                        | 4.0 (B,L)                                           | 14 (B,G,X)                                                   | NVL                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM                    | --      | NM        | --      | 3.0                   | --      |             |               |
| MAGNESIUM                          | 7439-95-4  | 400,000 (B)                                      | 1,100,000 (B)                                       | NA                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM                    | --      | NM        | --      | NM                    | --      |             |               |
| MANGANESE                          | 7439-96-5  | 50 (B,E)                                         | 50 (B,E)                                            | 1,000 (B,G,X)                                                | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM                    | --      | NM        | --      | NM                    | --      |             |               |
| MERCURY                            | 7439-97-6  | 2.0 (A,B,Z)                                      | 2.0 (A,B,Z)                                         | 0.0013 (B,Z)                                                 | 56 (B,S,Z)                                                                                     | 56 (B,S,Z)                                                                                        | 56 (B,Z)                | 0.088                                                                       | 0.14                                                    | 1.4                                        | 4.3                                           | 4.3                                           | 8.5                                                         | NM        | --      | NM        | --      | NM                    | --      | NM        | --      | NM                    | --      |             |               |
| POTASSIUM                          | 7440-09-7  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM                    | --      | NM        | --      | NM                    | --      |             |               |
| SELENIUM                           | 7782-49-2  | 50 (A,B)                                         | 50 (A,B)                                            | 5 (B)                                                        | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM                    | --      | NM        | --      | NM                    | --      |             |               |
| SILVER                             | 7440-22-4  | 34 (B)                                           | 98 (B)                                              | 0.2 (B,M)                                                    | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM                    | --      | NM        | --      | NM                    | --      |             |               |
| SODIUM                             | 7440-23-5  | 230,000 (HH)                                     | 350,000                                             | NA                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM                    | --      | NM        | --      | NM                    | --      |             |               |
| STRONTIUM                          | 7440-24-6  | 4,600 (B)                                        | 13,000 (B)                                          | 21,000 (B)                                                   | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM                    | --      | NM        | --      | NM                    | --      |             |               |
| ZINC                               | 7440-66-6  | 2,400 (B)                                        | 5,000 (B,E)                                         | 63 (B,G)                                                     | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM                    | --      | NM        | --      | NM                    | --      |             |               |
| Organics - PCBs as Aroclors (ug/l) |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |           |         |           |         |                       |         |           |         |                       |         |             |               |
| TOTAL PCBs                         | 1336-36-6  | 0.5 (A,J,T)                                      | 0.5 (A,J,T)                                         | 0.2 (J,M,T)                                                  | 45 (J,S,T)                                                                                     | 45 (J,S,T)                                                                                        | 44.7 (J,T)              | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM                    | --      | NM        | --      | NM                    | --      |             |               |
| Organics - SVOCs (ug/l)            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |           |         |           |         |                       |         |           |         |                       |         |             |               |
| 2-METHYLNAPHTHALENE (SVOC)         | 91-57-6S   | 260                                              | 750                                                 | 19                                                           | 25,000 (S)                                                                                     | 25,000 (S)                                                                                        | 24,600                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM                    | --      | NM        | --      | NM                    | --      |             |               |
| ACENAPHTHENE                       | 83-32-9    | 1,300                                            | 3,800                                               | 38                                                           | 4,200 (S)                                                                                      | 4,200 (S)                                                                                         | 4,240                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <2 U      | --      | NM        | --      | <2 U                  | --      | NM        | --      | <2 U                  | --      | 51          | [3]           |
| ACENAPHTHYLENE                     | 208-96-8   | 52                                               | 150                                                 | ID                                                           | 3,900 (S)                                                                                      | 3,900 (S)                                                                                         | 3,930                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1 U      | --      | NM        | --      | <1 U                  | --      | NM        | --      | <1 U                  | --      | <25 U       | --            |
| ANTHRACENE                         | 120-12-7   | 43 (S)                                           | 43 (S)                                              | ID                                                           | 43 (S)                                                                                         | 43 (S)                                                                                            | 43.4                    | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1 U      | --      | NM        | --      | <1 U                  | --      | NM        | --      | <1 U                  | --      | 97          | [1,2,4,5,6]   |
| BENZO(A)ANTHRACENE                 | 56-55-3    | 2.1 (Q)                                          | 8.5 (Q)                                             | ID                                                           | NLV                                                                                            | NLV                                                                                               | 9.4 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U      | --      | NM        | --      | <5 U                  | --      | NM        | --      | <5 U                  | --      | 120         | [1,2,6]       |
| BENZO(A)PYRENE                     | 50-32-8    | 5.0 (A,Q)                                        | 5.0 (A,Q)                                           | ID                                                           | NLV                                                                                            | NLV                                                                                               | 1.62 (Q)                | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U      | --      | NM        | --      | <5 U                  | --      | NM        | --      | <5 U                  | --      | 92          | [1,2,6]       |
| BENZO(B)FLUORANTHENE               | 205-99-2   | 1.5 (Q,S,AA)                                     | 1.5 (Q,S,AA)                                        | ID                                                           | ID                                                                                             | ID                                                                                                | 1.5 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U      | --      | NM        | --      | <5 U                  | --      | NM        | --      | <5 U                  | --      | 180         | [1,2,6]       |
| BENZO(G,H,I)PERYLENE               | 191-24-2   | 1.0 (M)                                          | 1.0 (M)                                             | ID                                                           | NLV                                                                                            | NLV                                                                                               | 0.26                    | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <10 U     | --      | NM        | --      | <10 U                 | --      | NM        | --      | <10 U                 | --      | <25 U       | --            |
| BENZO(K)FLUORANTHENE               | 207-08-9   | 1.0 (M,Q)                                        | 1.0 (M,Q)                                           | NA                                                           | NLV                                                                                            | NLV                                                                                               | 0.8 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U      | --      | NM        | --      | <5 U                  | --      | NM        | --      | <5 U                  | --      | <25 U       | --            |
| CHRYSENE                           | 218-01-9   | 1.6 (Q,S)                                        | 1.6 (Q,S)                                           | ID                                                           | ID                                                                                             | ID                                                                                                | 1.6 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U      | --      | NM        | --      | <5 U                  | --      | NM        | --      | <5 U                  | --      | 110         | [1,2,6]       |
| FLUORANTHENE                       | 206-44-0   | 210 (S)                                          | 210 (S)                                             | 1.6                                                          | 210 (S)                                                                                        | 210 (S)                                                                                           | 206                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1 U      | --      | NM        | --      | <1 U                  | --      | NM        | --      | <1 U                  | --      | 230         | [1,2,3,4,5,6] |
| FLUORENE                           | 86-73-7    | 880                                              | 2,000 (S)                                           | 12                                                           | 2,000 (S)                                                                                      | 2,000 (S)                                                                                         | 1,980                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <2 U      | --      | NM        | --      | <2 U                  | --      | NM        | --      | <2 U                  | --      | 96          | [3]           |
| INDENO(1,2,3-CD)PYRENE             | 193-39-5   | 2.0 (M,Q)                                        | 2.0 (M,Q)                                           | ID                                                           | NLV                                                                                            | NLV                                                                                               | 0.022 (Q)               | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <10 U     | --      | NM        | --      | <10 U                 | --      | NM        | --      | <10 U                 | --      | <25 U       | --            |
| NAPHTHALENE (SVOC)                 | 91-20-3S   | 520                                              | 1,500                                               | 11                                                           | 31,000 (S)                                                                                     | 31,000 (S)                                                                                        | 31,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1 U      | --      | NM        | --      | <1 U                  | --      | NM        | --      | <1 U                  | --      | 180         | [3]           |
| PENTACHLOROPHENOL                  | 87-86-5    | 1.0 (A)                                          | 1.0 (A)                                             | 1.8 (G,X)                                                    | NLV                                                                                            | NLV                                                                                               | 1.85E+06                | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM                    | --      | NM        | --      | NM                    | --      | NM          | --            |
| PHENANTHRENE                       | 85-01-8    | 52                                               | 150                                                 | 2.0 (M)                                                      | 1,000 (S)                                                                                      | 1,000 (S)                                                                                         | 1,000                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1 U      | --      | NM        | --      | <1 U                  | --      | NM        | --      | <1 U                  | --      | 280         | [1,2,3]       |
| PYRENE                             | 129-00-0   | 140 (S)                                          | 140 (S)                                             | ID                                                           | 140 (S)                                                                                        | 140 (S)                                                                                           | 135                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1 U      | --      | NM        | --      | <1 U                  | --      | NM        | --      | <1 U                  | --      | 200         | [1,2,4,5,6]   |

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 5-2  
Summary of Groundwater Analytical Results  
Area A  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code              |            | EGLE Part 201 Generic Cleanup Criteria           |                                                     |                                                              |                                                                                                |                                                                                                   |                         | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                                         |                                            |                                               |                                               |                                                             | Area A    |           |           |         |                       |         |           |         |                       |         |             |         |
|----------------------------|------------|--------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------|-----------------------------------------------|-----------------------------------------------|-------------------------------------------------------------|-----------|-----------|-----------|---------|-----------------------|---------|-----------|---------|-----------------------|---------|-------------|---------|
| Station Name               | CAS Number | [1]<br>Residential<br>Drinking Water<br>Criteria | [2]<br>Nonresidential<br>Drinking Water<br>Criteria | [3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [4]<br>Residential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [5]<br>Nonresidential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [6]<br>Water Solubility | [8]<br>Shallow<br>Groundwater<br>Residential<br>MSSL                        | [9]<br>Shallow<br>Groundwater<br>Nonresidential<br>MSSL | [10]<br>Groundwater<br>Residential<br>MSSL | [11]<br>Groundwater<br>Residential TS<br>MSSL | [12]<br>Groundwater<br>Nonresidential<br>MSSL | [13]<br>Groundwater<br>Nonresidential<br>MSSL <sub>12</sub> | MW #9     |           | MW #10    |         | Open Ditch to Channel |         | MW-113    |         |                       |         |             |         |
| Field Sample ID            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | MW #9     |           | MW-9      |         | MW #10                |         | MW-10     |         | Open Ditch to Channel |         | 7728 MW-113 |         |
| Sample Date                |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 10/3/1990 |           | 4/23/2008 |         | 10/3/1990             |         | 4/23/2008 |         | 10/3/1990             |         | 3/6/1997    |         |
| Sample Interval (bgs)      |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | --        |           | --        |         | --                    |         | --        |         | --                    |         | --          |         |
|                            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | Result    | Exceeds   | Result    | Exceeds | Result                | Exceeds | Result    | Exceeds | Result                | Exceeds | Result      | Exceeds |
| Organics - VOCs (ug/l)     |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |           |           |           |         |                       |         |           |         |                       |         |             |         |
| 1,1,1-TRICHLOROETHANE      | 71-55-6    | 200 (A)                                          | 200 (A)                                             | 89                                                           | 660,000                                                                                        | 1,300,000 (S)                                                                                     | 1,330,000               | 180                                                                         | 500                                                     | 8,600                                      | 8,600                                         | 24,000                                        | 24,000                                                      | <1 U      | --        | <1 UJ     | --      | <1 U                  | --      | <1 UJ     | --      |                       |         |             |         |
| 1,2,3-TRIMETHYLBENZENE     | 526-73-8   | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | 43 (JT)                                                                     | 67 (JT)                                                 | 800 (JT)                                   | 2,400 (JT)                                    | 2,300 (JT)                                    | 4,700 (JT)                                                  | NM        | --        | <1 U      | --      | NM                    | --      | <1 U      | --      |                       |         |             |         |
| 1,2,4-TRIMETHYLBENZENE     | 95-63-6    | 63 (E,I)                                         | 63 (E,I)                                            | 17 (I)                                                       | 56,000 (I,S)                                                                                   | 56,000 (I,S)                                                                                      | 55,890 (I)              | 25 (JT)                                                                     | 44 (JT)                                                 | 440 (JT)                                   | 1,300 (JT)                                    | 1,300 (JT)                                    | 2,600 (JT)                                                  | NM        | --        | <1 U      | --      | NM                    | --      | <1 U      | --      |                       |         |             |         |
| 1,3,5-TRIMETHYLBENZENE     | 108-67-8   | 72 (E,I)                                         | 72 (E,I)                                            | 45 (I)                                                       | 61,000 (I,S)                                                                                   | 61,000 (I,S)                                                                                      | 61,150 (I)              | 18 (JT)                                                                     | 30 (JT)                                                 | 310 (JT)                                   | 940 (JT)                                      | 920 (JT)                                      | 1,800 (JT)                                                  | NM        | --        | <1 U      | --      | NM                    | --      | <1 U      | --      |                       |         |             |         |
| 2-METHYLNAPHTHALENE (VOC)  | 91-57-6V   | 260                                              | 750                                                 | 19                                                           | 25,000 (S)                                                                                     | 25,000 (S)                                                                                        | 24,600                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --        | <5 U      | --      | NM                    | --      | <5 U      | --      |                       |         |             |         |
| ACETONE                    | 67-64-1    | 730 (I)                                          | 2100 (I)                                            | 1700 (I)                                                     | 1.0E+9 (D,I,S)                                                                                 | 1.0E+9 (D,I,S)                                                                                    | 1.0E+9 (I)              | 50,000                                                                      | 62,000                                                  | 1.20E+07                                   | 1.20E+07                                      | 2.50E+07                                      | 2.50E+07                                                    | NM        | --        | <20 U     | --      | NM                    | --      | <20 U     | --      |                       |         |             |         |
| BENZENE                    | 71-43-2    | 5.0 (A,I)                                        | 5.0 (A,I)                                           | 12 (I,X)                                                     | 5,600 (I)                                                                                      | 35,000 (I)                                                                                        | 1,750,000 (I)           | 1                                                                           | 2.7                                                     | 14                                         | 82                                            | 66                                            | 130                                                         | 6.2       | [1,2,8,9] | <1 U      | --      | <1 U                  | --      | <1 U      | --      |                       |         |             |         |
| CYCLOHEXANE                | 110-82-7   | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --        | <5 U      | --      | NM                    | --      | <5 U      | --      |                       |         |             |         |
| ETHYLBENZENE               | 100-41-4   | 74 (E,I)                                         | 74 (E,I)                                            | 18 (I)                                                       | 110,000 (I)                                                                                    | 170,000 (I,S)                                                                                     | 169,000 (I)             | 2.8                                                                         | 7.6                                                     | 45                                         | 450                                           | 210                                           | 420                                                         | <1 U      | --        | <1 U      | --      | <1 U                  | --      | <1 U      | --      |                       |         |             |         |
| HEXANE                     | 110-54-3   | 3,000                                            | 8,600                                               | NA                                                           | 12,000 (S)                                                                                     | 12,000 (S)                                                                                        | 12,000                  | 29                                                                          | 85                                                      | 29 (GW)                                    | 33                                            | 85 (GW)                                       | 170 (GW)                                                    | NM        | --        | NM        | --      | NM                    | --      | NM        | --      |                       |         |             |         |
| ISOPROPYLBENZENE           | 98-82-8    | 800                                              | 2,300                                               | 28                                                           | 56,000 (S)                                                                                     | 56,000 (S)                                                                                        | 56,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --        | <1 U      | --      | NM                    | --      | <1 U      | --      |                       |         |             |         |
| M,P-XYLENE                 | 1330-20-7  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --        | <2 U      | --      | NM                    | --      | <2 U      | --      |                       |         |             |         |
| NAPHTHALENE (VOC)          | 91-20-3V   | 520                                              | 1,500                                               | 11                                                           | 31,000 (S)                                                                                     | 31,000 (S)                                                                                        | 31,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --        | <5 U      | --      | NM                    | --      | <5 U      | --      |                       |         |             |         |
| N-PROPYLBENZENE            | 103-65-1   | 80 (I)                                           | 230 (I)                                             | ID                                                           | ID                                                                                             | ID                                                                                                | NA                      | 43                                                                          | 83                                                      | 4100                                       | 12000                                         | 8100                                          | 8100                                                        | NM        | --        | <1 U      | --      | NM                    | --      | <1 U      | --      |                       |         |             |         |
| O-XYLENE                   | 95-47-6    | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --        | <1 U      | --      | NM                    | --      | <1 U      | --      |                       |         |             |         |
| TETRACHLOROETHYLENE        | 127-18-4   | 5.0 (A)                                          | 5.0 (A)                                             | 11 (X)                                                       | 25,000                                                                                         | 170,000                                                                                           | 200,000                 | 1.5                                                                         | 3                                                       | 96                                         | 96                                            | 190                                           | 380                                                         | <1 U      | --        | <1 U      | --      | <1 U                  | --      | <1 U      | --      |                       |         |             |         |
| TOLUENE                    | 108-88-3   | 790 (E,I)                                        | 790 (E,I)                                           | 270 (I)                                                      | 530,000 (I,S)                                                                                  | 530,000 (I,S)                                                                                     | 526,000 (I)             | 300                                                                         | 570                                                     | 23,000                                     | 33,000                                        | 66,000                                        | 66,000                                                      | <1 U      | --        | <1 U      | --      | <1 U                  | --      | <1 U      | --      |                       |         |             |         |
| TRICHLOROETHYLENE          | 79-01-6    | 5.0 (A)                                          | 5.0 (A)                                             | 29 (X)                                                       | 2,200                                                                                          | 4,900                                                                                             | 1,100,000               | 0.073 (M)                                                                   | 0.14 (M)                                                | 6.1                                        | 18                                            | 12                                            | 24                                                          | <1 U      | --        | <1 U      | --      | <1 U                  | --      | <1 U      | --      |                       |         |             |         |
| XYLENE - TOTAL             | 1330-20-7  | 280 (E,I)                                        | 280 (E,I)                                           | 49 (I)                                                       | 190,000 (I,S)                                                                                  | 190,000 (I,S)                                                                                     | 186,000 (I)             | 75 (J)                                                                      | 120 (J)                                                 | 1,200 (J)                                  | 3,600 (J)                                     | 3,500 (J)                                     | 7,100 (J)                                                   | <1 U      | --        | NM        | --      | <1 U                  | --      | <3 U      | --      |                       |         |             |         |
| Other                      |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |           |           |           |         |                       |         |           |         |                       |         |             |         |
| CHLORIDE (mg/l)            | 16887-00-6 | 250,000 (E)                                      | 250,000 (E)                                         | 50 (FF)                                                      | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --        | NM        | --      | NM                    | --      | NM        | --      |                       |         |             |         |
| NITROGEN (mg/l)            | 7727-37-9  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --        | NM        | --      | NM                    | --      | NM        | --      |                       |         |             |         |
| HYDROCARBONS, TOTAL (mg/l) | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 6         | --        | NM        | --      | 30                    | --      | NM        | --      |                       |         |             |         |
| Water Quality Parameters   |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |           |           |           |         |                       |         |           |         |                       |         |             |         |
| TEMPERATURE (°C)           | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --        | NM        | --      | NM                    | --      | NM        | --      |                       |         |             |         |
| CONDUCTIVITY (mS/cm)       | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --        | NM        | --      | NM                    | --      | NM        | --      |                       |         |             |         |
| DISSOLVED OXYGEN (%)       | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --        | NM        | --      | NM                    | --      | NM        | --      |                       |         |             |         |
| pH                         | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --        | NM        | --      | NM                    | --      | NM        | --      |                       |         |             |         |
| TURBIDITY (nTu)            | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --        | NM        | --      | NM                    | --      | NM        | --      |                       |         |             |         |

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 5-2  
Summary of Groundwater Analytical Results  
Area A  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Groundwater Table Footnotes:

- EGLE Part 201 residential and non-residential generic cleanup criteria and screening levels criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Release Date: December 30, 2013. Updated December 21, 2020.

- Only detected analytes are listed - Gray rows indicate requested analyses. If no analytes are listed below a gray row then all analytes of that group were either not analyzed or not detected.

- **Bold** values are concentrations detected above the laboratory reporting limit.

- **Bold/Shaded** cells indicate analyte concentration exceeded applicable criteria. EGLE Part 201 criteria exceeded is indicated by the footnote in [brackets] following the result value and defined below:

|                                                                                   |                                                    |
|-----------------------------------------------------------------------------------|----------------------------------------------------|
| [1] - Residential Drinking Water Criteria                                         | [8] Shallow Groundwater Residential MSSL           |
| [2] - Nonresidential Drinking Water Criteria                                      | [9] Shallow Groundwater Nonresidential MSSL        |
| [3] - Groundwater Surface Water Interface Criteria                                | [10] Groundwater Residential MSSL                  |
| [4] - Water Solubility                                                            | [11] Groundwater Residential TS MSSL               |
| [5] - Residential Groundwater Volatilization to Indoor Air Inhalation Criteria    | [12] Groundwater Nonresidential MSSL               |
| [6] - Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria | [13] Groundwater Nonresidential MSSL <sub>12</sub> |
| [7] - Flammability and Explosivity Screening Level                                | [14] Groundwater Nonresidential TS MSSL            |

Evaluation based on EGLE Criteria at time of Project completion.

|                                       |                                                                                                     |
|---------------------------------------|-----------------------------------------------------------------------------------------------------|
| -- = No Exceedances                   | mg/l = Milligrams per liter                                                                         |
| ND = Not Detected                     | °C = Degrees Celsius                                                                                |
| NM = Not Measured                     | mS/cm = MilliSiemens per centimeter                                                                 |
| bgs = Below ground surface            | % = Percentage                                                                                      |
| ft = Feet                             | nTu = Nephelometric Turbidity Unit                                                                  |
| PCBs = Polychlorinated biphenyls      | pH = pH acid-base scale                                                                             |
| SVOC = Semi-volatile organic compound | MSSL = Media-Specific Volatilization to Indoor Air Interim Action Screening Level                   |
| VOC = Volatile organic compound       | TS MSSL = Time Sensitive Media-Specific Volatilization to Indoor Air Interim Action Screening Level |
| ug/l = Micrograms per liter           |                                                                                                     |

Groundwater Table Footnotes:

ID = Insufficient data to develop criterion.

NA = A criterion or value is not available

NLV = Hazardous substance is not likely to volatilize under most conditions.

(A) = Criterion is the state of Michigan drinking water standard established pursuant to Section 5 of 1976 PA 399, MCL 325.1005.

(AA) = Use 10,000 ug/l where groundwater enters a structure through the use of a water well, sump or other device. Use 28,000 ug/l for all other uses.

(B) = Background, as defined in R 299.1(b), may be substituted if higher than the calculated cleanup criterion. Background levels may be less than criteria for some inorganic compounds.

(D) = Calculated criterion exceeds 100 percent, hence it is reduced to 100 percent or 1.0E+9 parts per billion (ppb).

(E) = Criterion is the aesthetic drinking water value, as required by Section 20120a(5) of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA). A notice of aesthetic impact may be employed as an institutional control mechanism if groundwater concentrations exceed the aesthetic drinking water criterion, but do not exceed the applicable health-based drinking water value provided in a table available on the Department of Environment, Great Lakes, and Energy (EGLE) internet web site. (See R 299.49 Footnotes for generic cleanup criteria tables for additional information)

(FF) = The chloride GSI criterion shall be 125 mg/l when the discharge is to surface waters of the state designated as public water supply sources or 50 mg/l when the discharge is to the Great Lakes or connecting waters. Chloride GSI criteria shall not apply for surface waters of the state that are not designated as a public water supply source, however, the total dissolved solids criterion is applicable.

(G) = Groundwater surface water interface (GSI) criterion depends on the pH or water hardness, or both, of the receiving surface water. The final chronic value (FCV) for the protection of aquatic life shall be calculated based on the pH or hardness of the receiving surface water. Where water hardness exceeds 400 mg CaCO<sub>3</sub>/L, use 400 mg CaCO<sub>3</sub>/L for the FCV calculation. The FCV formula provides values in units of ug/L or ppb. The generic GSI criterion is the lesser of the calculated FCV, the wildlife value (WV), and the surface water human non-drinking water value (HNDV). The soil GSI protection criteria for these hazardous substances are the greater of the 20 times the GSI criterion or the GSI soil-water partition values using the GSI criteria developed with the procedure described in this footnote. A spreadsheet that may be used to calculate GSI and GSI protection criteria for (G)-footnoted hazardous substances is available on the Department of Environment, Great Lakes, and Energy (EGLE) internet web site. A hardness value of 47.5 CaCO<sub>3</sub>/L and pH of 7, derived from the Michigan Department of Environmental Quality Draft Site Inspection Report for Lake Linden Operations dated 3/29/13, was used in the footnote G calculation spreadsheet.

(H) = Valence-specific chromium data (Cr III and Cr VI) shall be compared to the corresponding valence-specific cleanup criteria. If both Cr III and Cr VI are present in groundwater, the total concentration of both cannot exceed the drinking water criterion of 100 ug/L. If analytical data are provided for total chromium only, they shall be compared to the cleanup criteria for Cr VI. Cr III soil cleanup criterion for protection of drinking water can only be used at sites where groundwater is prevented from being used as a public water supply, currently and in the future, through an approved land or resource use restriction.

(HH) = The residential criterion for sodium is 230,000 ug/l in accordance with the Sodium Advisory Council recommendation and revised Groundwater Discharge Standards.

(I) = Hazardous substance may exhibit the characteristic of ignitability as defined in 40 C.F.R. §261.21 (revised as of July 1, 2001), which is adopted by reference in these rules and is available for inspection at EGLE, 525 West Allegan Street, Lansing, Michigan. Copies of the regulation may be purchased, at a cost as of the time of adoption of these rules of \$45, from the Superintendent of documents, Government Printing Office, Washington, DC 20401 (stock number 869-044-00155-1), or from the EGLE, Remediation and Redevelopment Division (RRD), 525 West Allegan Street, Lansing, Michigan 48933, at cost.

(J) = Hazardous substance may be present in several isomer forms. Isomer-specific concentrations shall be added together for comparison to criteria.

(L) = Criteria for lead are derived using a biologically based model, as allowed for under Section 20120a(9) of the NREPA, and are not calculated using the algorithms and assumptions specified in pathway-specific rules. The generic residential drinking water criterion of 4 ug/L is linked to the generic residential soil direct contact criterion of 400 mg/kg. A higher concentration in the drinking water, up to the state action level of 15 ug/L, may be allowed as a site-specific remedy and still allow for drinking water use, under Section 20120a(2) and 20120b of the NREPA if soil concentrations are appropriately lower than 400 mg/kg. If a site-specific criterion is approved based on this subdivision, a notice shall be filed on the deed for all property where the groundwater concentrations will exceed 4 ug/L to provide notice of the potential for unacceptable risk if soil or groundwater concentrations increase.

Acceptable combinations of site-specific soil and drinking water concentrations are presented in a table available on the Department of Environment, Great Lakes, and Energy (EGLE) internet web site (See R 299.49 Footnotes for generic cleanup criteria tables for additional information).

(M) = Calculated criterion is below the analytical target detection limit, therefore, the criterion defaults to the target detection limit.

(Q) = Criteria for carcinogenic polycyclic aromatic hydrocarbons were developed using relative potential potencies to benzo(a)pyrene.

(S) = Criterion defaults to the hazardous substance-specific water solubility limit.

(T) = Refer to the federal Toxic Substances Control Act (TSCA), 40 C.F.R. §761, Subpart D and 40 C.F.R. §761, Subpart G, to determine the applicability of TSCA cleanup standards. Subpart D and Subpart G of 40 C.F.R. §761 (July 1, 2001) are adopted by reference in these rules and are available for inspection at the EGLE, 525 West Allegan Street, Lansing, Michigan. Copies of the regulations may be purchased, at a cost as of the time of adoption of these rules of \$55, from the Superintendent of Documents, Government Printing Office, Washington, DC 20401, or from the EGLE, RRD, 525 West Allegan Street, Lansing, Michigan 48933, at cost. Alternatives to compliance with the TSCA standards listed below are possible under 40 C.F.R. §761 Subpart D. New releases may be subject to the standards identified in 40 C.F.R. §761, Subpart G. Use Part 201 soil direct contact cleanup criteria in the published table if TSCA standards are not applicable.

(X) = The GSI criterion shown in the generic cleanup criteria tables is not protective for surface water that is used as a drinking water source. (See R 299.49 Footnotes for generic cleanup criteria tables for additional information.)

(Z) = Mercury is typically measured as total mercury. The generic cleanup criteria, however, are based on data for different species of mercury. Specifically, data for elemental mercury, chemical abstract service (CAS) number 7439976, serve as the basis for the soil volatilization to indoor air criteria, groundwater volatilization to indoor air, and soil inhalation criteria. Data for methyl mercury, CAS number 22967926, serve as the basis for the GSI criterion; and data for mercuric chloride, CAS number 7487947, serve as the basis for the drinking water, groundwater contact, soil direct contact, and the groundwater protection criteria. Comparison to criteria shall be based on species-specific analytical data only if sufficient facility characterization has been conducted to rule out the presence of other species of mercury.

MSSL Footnotes:

GW = The calculated value for a hazardous substance based upon shallow groundwater is considered protective when it is greater than the calculated value for groundwater.

J = Hazardous substance may be present in several isomer forms. Isomer-specific concentrations must be added together for comparison to screening level.

JT = Hazardous substance may be present in several isomer forms. Screening levels may be used for the individual isomer provided that it is the sole isomer detected; however, when multiple isomers are detected in a medium, the isomer-specific concentrations must be added together and compared to the most restrictive screening level of the detected isomers.

Laboratory Footnotes:

U = Analyte analyzed for but not detected above the reported sample reporting limit.

**TABLE 5-2**  
**Summary of Groundwater Analytical Results**  
**Area A**  
**Quincy Mining Company Portage Operations Area**  
**Abandoned Mining Wastes - Torch Lake Non-Superfund Site**

|                                                                                                         | Part 201 Generic Cleanup Criteria Evaluated                                          | Exceedance |
|---------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|------------|
| <b>EGLE Part 201 Generic Cleanup Criteria<br/>(December 2020)</b>                                       | [1] Residential Drinking Water Criteria                                              | YES        |
|                                                                                                         | [2] Nonresidential Drinking Water Criteria                                           | YES        |
|                                                                                                         | [3] Groundwater Surface Water Interface Criteria                                     | YES        |
|                                                                                                         | [4] Residential Groundwater Volatilization to Indoor Air Inhalation Criteria         | YES        |
|                                                                                                         | [5] Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria      | YES        |
|                                                                                                         | [6] Water Solubility                                                                 | YES        |
|                                                                                                         | [7] Flammability and Explosivity Screening                                           | NO         |
| <b>Media-Specific Volatilization to Indoor Air<br/>Interim Action Screening Levels<br/>(March 2021)</b> | [8] Shallow Groundwater Residential Media-Specific Screening Level (MSSL)            | YES        |
|                                                                                                         | [9] Shallow Groundwater Nonresidential MSSL                                          | YES        |
|                                                                                                         | [10] Groundwater Residential MSSL                                                    | YES        |
|                                                                                                         | [11] Groundwater Residential Time Sensitive Media-Specific Screening Level (TS MSSL) | YES        |
|                                                                                                         | [12] Groundwater Nonresidential MSSL                                                 | YES        |
|                                                                                                         | [13] Groundwater Nonresidential MSSL <sub>12</sub>                                   | NO         |
|                                                                                                         | [14] Groundwater Nonresidential TS MSSL <sub>12</sub>                                | NO         |

## 6. DETAILED FINDINGS – AREA B

This Section summarizes the results and the subsequent findings for Area B within QMCP derived from implementation of the SAP. The narrative follows the systematic investigative approach outlined in **Section 3**, while providing specific details about the potential human health and ecological risks associated with the historical mining operations in this subarea of QMCP.

### 6.1 SITE INSPECTION AND INVESTIGATION RESULTS

The implementation of the site inspection and investigation activities provided critical lines of evidence that link the historical documentation and the current environmental conditions in and around the Portage Canal. The following subsections present the findings of the inspection and investigation activities and provide correlation of mining era operations and their potential impacts on the nearshore and offshore environment of the Portage Canal.

#### 6.1.1 Site Inspection

The site inspection at each subarea included the inventory and locating of historical structures and similar surficial artifacts associated with the former industrial operations in the area. Each subarea was also inspected for potential physical and health hazards that were documented, photographed, and located with a GPS unit. The inventoried hazards were then qualitatively assessed for potential human health and environmental risks to determine if analytical sampling was warranted during the targeted inspection phase of the work.

On September 13, 2018, MSG field team personnel performed reconnaissance activities at Area B. In the cases where access was not requested based on historic operational and investigative findings, property conditions were evaluated from a neighboring property or public right of way where access was permitted. Access to Area B was not requested based on historic operational and investigative findings.

Therefore, the property parcel known as the Houghton County Road Commission totaling approximately 10 acres was visually inspected and observations were recorded from the MDNR trail property. The qualitative assessment of the reconnaissance findings in Area B warranted the performance of targeted inspection activities.

##### 6.1.1.1 Reconnaissance

The reconnaissance activities identified one area of potentially oil stained soil that was observed originating from a hole to the north of the MDNR trail property, crossing the trail, and extending down to the edge of the Portage Canal. In addition, a suspect UST was observed along the shoreline. A copy of the reconnaissance log is provided in **Appendix C, Site Inspections – Reconnaissance Logs, Targeted Inspections & Physical Hazards Inventory**.

#### 6.1.2 Site Investigation

The SI in the QMCP was developed based on a variety of data and information as outlined in **Section 3**. In addition to the historical accounts and documentation, current land use and potential exposure pathways were also taken into consideration when selecting the sampling locations specific to Area B. The following subsections present the outcomes of investigative activities completed in Area B by summarizing the laboratory analytical results and characterizing their impacts on the environmental media in which they were detected.

##### 6.1.2.1 Terrestrial Investigation

Intrusive investigation activities in Area B were generally guided by the findings of historical research and field observations. From a historical standpoint, the area was the location of operations subject to or associated with historic

mining practices such as Lake Superior Iron Works and Portage Lake Foundry & Machinery Co., but has also been the location of a Filling Station, residential dwellings, and is currently the location of the Houghton County Road Commission.

Inorganic COCs in the study area were generally understood; however, previous investigative activities did not fully characterize or address organic contaminants in soil and groundwater. The following subsections present a summary of the field observations and analytical results derived from the terrestrial sampling activities.

#### 6.1.2.1.1 Field Observations – Soil and Groundwater

Borings within the MDNR trail property were advanced by GSS to 7 ft bgs. Boring locations are depicted on **Figure 6-1, Soil Analytical Results (Area B)**. Soil observations documented on field logs indicate that the subsurface in the southern portion of Area B on the MDNR trail property is generally comprised of fine to medium brown sand.

During groundwater sampling, temporary well points were established from 3 ft to 7 ft bgs. Saturated soil conditions were encountered at depths of 3 ft bgs. Groundwater quality parameters, including temperature, conductivity, DO, and pH, measured at the time of sample collection were generally considered normal.

#### 6.1.2.1.2 Soil Sampling Results

Terrestrial soil investigation activities were completed at Area B on September 11, 2018. During the mobilization a total of three soil samples were collected from three (3) boring locations. Soil boring locations are depicted on **Figure 6-1, Soil Analytical Results (Area B)**. Investigative methodologies and soil sampling techniques were conducted using the procedures outlined in **Section 3**.

Soil sampling included collection of three (3) samples from 0 to 3 ft in depth. The samples were analyzed for the parameters identified on **Table 3-1, Sampling and Analysis Summary** of this SI Report. The selection of analytical parameters was generally based upon potential environmental impacts associated with mining era operations in the vicinity of the sampling location or field observations.

The shallow subsurface soil analytical results for Area B contained several COCs at concentrations at or above applicable regulatory criteria. Additionally, historic soil analytical results for surface and subsurface samples indicated the presence of COCs at concentrations above applicable regulatory criteria.

A detailed summary of soil analytical results collected from Area B is provided in **Table 6-1, Summary of Soil Analytical Results (Area B)**. Soil boring logs are included in **Appendix E, Boring Logs** of this SI Report.

#### 6.1.2.1.3 Groundwater Sampling Results

During the advancement of soil borings in Area B, three (3) temporary groundwater sampling locations were established to characterize groundwater in the area. The temporary sampling points were installed and sampled using the methodologies presented in **Section 3**. The screened intervals in the groundwater sampling locations were established from 3 ft to 7 ft bgs. In addition, GSS sampled five existing monitoring wells (MW-301, MW-302, MW-501, MW-503, and MW-505) between September 6 and 7, 2018 and again on September 23, 2020.

A total of 15 groundwater samples inclusive of two duplicate sample were collected. Temporary groundwater and existing monitoring well sampling locations are depicted on **Figure 6-2, Groundwater Analytical Results (Area B)**. Collected groundwater samples were analyzed for the parameters identified on **Table 3-1, Sampling and Analysis Summary** of this SI Report. The selection of analytical parameters was generally based upon potential environmental impacts associated with mining era operations in the vicinity of the sampling location or field observations. A few COCs,



predominantly SVOCs, were detected in the sample collected from temporary monitoring well QMCP-GW67 at concentrations above applicable regulatory criteria. PCBs were not detected in groundwater at Area B nor were any other COCs detected in groundwater during recent sampling above applicable criteria with the exception of metals, which were not evaluated further as discussed in **Section 4.2.5**.

A detailed summary of groundwater analytical results from Area B is provided in **Table 6-2, Summary of Groundwater Analytical Results (Area B)**. Groundwater analytical results are depicted on **Figure 6-2, Groundwater Analytical Results (Area B)**. Soil boring logs are included in **Appendix E, Boring Logs** of this SI Report.

## **6.2 NATURE AND EXTENT OF CONTAMINATION**

Utilizing the established regulatory criteria presented in **Section 4** for various land use categories and exposure pathways, the laboratory analytical results summarized in the preceding section for Area B were reviewed and compared to EGLE Cleanup Criteria Requirements for Response Activity as applicable for the sampled environmental media.

### **6.2.1 Comprehensive Exposure Assessment**

The comparison was completed to determine which ecological and human exposure pathways, risks, and conditions are relevant in Area B. Although not inclusive of relevant pathways where regulatory criteria were not exceeded, the following exposure pathways were determined to be relevant in Area B:

- Risks posed by hazardous substances in soil that may result in the volatilization of contaminants to indoor air in residential settings.
- Risks posed by hazardous substances in soil and the potential for the substances to leach to groundwater that could be used as a drinking water source in both residential and nonresidential settings.
- Risks posed by hazardous substances in soil and the potential for the substances to leach to groundwater that could vent to surface water.
- Risks posed by hazardous substances in soil and the potential for direct contact with these soils in both residential and nonresidential settings.
- Risks posed by hazardous substances in groundwater and the potential for that groundwater to be used as a drinking water source in both residential and nonresidential settings.
- Risks posed by hazardous substances in groundwater and the potential for that groundwater to vent to surface water.
- Risks posed by hazardous substances in groundwater that may result in the volatilization of contaminants to indoor air in both residential and nonresidential settings.
- Risks posed by hazardous substances in groundwater that may result in free-phase liquids.

As discussed in **Section 4.2.5**, the EGLE drinking water and groundwater/surface water interface pathway criteria exceedances for metals were excluded from the soil and groundwater evaluation. The rationale for this exclusion is twofold:

- The Project investigation and anticipated response actions are being undertaken pursuant to Part 201 of NREPA, being PA 451 of 1994, as amended. The concentrations of metals in excess of the EGLE drinking water and groundwater/surface water pathway criteria are ubiquitous in the study area and are predominantly the result of the presence of stamp sands. Stamp sands are not defined as a hazardous substance nor are subject to regulation under Part 201 unless the property otherwise contains hazardous substances in excess of concentrations that satisfy the cleanup criteria for unrestricted residential use; and,
- The study area is part of OU 2 for which the EPA ROD remedy called for No Action. The EPA's ROD OU 2 includes groundwater, surface water, submerged tailings and sediments in Torch Lake, Portage Lake, the Portage Canal, and other area water bodies. Note that EPA's No Action determination relies on the following to mitigate the effects of stamp sand to the extent practicable:
  - The reduction of stamp sand loading to surface water bodies expected as a result of the remedial action taken at OU 1 and OU 3.
  - Ongoing natural sedimentation and detoxification.
  - Institutional programs and practices controlling potential future exposure to site-affected drinking water which were intended to be administered at the county and state level.
  - The long-term monitoring and the five-year review process monitoring requirements of the remedy selected for OU 1 and OU 3 under the 1992 ROD.

Note that metals criteria for other relevant pathways, and cyanide and organic contaminants for all pathways were included in the evaluation.

Furthermore, as discussed in **Section 4.2.5**, EGLE's MSSSLs were not included in the exposure pathway assessment due to unknown anticipated future land use and conditions. The MSSSLs were considered for screening and delineation purposes only.

#### 6.2.1.1 *Soil Exposure Pathway Assessment*

Soil analytical results from the Area B SI identified COC concentrations in soil that were at or above concentrations that trigger a "Facility" designation as defined in Section 20101(1)(s) of the NREPA. The following tables provide an aggregate summary of the soil sample locations with respect to the total number of samples and how they compare to the applicable EGLE Cleanup Criteria for Response Activity under both Residential and Nonresidential exposure scenarios. The tables are based solely on the total number of samples, inclusive of historical samples, collected from Area B. They list only the number of samples for a specific analytical suite that contained one or more exceedances of a given criterion.

| Soil Analytical Result Summary Table                                 | Cleanup Criteria Requirements for Response Activity – Residential** |                    |                    |                                                                                                                                                                                                          |                                                         |                                                       |                                                          |                                          |                                          |                                      |                         |                                                |
|----------------------------------------------------------------------|---------------------------------------------------------------------|--------------------|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------|------------------------------------------|------------------------------------------|--------------------------------------|-------------------------|------------------------------------------------|
|                                                                      | Analytical Summary                                                  |                    |                    | Groundwater Protection                                                                                                                                                                                   |                                                         | Indoor Air                                            | Ambient Air                                              |                                          |                                          |                                      | Contact                 | Csat                                           |
|                                                                      | Total Number of Samples                                             | Detected Analytes* | Total Exceedances* | Residential Drinking Water Protection Criteria                                                                                                                                                           | Groundwater Surface Water Interface Protection Criteria | Soil Volatilization to Indoor Air Inhalation Criteria | Infinite Source Volatile Soil Inhalation Criteria (VSIC) | Finite VSIC for 5 Meter Source Thickness | Finite VSIC for 2 Meter Source Thickness | Particulate Soil Inhalation Criteria | Direct Contact Criteria | Soil Saturation Concentration Screening Levels |
| Inorganics                                                           | 26                                                                  | 136                | 1                  | NA*                                                                                                                                                                                                      | NA*                                                     | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 1                       | 0                                              |
| Cyanide                                                              | 6                                                                   | 3                  | 2                  | 0                                                                                                                                                                                                        | 2                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| VOCs                                                                 | 30                                                                  | 71                 | 13                 | 4                                                                                                                                                                                                        | 5                                                       | 2                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| SVOCs                                                                | 46                                                                  | 212                | 27                 | 0                                                                                                                                                                                                        | 15                                                      | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 4                       | 0                                              |
| Asbestos                                                             | 0                                                                   | 0                  | 0                  | 0                                                                                                                                                                                                        | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Total PCBs                                                           | 7                                                                   | 0                  | 0                  | 0                                                                                                                                                                                                        | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Pesticides                                                           | 6                                                                   | 11                 | 0                  | 0                                                                                                                                                                                                        | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Chloride                                                             | 3                                                                   | 1                  | 1                  | 0                                                                                                                                                                                                        | 1                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 1                       | 0                                              |
| COCs exceeding applicable regulatory criteria in one or more samples |                                                                     |                    |                    | ARSENIC, CYANIDE, 2-METHYLNAPHTHALENE (SVOC), BENZO(A)PYRENE, DIBENZO(A,H)ANTHRACENE, FLUORANTHENE, FLUORENE, NAPHTHALENE (SVOC), PHENANTHRENE, BENZENE, ETHYLBENZENE, TOLUENE, XYLENE – TOTAL, CHLORIDE |                                                         |                                                       |                                                          |                                          |                                          |                                      |                         |                                                |

NA\* = The EGLE drinking water and groundwater/surface water interface pathway criteria exceedances for metals are excluded from the soil evaluation as explained in Section 4.2.5.

\*Denotes total number of specific instances of an analyte being detected or exceeding criteria, can be multiple within one sample location.

\*\*Denotes total number of samples exceeding criteria, cannot be multiple within one sample location.

Total exceedance column does not include MSSLS or non-applicable criteria (DWPC and GSIPC for metals).

| Soil Analytical Result Summary Table                                 | Cleanup Criteria Requirements for Response Activity – Nonresidential** |                    |                    |                                                                                                                                                                         |                                                         |                                                       |                                                          |                                          |                                          |                                      |                         |                                                |
|----------------------------------------------------------------------|------------------------------------------------------------------------|--------------------|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------|------------------------------------------|------------------------------------------|--------------------------------------|-------------------------|------------------------------------------------|
|                                                                      | Analytical Summary                                                     |                    |                    | Groundwater Protection                                                                                                                                                  |                                                         | Indoor Air                                            | Ambient Air                                              |                                          |                                          |                                      | Contact                 | Csat                                           |
|                                                                      | Total Number of Samples                                                | Detected Analytes* | Total Exceedances* | Nonresidential Drinking Water Protection Criteria                                                                                                                       | Groundwater Surface Water Interface Protection Criteria | Soil Volatilization to Indoor Air Inhalation Criteria | Infinite Source Volatile Soil Inhalation Criteria (VSIC) | Finite VSIC for 5 Meter Source Thickness | Finite VSIC for 2 Meter Source Thickness | Particulate Soil Inhalation Criteria | Direct Contact Criteria | Soil Saturation Concentration Screening Levels |
| Inorganics                                                           | 26                                                                     | 136                | 0                  | NA*                                                                                                                                                                     | NA*                                                     | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Cyanide                                                              | 6                                                                      | 3                  | 2                  | 0                                                                                                                                                                       | 2                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| VOCs                                                                 | 30                                                                     | 71                 | 13                 | 4                                                                                                                                                                       | 5                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| SVOCs                                                                | 46                                                                     | 212                | 23                 | 0                                                                                                                                                                       | 15                                                      | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 1                       | 0                                              |
| Asbestos                                                             | 0                                                                      | 0                  | 0                  | 0                                                                                                                                                                       | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Total PCBs                                                           | 7                                                                      | 0                  | 0                  | 0                                                                                                                                                                       | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Pesticides                                                           | 6                                                                      | 11                 | 0                  | 0                                                                                                                                                                       | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Chloride                                                             | 3                                                                      | 1                  | 1                  | 0                                                                                                                                                                       | 1                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 1                       | 0                                              |
| COCs exceeding applicable regulatory criteria in one or more samples |                                                                        |                    |                    | CYANIDE, 2-METHYLNAPHTHALENE (SVOC), BENZO(A)PYRENE, FLUORANTHENE, FLUORENE, NAPHTHALENE (SVOC), PHENANTHRENE, BENZENE, ETHYLBENZENE, TOLUENE, XYLENE – TOTAL, CHLORIDE |                                                         |                                                       |                                                          |                                          |                                          |                                      |                         |                                                |

NA\* = The EGLE drinking water and groundwater/surface water interface pathway criteria exceedances for metals are excluded from the soil evaluation as explained in Section 4.2.5.

\*Denotes total number of specific instances of an analyte being detected or exceeding criteria, can be multiple within one sample location.

\*\*Denotes total number of samples exceeding criteria, cannot be multiple within one sample location.

Total exceedance column does not include MSSLS or non-applicable criteria (DWPC and GSIPC for metals).

#### 6.2.1.2 Groundwater Exposure Pathway Assessment

Groundwater analytical results from Area B identified COC concentrations in groundwater that were at or above concentrations that trigger a “Facility” designation as defined in Section 20101(1)(s) of the NREPA. Similar to the preceding soil tables, the following table provides a summary of the aforementioned groundwater sample locations with respect to the total number of samples and how they compare to the applicable EGLE Cleanup Criteria for Response Activity under both Residential and Nonresidential exposure scenarios.

| Groundwater Analytical Result Summary Table                          | Analytical Summary      |                                    |                    | Cleanup Criteria Requirements for Response Activity – Residential and Nonresidential**                                                                                                                                                                                 |                                        |                                              |                                                                          |                                                                             |                  |                                               |
|----------------------------------------------------------------------|-------------------------|------------------------------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|----------------------------------------------|--------------------------------------------------------------------------|-----------------------------------------------------------------------------|------------------|-----------------------------------------------|
|                                                                      | Total Number of Samples | Total Number of Detected Analytes* | Total Exceedances* | Residential Drinking Water Criteria                                                                                                                                                                                                                                    | Nonresidential Drinking Water Criteria | Groundwater Surface Water Interface Criteria | Residential Groundwater Volatilization to Indoor Air Inhalation Criteria | Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria | Water Solubility | Flammability and Explosivity Screening Levels |
| Inorganics                                                           | 49                      | 73                                 | 0                  | NA*                                                                                                                                                                                                                                                                    | NA*                                    | NA*                                          | 0                                                                        | 0                                                                           | 0                | 0                                             |
| Cyanide                                                              | 0                       | 0                                  | 0                  | 0                                                                                                                                                                                                                                                                      | 0                                      | 0                                            | 0                                                                        | 0                                                                           | 0                | 0                                             |
| VOCs                                                                 | 56                      | 59                                 | 26                 | 10                                                                                                                                                                                                                                                                     | 10                                     | 10                                           | 0                                                                        | 0                                                                           | 0                | 0                                             |
| SVOCs                                                                | 53                      | 78                                 | 51                 | 6                                                                                                                                                                                                                                                                      | 6                                      | 14                                           | 3                                                                        | 3                                                                           | 6                | 0                                             |
| Total PCBs                                                           | 1                       | 0                                  | 0                  | 0                                                                                                                                                                                                                                                                      | 0                                      | 0                                            | 0                                                                        | 0                                                                           | 0                | 0                                             |
| Pesticides                                                           | 0                       | 0                                  | 0                  | 0                                                                                                                                                                                                                                                                      | 0                                      | 0                                            | 0                                                                        | 0                                                                           | 0                | 0                                             |
| Chloride                                                             | 25                      | 23                                 | 14                 | 0                                                                                                                                                                                                                                                                      | 0                                      | 14                                           | 0                                                                        | 0                                                                           | 0                | 0                                             |
| COCs exceeding applicable regulatory criteria in one or more samples |                         |                                    |                    | ANTHRACENE, BENZO(A)ANTHRACENE, BENZO(A)PYRENE, BENZO(B)FLUORANTHENE, BENZO(G,H,I)PERYLENE, BENZO(K)FLUORANTHENE, CHRYSENE, FLUORANTHENE, FLUORENE, INDENO(1,2,3-CD)PYRENE, NAPHTHALENE (SVOC), PHENANTHRENE, BENZENE, ETHYLBENZENE, TOLUENE, XYLENE – TOTAL, CHLORIDE |                                        |                                              |                                                                          |                                                                             |                  |                                               |

NA\* = The EGLE drinking water and groundwater/surface water interface pathway criteria exceedances for metals are excluded from the groundwater evaluation as explained in Section 4.2.5.

\*Denotes total number of specific instances of an analyte being detected or exceeding criteria, can be multiple within one sample location.

\*\*Denotes total number of samples exceeding criteria, cannot be multiple within one sample location.

Total exceedance column does not include MSSLS or non-applicable criteria (DWC and GSIC for metals).

## 6.2.2 Extent of Contamination

The comparison of analytical results to applicable regulatory criteria indicates that potential human health and ecological risks are present in soil and groundwater in Area B. Recalling the goals and objectives of the SI, the following subsections describe the extent of contamination in environmental media in the study area.

### 6.2.2.1 Soil Extent of Contamination

Historic soil analytical results exceeded GSIPC, DWPC, DCC, residential VIAC, and/or soil MSSLS in residential and nonresidential exposure scenarios at multiple sample locations. The predominant contaminants were SVOCs, VOCs, and some inorganic compounds, including cyanide and chloride. Recent SI investigative samples collected from the MDNR trail property detected SVOCs and/or VOCs above GSIPC and/or soil MSSLS for residential and nonresidential exposure scenarios.

Most historic samples were collected from surface and subsurface soil intervals from areas that are generally inaccessible to the public inside the current perimeter fence at the Houghton County Road Commission. Recent SI samples were collected from intervals in areas that are routinely accessible to the general public along the MDNR trail property. The sampling locations were generally within approximately 200 ft of the shoreline of Portage Canal.

Soils with elevated levels of inorganic COCs are ubiquitous in the area, which becomes a limiting factor when evaluating potential exposure pathways. In the case of Area B, elevated concentrations of inorganic and organic contaminants potentially include exposure risks related to inhalation pathways and direct contact in residential and nonresidential scenarios, which must be a consideration when evaluating land use, property accessibility, and the extent of contamination in surface and near surface soils that could be encountered through normal use of the property.

The remaining exposure risks are generally related to the leaching of contaminants to groundwater and their potential impacts on drinking water (if used as a drinking water source) and surface water. These risks pose a long-term threat to the overall environmental health of the watershed. The widespread distribution of inorganic COCs throughout the region limits determinations related to the extent of contamination in Area B. Nevertheless, risks posed to groundwater and surface water are relevant and are a factor when evaluating the extent of soil contamination in the QMCP.

#### 6.2.2.2 *Groundwater Extent of Contamination*

Groundwater analytical results exceeded DWC for both residential and nonresidential exposure scenarios, and GSIC for organic contaminants throughout the western portion of Area B. SVOCs exceeded groundwater VIAC at SB-101 and MW-101 for both residential and nonresidential exposure scenarios, and MSSLs for residential and/or nonresidential scenarios at multiple locations. Water solubility criteria was exceeded at four historic locations (SB-101, MW-101, MW-108, and MW-109) and one recent location (GW-67), indicating the potential for LNAPL which has not been identified or defined. Analytical results from one SI sample location, located on MDNR trail property, exceeded GSIC, DWC for both residential and nonresidential scenarios, and water solubility criteria. The remaining SI groundwater sample locations along the trail did not exceed criteria, suggesting that the groundwater impact historically detected further inland in Area B is not migrating to the Portage Canal except potentially in the vicinity of GW-67. However, MW-502 which is presumably downgradient from MW-101 along the MDNR trail property, was filled with sediment and was not able to be sampled as part of the SI activities.

Groundwater sample intervals and monitoring well depths for historic locations were generally not available for review during evaluation; however, near-shore sample locations are assumed to generally have a shallow water table. SI groundwater sample locations were collected from temporary wells at depths ranging from 3 to 7 ft bgs.

The potential risks associated with groundwater as a drinking water source as well as its connectivity to nearby surface water bodies should be a consideration in determinations related to the extent of contamination in Area B.

### 6.3 **CONCLUSIONS AND RECOMMENDATIONS**

The analytical results and interpretation summarized in the preceding subsections document potential human health and ecological risks that are present in Area B. The following subsections provide a synopsis of these findings and a recommended path forward for addressing these risks in Area B.

#### 6.3.1 **Conclusions**

Environmental impacts in Area B are generally characterized by detections of organic and inorganic contaminants in soil and groundwater. Although specific sources of these contaminants may not be fully understood, historical research related to the operations provided substantive evidence for assessing specific operational areas and selecting target analytes anticipated to be present within the study area.

The analytical results summarized above provide sufficient analytical data and lines of evidence to conclude that the study area is a “Facility” as defined in Section 20101(1)(s) of the NREPA. The following table provides a summary of the affected environmental media, applicable regulatory criteria, and potential receptors within Area B.

| Area B – Media, Criteria, Potential Receptor Summary                 |                           |                                     |                |                                                                                                                                                                                                                                                                                                                                              |                                     |                              |                |                        |            |               |              |                                                        |                              |               |              |
|----------------------------------------------------------------------|---------------------------|-------------------------------------|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|------------------------------|----------------|------------------------|------------|---------------|--------------|--------------------------------------------------------|------------------------------|---------------|--------------|
| Media                                                                | Soil                      |                                     |                | Groundwater                                                                                                                                                                                                                                                                                                                                  |                                     |                              | Air            |                        | Sediment   | Surface Water |              | Building Materials, Asbestos, and Abandoned Containers |                              |               |              |
| Criteria                                                             | Drinking Water Protection | Groundwater Surface Water Interface | Direct Contact | Drinking Water Protection                                                                                                                                                                                                                                                                                                                    | Groundwater Surface Water Interface | Flammability and Explosivity | Volatilization | Particulate Inhalation | Ecological | Ecological    | Human Health | Particulate Inhalation                                 | Flammability and Explosivity | Environmental | Human Health |
| Potential Receptor                                                   |                           |                                     |                |                                                                                                                                                                                                                                                                                                                                              |                                     |                              |                |                        |            |               |              |                                                        |                              |               |              |
| Residential Human                                                    | ✓                         | ✓                                   | ✓              | ✓                                                                                                                                                                                                                                                                                                                                            | ✓                                   |                              | ✓              |                        |            |               |              |                                                        |                              |               |              |
| Nonresidential Human                                                 | ✓                         | ✓                                   | ✓              | ✓                                                                                                                                                                                                                                                                                                                                            | ✓                                   |                              | ✓              |                        |            |               |              |                                                        |                              |               |              |
| Water Column Organism                                                |                           |                                     |                |                                                                                                                                                                                                                                                                                                                                              |                                     |                              |                |                        |            |               |              |                                                        |                              |               |              |
| Benthic Organism                                                     |                           |                                     |                |                                                                                                                                                                                                                                                                                                                                              |                                     |                              |                |                        |            |               |              |                                                        |                              |               |              |
| COCs exceeding applicable regulatory criteria in one or more samples |                           |                                     |                | ARSENIC, CYANIDE, 2-METHYLNAPHTHALENE (SVOC), ANTHRACENE, BENZO(A)ANTHRACENE, BENZO(A)PYRENE, BENZO(B)FLUORANTHENE, BENZO(G,H,I)PERYLENE, BENZO(K)FLUORANTHENE, CHRYSENE, DIBENZO(A,H)ANTHRACENE, FLUORANTHENE, FLUORENE, INDENO(1,2,3-CD)PYRENE, NAPHTHALENE (SVOC), PHENANTHRENE, BENZENE, ETHYLBENZENE, TOLUENE, XYLENE – TOTAL, CHLORIDE |                                     |                              |                |                        |            |               |              |                                                        |                              |               |              |

In addition to the evaluation of analytical results from Area B, the following provides a summary of findings derived from the assessment of Area B with respect to the goals and objectives for the Project:

- Terrestrial sources of contamination are present in the form of inorganic COCs, cyanide, VOCs, SVOCs, and chloride in the study area. Due the historic nature of most of the analytical data, the extent of contamination in Area B has not been fully defined or addressed.
- The source of the observed oil stained soil adjacent to the MDNR trail property has not been identified.
- Soil impacts on the MDNR trail property exceeded GSIPC and soil MSSLS for residential and nonresidential scenarios but did not exceed PSIC or DCC.
- Water solubility criteria was exceeded at four historic locations (SB-101, MW-101, MW-108, and MW-109) and one recent location (GW-67), indicating the potential for LNAPL which has not been identified or defined.

### 6.3.2 Recommendations

The conclusions outlined in the preceding subsection establish that Area B is a Part 201 Facility. Section 20107a of Part 201 of NREPA describes the duties of owners or operators of a Facility, regardless of their liability, including: prevent unacceptable exposures, prevent exacerbation, and take reasonable precautions against the foreseeable actions of third parties. Some exceptions may apply; in any case, owners and operators of contaminated properties should become familiar with Section 20107a and the associated Rules.

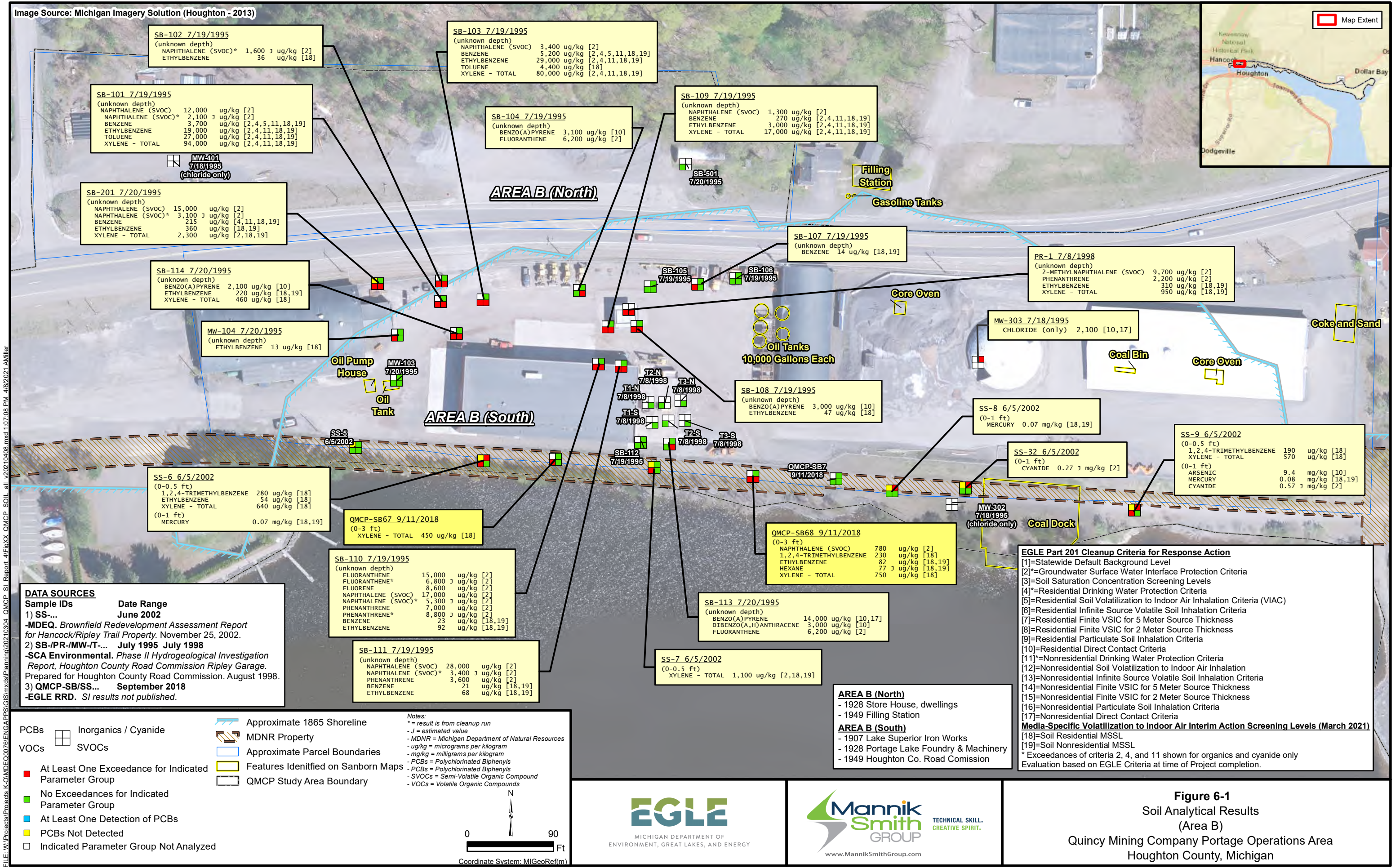


## FIGURES

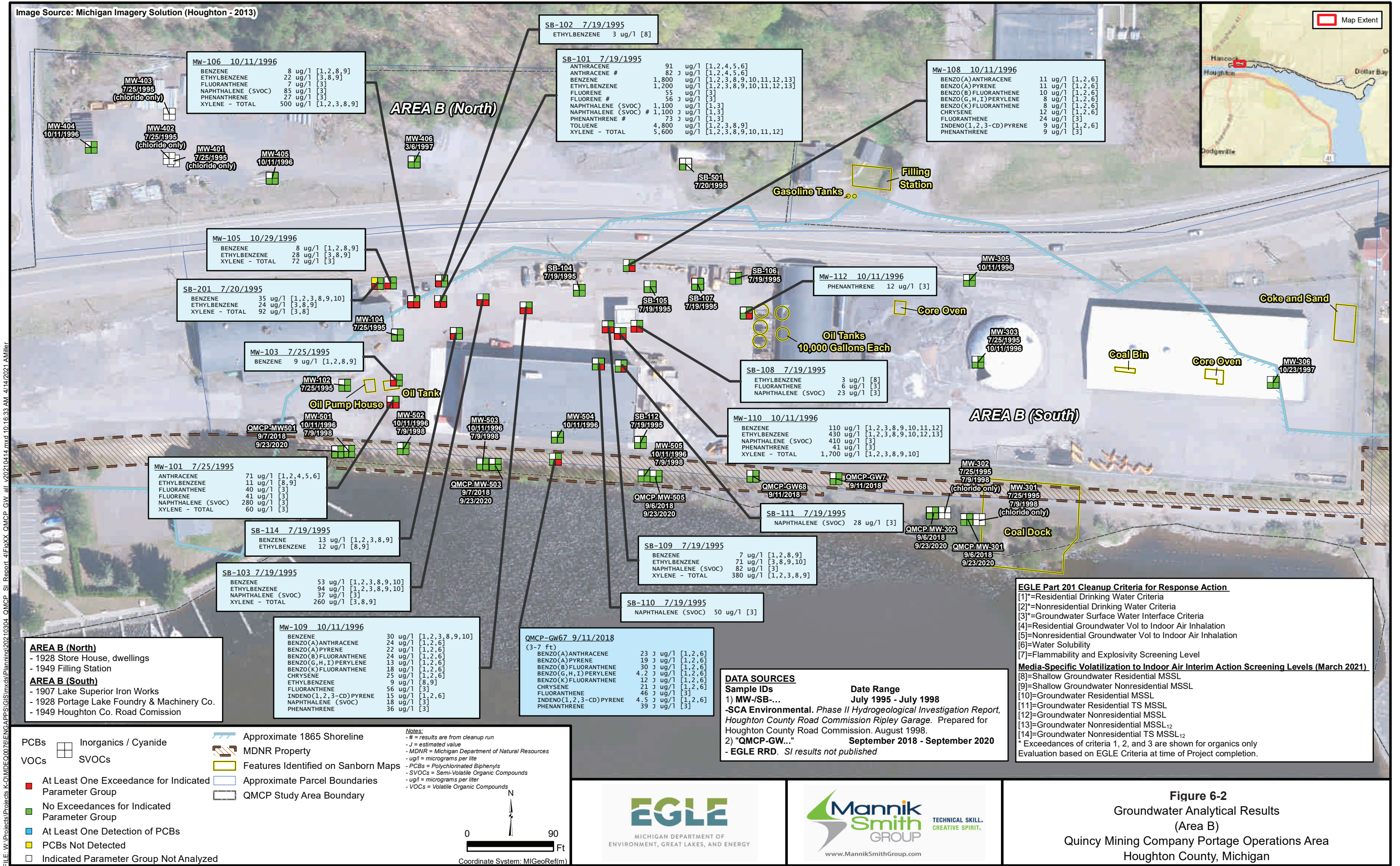
### DETAILED FINDINGS REPORT – AREA B













## TABLES

### DETAILED FINDINGS REPORT – AREA B



TABLE 6-1  
Summary of Soil Analytical Results  
Area B  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code                |            | EGLE Part 201 Generic Cleanup Criteria                                     |                                                                |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                     | Area B      |         |                     |         |             |         |                     |         |             |         |             |         |             |         |             |         |                     |         |
|------------------------------|------------|----------------------------------------------------------------------------|----------------------------------------------------------------|---------------------------------------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------------------|----------------------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------------------------------|-------------------------------------|-------------|---------|---------------------|---------|-------------|---------|---------------------|---------|-------------|---------|-------------|---------|-------------|---------|-------------|---------|---------------------|---------|
| Station Name                 | CAS Number | [2]<br>Groundwater<br>Surface Water<br>Interface<br>Protection<br>Criteria | [4]<br>Residential<br>Drinking Water<br>Protection<br>Criteria | [5]<br>Residential<br>Soil<br>Volatilization<br>to Indoor Air<br>Inhalation<br>Criteria<br>(VSIC) | [9]<br>Residential<br>Particulate<br>Soil Inhalation<br>Criteria | [10]<br>Residential<br>Direct<br>Contact<br>Criteria | [11]<br>Nonresidential<br>Drinking Water<br>Protection<br>Criteria | [16]<br>Nonresidential<br>Particulate<br>Soil Inhalation<br>Criteria | [17]<br>Nonresidential<br>Direct Contact<br>Criteria | [18]<br>Soil Residential<br>MSSL                                            | [19]<br>Soil Nonresidential<br>MSSL | MW-103      |         |                     |         | MW-104      |         |                     |         | MW-302      |         | MW-303      |         | MW-401      |         | SB-101      |         |                     |         |
| Field Sample ID              |            |                                                                            |                                                                |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                                                             |                                     | 5413 MW-103 |         | 5414 MW-103 Cleanup |         | 5413 MW-104 |         | 5413 MW-104 Cleanup |         | 5379 MW-302 |         | 5378 MW-303 |         | 5376 MW-401 |         | 5394 SB-101 |         | 5394 SB-101 Cleanup |         |
| Sample Date                  |            |                                                                            |                                                                |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                                                             |                                     | 7/20/1995   |         | 7/20/1995           |         | 7/20/1995   |         | 7/20/1995           |         | 7/18/1995   |         | 7/18/1995   |         | 7/18/1995   |         | 7/19/1995   |         | 7/19/1995           |         |
| Sample Interval (bgs)        |            |                                                                            |                                                                |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                                                             |                                     | --          |         | --                  |         | --          |         | --                  |         | --          |         | --          |         | --          |         | --          |         | --                  |         |
| Sample Description           |            |                                                                            |                                                                |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                                                             |                                     | --          |         | --                  |         | --          |         | --                  |         | --          |         | --          |         | --          |         | --          |         | --                  |         |
|                              |            |                                                                            |                                                                |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                                                             |                                     | Result      | Exceeds | Result              | Exceeds | Result      | Exceeds | Result              | Exceeds | Result      | Exceeds | Result      | Exceeds | Result      | Exceeds | Result      | Exceeds | Result              | Exceeds |
| Inorganics - Metals (mg/kg)  |            |                                                                            |                                                                |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                                                             |                                     |             |         |                     |         |             |         |                     |         |             |         |             |         |             |         |             |         |                     |         |
| ALUMINIUM                    | 7429-90-5  | NA                                                                         | 6900 (B)                                                       | NLV                                                                                               | ID                                                               | 50,000 (D,BB)                                        | 6,900 (B)                                                          | ID                                                                   | 3.7E+5 (D,BB)                                        | NA                                                                          | NA                                  | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      |
| ANTIMONY                     | 7440-36-0  | 1.2 (X)                                                                    | 4.3                                                            | NLV                                                                                               | 13,000                                                           | 180                                                  | 4.3                                                                | 5,900                                                                | 670                                                  | NA                                                                          | NA                                  | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      |
| ARSENIC                      | 7440-38-2  | 4.6                                                                        | 4.6                                                            | NLV                                                                                               | 720                                                              | 7.6                                                  | 4.6                                                                | 910                                                                  | 37                                                   | NA                                                                          | NA                                  | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      |
| BARIUM                       | 7440-39-3  | 130 (B,G)                                                                  | 1,300 (B)                                                      | NLV                                                                                               | 3.3E+5 (B)                                                       | 37,000 (B)                                           | 1,300 (B)                                                          | 1.5E+5 (B)                                                           | 1.3E+5 (B)                                           | NA                                                                          | NA                                  | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      |
| BERYLLIUM                    | 7440-41-7  | 24 (G)                                                                     | 51                                                             | NLV                                                                                               | 1,300                                                            | 410                                                  | 51                                                                 | 590                                                                  | 1,600                                                | NA                                                                          | NA                                  | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      |
| CADMIUM                      | 7440-43-9  | 1.6 (B,G,X)                                                                | 6.0 (B)                                                        | NLV                                                                                               | 1,700 (B)                                                        | 550 (B)                                              | 6.0 (B)                                                            | 2,200 (B)                                                            | 2,100 (B)                                            | NA                                                                          | NA                                  | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      |
| CALCIUM                      | 7440-70-2  | NA                                                                         | NA                                                             | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                                                                          | NA                                  | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      |
| CHROMIUM                     | 7440-47-3  | 1.2E+6 (B,G,H,X)                                                           | 1.0E+6 (B,D,H)                                                 | NLV                                                                                               | 3.30E+8 (B,H)                                                    | 7.90E+5 (B,H)                                        | 1.00E+6 (B,D,H)                                                    | 1.50E+5 (B,H)                                                        | 1.00E+6 (B,D,H)                                      | NA                                                                          | NA                                  | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      |
| COBALT                       | 7440-48-4  | 2                                                                          | 0.8                                                            | NLV                                                                                               | 13,000                                                           | 2,600                                                | 2                                                                  | 5,900                                                                | 9,000                                                | NA                                                                          | NA                                  | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      |
| COPPER                       | 7440-50-8  | 32 (B,G)                                                                   | 5,800 (B)                                                      | NLV                                                                                               | 130,000 (B)                                                      | 20,000 (B)                                           | 5,800 (B)                                                          | 59,000 (B)                                                           | 73,000 (B)                                           | NA                                                                          | NA                                  | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      |
| IRON                         | 7439-89-6  | --                                                                         | 12,000 (B)                                                     | NLV                                                                                               | ID                                                               | 160,000 (B)                                          | 12,000 (B)                                                         | ID                                                                   | 580,000 (B)                                          | NA                                                                          | NA                                  | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      |
| LEAD                         | 7439-92-1  | 2,500 (B,G,X)                                                              | 700 (B)                                                        | NLV                                                                                               | 100,000 (B)                                                      | 400 (B)                                              | 700 (B)                                                            | 44,000 (B)                                                           | 900 (B,DD)                                           | NA                                                                          | NA                                  | 72          | --      | NM                  | --      | 38          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --      | 0.016       | --      | NM                  | --      |
| LITHIUM                      | 7439-93-2  | 9.8 (B)                                                                    | 9.8 (B)                                                        | NLV                                                                                               | 2.30E+9 (B)                                                      | 4,200 (B,DD)                                         | 9.8 (B)                                                            | 1.00E+6 (B)                                                          | 31,000 (B,DD)                                        | NA                                                                          | NA                                  | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      |
| MAGNESIUM                    | 7439-95-4  | --                                                                         | 8,000 (B)                                                      | NLV                                                                                               | 6.70E+6 (B)                                                      | 1.0E+9 (B,D)                                         | 22,000 (B)                                                         | 2.90E+6 (B)                                                          | 1.00E+6 (B,D)                                        | NA                                                                          | NA                                  | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      |
| MANGANESE                    | 7439-96-5  | 440 (B,G,X)                                                                | 440 (B)                                                        | NLV                                                                                               | 3,300 (B)                                                        | 25,000 (B)                                           | 440 (B)                                                            | 1,500 (B)                                                            | 90,000 (B)                                           | NA                                                                          | NA                                  | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      |
| MERCURY                      | 7439-97-6  | 0.13 (B,Z)                                                                 | 1.7 (B,Z)                                                      | 48 (B,Z)                                                                                          | 20,000 (B,Z)                                                     | 160 (B,Z)                                            | 1.7 (B,Z)                                                          | 8,800 (B,Z)                                                          | 580 (B,Z)                                            | 0.022 (M)                                                                   | 0.066                               | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      |
| NICKEL                       | 7440-02-0  | 29 (G)                                                                     | 100 (B)                                                        | NLV                                                                                               | 13,000 (B)                                                       | 40,000 (B)                                           | 100 (B)                                                            | 16,000 (B)                                                           | 1.50E+5 (B)                                          | NA                                                                          | NA                                  | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      |
| POTASSIUM                    | 7440-09-7  | NA                                                                         | NA                                                             | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                                                                          | NA                                  | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      |
| SELENIUM                     | 7782-49-2  | 0.41 (B)                                                                   | 4.0 (B)                                                        | NLV                                                                                               | 130,000 (B)                                                      | 2,600 (B)                                            | 4.0 (B)                                                            | 59,000 (B)                                                           | 9,600 (B)                                            | NA                                                                          | NA                                  | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      |
| SILVER                       | 7440-22-4  | 1.0 (B,M)                                                                  | 4.5 (B)                                                        | NLV                                                                                               | 6700 (B)                                                         | 2500 (B)                                             | 13 (B)                                                             | 2,900 (B)                                                            | 9,000 (B)                                            | NA                                                                          | NA                                  | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      |
| SODIUM                       | 7440-23-5  | NA                                                                         | 4,600                                                          | NLV                                                                                               | ID                                                               | 1.0E+6 (D)                                           | NA                                                                 | ID                                                                   | 1.0E+6 (D)                                           | NA                                                                          | NA                                  | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      |
| VANADIUM                     | 7440-62-2  | 430                                                                        | 72                                                             | NLV                                                                                               | ID                                                               | 750 (DD)                                             | 990                                                                | ID                                                                   | 5,500 (DD)                                           | NA                                                                          | NA                                  | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      |
| ZINC                         | 7440-66-6  | 62 (B,G)                                                                   | 2,400 (B)                                                      | NLV                                                                                               | ID                                                               | 1.70E+5 (B)                                          | 5,000 (B)                                                          | ID                                                                   | 6.30E+5 (B)                                          | NA                                                                          | NA                                  | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      |
| Inorganics - Cyanide (mg/kg) |            |                                                                            |                                                                |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                                                             |                                     |             |         |                     |         |             |         |                     |         |             |         |             |         |             |         |             |         |                     |         |
| CYANIDE                      | 57-12-5    | 0.1 (P,R)                                                                  | 4.0 (P,R)                                                      | NLV                                                                                               | 250 (P,R)                                                        | 12 (P,R)                                             | 4.0 (P,R)                                                          | 250 (P,R)                                                            | 250 (P,R)                                            | NA                                                                          | NA                                  | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      |
| Organics - PCBs (ug/kg)      |            |                                                                            |                                                                |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                                                             |                                     |             |         |                     |         |             |         |                     |         |             |         |             |         |             |         |             |         |                     |         |
| AROCLOR-1260                 | 11096-82-5 | NA                                                                         | NA                                                             | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                                                                          | NA                                  | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      |
| AROCLOR-1262                 | 37324-23-5 | NA                                                                         | NA                                                             | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                                                                          | NA                                  | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      |
| TOTAL PCBs                   | 1336-36-6  | NLL                                                                        | NLL                                                            | 3.00E+6 (J,T)                                                                                     | 5.20E+6 (J,T)                                                    | 1,000 (J,T)                                          | NLL                                                                | 6.50E+6 (J,T)                                                        | 1,000 (J,T)                                          | NA                                                                          | NA                                  | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      |
| Organics - SVOCs (ug/kg)     |            |                                                                            |                                                                |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                                                             |                                     |             |         |                     |         |             |         |                     |         |             |         |             |         |             |         |             |         |                     |         |
| 1,1-BIPHENYL                 | 92-52-4    | NA                                                                         | NA                                                             | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                                                                          | NA                                  | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      |
| 2-METHYLNAPHTHALENE (SVOC)   | 91-57-6S   | 4,200                                                                      | 57,000                                                         | 2.70E+06                                                                                          | 6.70E+08                                                         | 8.10E+06                                             | 1.70E+05                                                           | 2.90E+08                                                             | 2.60E+07                                             | NA                                                                          | NA                                  | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      |
| ACENAPHTHENE                 | 83-32-9    | 8,700                                                                      | 3.00E+05                                                       | 1.90E+08                                                                                          | 1.40E+10                                                         | 4.10E+07                                             | 8.80E+05                                                           | 6.20E+09                                                             | 1.30E+08                                             | NA                                                                          | NA                                  | <380 U      | --      | <330 UJ             | --      | <1300 U     | --      | <330 UJ             | --      | NM          | --      | NM          | --      | NM          | --      | <2900 U     | --      | <330 UJ             | --      |
| ACENAPHTHYLENE               | 208-96-8   | ID                                                                         | 5,900                                                          | 1.60E+06                                                                                          | 2.30E+09                                                         | 1.60E+06                                             | 17,000                                                             | 1.00E+09                                                             | 5.20E+06                                             | NA                                                                          | NA                                  | <380 U      | --      | <330 UJ             | --      | <1300 U     | --      | <330 UJ             | --      | NM          | --      | NM          | --      | NM          | --      | <2900 U     | --      | <330 UJ             | --      |
| ACETOPHENONE                 | 98-86-2    | ID                                                                         | 30,000                                                         | 1.20E+8 (C)                                                                                       | 3.30E+10                                                         | 4.70E+7 (C)                                          | 88,000                                                             | 1.40E+10                                                             | 1.50E+8 (C)                                          | NA                                                                          | NA                                  | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      |
| ANTHRACENE                   | 120-12-7   | ID                                                                         | 41,000                                                         | 1.00E+9 (D)                                                                                       | 6.70E+10                                                         | 2.30E+08                                             | 41,000                                                             | 2.90E+10                                                             | 7.30E+08                                             | NA                                                                          | NA                                  | <380 U      | --      | <330 UJ             | --      | <1300 U     | --      | <330 UJ             | --      | NM          | --      | NM          | --      | NM          | --      | <2900 U     | --      | <330 UJ             | --      |
| BENZALDEHYDE                 | 100-52-7   | NA                                                                         | NA                                                             | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                                                                          | NA                                  | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      |
| BENZO(A)ANTHRACENE           | 56-55-3    | NLL                                                                        | NLL                                                            | NLV                                                                                               | ID                                                               | 20,000 (Q)                                           | NLL                                                                | ID                                                                   | 80,000 (Q)                                           | NA                                                                          | NA                                  | <380 U      | --      | <330 UJ             | --      | <1300 U     | --      | <330 UJ             | --      | NM          | --      | NM          | --      | NM          | --      | <2900 U     | --      | <330 UJ             | --      |
| BENZO(A)PYRENE               | 50-32-8    | NLL                                                                        | NLL                                                            | NLV                                                                                               | 1.50E+8 (Q)                                                      | 2,000 (Q)                                            | NLL                                                                | 1.90E+6 (Q)                                                          | 8,000 (Q)                                            | NA                                                                          | NA                                  | <380 U      | --      | <330 UJ             | --      | <1300 U     | --      | <330 UJ             | --      | NM          | --      | NM          | --      | NM          | --      | <2900 U     | --      | <330 UJ             | --      |
| BENZO(B)FLUORANTHENE         | 205-99-2   | NLL                                                                        | NLL                                                            | ID                                                                                                | ID                                                               | 20,000 (Q)                                           | NLL                                                                | ID                                                                   | 80,000 (Q)                                           | NA                                                                          | NA                                  | <380 U      | --      | <330 UJ             | --      | <1300 U     | --      | 390 J               | --      | NM          | --      | NM          | --      | NM          | --      | <2900 U     | --      | <330 UJ             | --      |
| BENZO(G,H,I)PERYLENE         | 191-24-2   | NLL                                                                        | NLL                                                            | NLV                                                                                               | 8.00E+08                                                         | 2.50E+06                                             | NLL                                                                | 3.50E+08                                                             | 7.00E+06                                             | NA                                                                          | NA                                  | <380 U      | --      | <330 UJ             | --      | <1300 U     | --      | <330 UJ             | --      | NM          | --      | NM          | --      | NM          | --      | <2900 U     | --      | <330 UJ             | --      |
| BENZO(K)FLUORANTHENE         | 207-08-9   | NLL                                                                        | NLL                                                            | NLV                                                                                               | ID                                                               | 2.00E+5 (Q)                                          | NLL                                                                | ID                                                                   | 8.00E+5 (Q)                                          | NA                                                                          | NA                                  | <380 U      | --      | <330 UJ             | --      | <1300 U     | --      | <330 UJ             | --      | NM          | --      | NM          | --      | NM          | --      | <2900 U     | --      | <330 UJ             | --      |
| BIS(2-ETHYLHEXYL)PHTHALATE   | 117-81-7   | NLL                                                                        | NLL                                                            | NLV                                                                                               | 7.00E+08                                                         | 2.80E+06                                             | NLL                                                                | 8.90E+08                                                             | 1.20E+7 (C)                                          | NA                                                                          | NA                                  | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      |
| BUTYL BENZYL PHTHALATE       | 85-68-7    | 13,000 (X)                                                                 | 2.20E+6 (C)                                                    | NLV                                                                                               | 4.70E+10                                                         | 3.60E+10 (C)                                         | 5.00E+6 (C)                                                        | 2.10E+10                                                             | 1.20E+8 (C)                                          | NA                                                                          | NA                                  | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      |
| CHRYSENE                     | 218-01-9   | NLL                                                                        | NLL                                                            | ID                                                                                                | ID                                                               | 2.00E+6 (Q)                                          | NLL                                                                | ID                                                                   | 8.00E+6 (Q)                                          | NA                                                                          | NA                                  | <380 U      | --      | <330 UJ             | --      | <1300 U     | --      | <330 UJ             | --      | NM          | --      | NM          | --      | NM          | --      | <2900 U     | --      | <330 UJ             | --      |

TABLE 6-1  
Summary of Soil Analytical Results  
Area B  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code                      |            | EGLE Part 201 Generic Cleanup Criteria                                     |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                        | Area B      |         |                     |         |             |         |                     |         |             |         |             |           |             |         |             |                  |                     |         |
|------------------------------------|------------|----------------------------------------------------------------------------|-------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------------------|----------------------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------------------------------|----------------------------------------|-------------|---------|---------------------|---------|-------------|---------|---------------------|---------|-------------|---------|-------------|-----------|-------------|---------|-------------|------------------|---------------------|---------|
| Station Name                       | CAS Number | [2]<br>Groundwater<br>Surface Water<br>Interface<br>Protection<br>Criteria | [4]<br>Residential<br>Drinking<br>Water<br>Protection<br>Criteria | [5]<br>Residential<br>Soil<br>Volatilization<br>to Indoor Air<br>Inhalation<br>Criteria<br>(VSIC) | [9]<br>Residential<br>Particulate<br>Soil Inhalation<br>Criteria | [10]<br>Residential<br>Direct<br>Contact<br>Criteria | [11]<br>Nonresidential<br>Drinking Water<br>Protection<br>Criteria | [16]<br>Nonresidential<br>Particulate<br>Soil Inhalation<br>Criteria | [17]<br>Nonresidential<br>Direct Contact<br>Criteria | [18]<br>Soil Residential<br>MSSL                                            | [19]<br>Soil<br>Nonresidential<br>MSSL | MW-103      |         |                     |         | MW-104      |         |                     |         | MW-302      |         | MW-303      |           | MW-401      |         | SB-101      |                  |                     |         |
| Field Sample ID                    |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                                                             |                                        | 5413 MW-103 |         | 5414 MW-103 Cleanup |         | 5413 MW-104 |         | 5413 MW-104 Cleanup |         | 5379 MW-302 |         | 5378 MW-303 |           | 5376 MW-401 |         | 5394 SB-101 |                  | 5394 SB-101 Cleanup |         |
| Sample Date                        |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                                                             |                                        | 7/20/1995   |         | 7/20/1995           |         | 7/20/1995   |         | 7/20/1995           |         | 7/18/1995   |         | 7/18/1995   |           | 7/18/1995   |         | 7/19/1995   |                  | 7/19/1995           |         |
| Sample Interval (bgs)              |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                                                             |                                        | --          |         | --                  |         | --          |         | --                  |         | --          |         | --          |           | --          |         | --          |                  | --                  |         |
| Sample Description                 |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                                                             |                                        | --          |         | --                  |         | --          |         | --                  |         | --          |         | --          |           | --          |         | --          |                  | --                  |         |
|                                    |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                                                             |                                        | Result      | Exceeds | Result              | Exceeds | Result      | Exceeds | Result              | Exceeds | Result      | Exceeds | Result      | Exceeds   | Result      | Exceeds | Result      | Exceeds          | Result              | Exceeds |
| Organics - SVOCs (ug/kg) Continued |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                                                             |                                        |             |         |                     |         |             |         |                     |         |             |         |             |           |             |         |             |                  |                     |         |
| DIBENZO(A,H)ANTHRACENE             | 53-70-3    | NLL                                                                        | NLL                                                               | NLV                                                                                               | ID                                                               | 2,000 (Q)                                            | NLL                                                                | ID                                                                   | 8,000 (Q)                                            | NA                                                                          | NA                                     | <380 U      | --      | <330 UJ             | --      | <1300 U     | --      | <330 UJ             | --      | NM          | --      | NM          | --        | NM          | --      | <2900 U     | --               | <330 UJ             | --      |
| DIBENZOFURAN                       | 132-64-9   | 1,700                                                                      | ID                                                                | 2.00E+06                                                                                          | 6.70E+06                                                         | ID                                                   | ID                                                                 | 2.90E+06                                                             | ID                                                   | NA                                                                          | NA                                     | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --        | NM          | --      | NM          | --               | NM                  | --      |
| FLUORANTHENE                       | 206-44-0   | 5,500                                                                      | 730,000                                                           | 1.00E+9 (D)                                                                                       | 9.30E+09                                                         | 4.60E+07                                             | 730,000                                                            | 4.10E+09                                                             | 1.30E+08                                             | NA                                                                          | NA                                     | <380 U      | --      | <330 UJ             | --      | <1300 U     | --      | <330 UJ             | --      | NM          | --      | NM          | --        | NM          | --      | <2900 U     | --               | <330 UJ             | --      |
| FLUORENE                           | 86-73-7    | 5,300                                                                      | 390,000                                                           | 5.80E+08                                                                                          | 9.30E+09                                                         | 2.70E+07                                             | 890,000                                                            | 4.10E+09                                                             | 8.70E+07                                             | NA                                                                          | NA                                     | <380 U      | --      | <330 UJ             | --      | <1300 U     | --      | <330 UJ             | --      | NM          | --      | NM          | --        | NM          | --      | <2900 U     | --               | <330 UJ             | --      |
| INDENO(1,2,3-CD)PYRENE             | 193-39-5   | NLL                                                                        | NLL                                                               | NLV                                                                                               | ID                                                               | 20,000 (Q)                                           | NLL                                                                | ID                                                                   | 80,000 (Q)                                           | NA                                                                          | NA                                     | <380 U      | --      | <330 UJ             | --      | <1300 U     | --      | <330 UJ             | --      | NM          | --      | NM          | --        | NM          | --      | <2900 U     | --               | <330 UJ             | --      |
| NAPHTHALENE (SVOC)                 | 91-20-3S   | 730                                                                        | 35,000                                                            | 2.50E+05                                                                                          | 2.00E+08                                                         | 1.60E+07                                             | 1.00E+05                                                           | 8.80E+07                                                             | 5.20E+07                                             | NA                                                                          | NA                                     | <380 U      | --      | <330 UJ             | --      | <1300 U     | --      | <330 UJ             | --      | NM          | --      | NM          | --        | NM          | --      | 12,000      | [2]              | 2,100 J             | [2]     |
| PHENANTHRENE                       | 85-01-8    | 2,100                                                                      | 56,000                                                            | 2.80E+06                                                                                          | 6.70E+06                                                         | 1.60E+06                                             | 1.60E+05                                                           | 2.90E+06                                                             | 5.20E+06                                             | NA                                                                          | NA                                     | <380 U      | --      | <330 UJ             | --      | <1300 U     | --      | <330 UJ             | --      | NM          | --      | NM          | --        | NM          | --      | <2900 U     | --               | <330 UJ             | --      |
| PYRENE                             | 129-00-0   | ID                                                                         | 4.80E+05                                                          | 1.00E+9 (D)                                                                                       | 6.70E+09                                                         | 2.90E+07                                             | 4.80E+05                                                           | 2.90E+09                                                             | 8.40E+07                                             | NA                                                                          | NA                                     | 1,400       | --      | <330 UJ             | --      | 1,500       | --      | <330 UJ             | --      | NM          | --      | NM          | --        | NM          | --      | <2900 U     | --               | <330 UJ             | --      |
| Organics - VOCs (ug/kg)            |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                                                             |                                        |             |         |                     |         |             |         |                     |         |             |         |             |           |             |         |             |                  |                     |         |
| 1,2,3-TRIMETHYLBENZENE             | 526-73-8   | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | 270 (JT)                                                                    | 800 (JT)                               | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --        | NM          | --      | NM          | --               | NM                  | --      |
| 1,2,4-TRIMETHYLBENZENE             | 95-63-6    | 570 (I)                                                                    | 2,100 (I)                                                         | 4.3E+6 (C,I)                                                                                      | 8.20E+10 (I)                                                     | 3.2E+07 (C,I)                                        | 2,100 (I)                                                          | 3.60E+10 (I)                                                         | 1.00E+8 (C,I)                                        | 150 (JT)                                                                    | 430 (JT)                               | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --        | NM          | --      | NM          | --               | NM                  | --      |
| 1,3,5-TRIMETHYLBENZENE             | 108-67-8   | 1,100 (I)                                                                  | 1,800 (I)                                                         | 2.6E+6 (C,I)                                                                                      | 8.20E+10 (I)                                                     | 3.2E+07 (C)                                          | 2,100 (I)                                                          | 3.60E+10 (I)                                                         | 1.00E+8 (C,I)                                        | 100 (JT)                                                                    | 300 (JT)                               | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --        | NM          | --      | NM          | --               | NM                  | --      |
| 2,2,4-TRIMETHYLPENTANE             | 540-84-1   | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                                                                          | NA                                     | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --        | NM          | --      | NM          | --               | NM                  | --      |
| 2-METHYLNAPHTHALENE (VOC)          | 91-57-6V   | 4,200                                                                      | 57,000                                                            | 2.70E+06                                                                                          | 6.70E+08                                                         | 8.10E+06                                             | 1.70E+05                                                           | 2.90E+08                                                             | 2.60E+07                                             | NA                                                                          | NA                                     | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --        | NM          | --      | NM          | --               | NM                  | --      |
| BENZENE                            | 71-43-2    | 240 (I,X)                                                                  | 100 (I)                                                           | 1,600 (I)                                                                                         | 3.80E+8 (I)                                                      | 1.8E+5 (I)                                           | 100 (I)                                                            | 4.70E+8 (I)                                                          | 8.40E+5 (C,I)                                        | 1.7 (M)                                                                     | 7.9 (M)                                | <10 U       | --      | NM                  | --      | <10 U       | --      | NM                  | --      | NM          | --      | NM          | --        | NM          | --      | 3,700       | [2,4,5,11,18,19] | NM                  | --      |
| CYCLOHEXANE                        | 110-82-7   | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                                                                          | NA                                     | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --        | NM          | --      | NM          | --               | NM                  | --      |
| ETHYLBENZENE                       | 100-41-4   | 360                                                                        | 1,500                                                             | 87,000                                                                                            | 1.00E+10                                                         | 2.20E+07                                             | 1,500                                                              | 1.30E+10                                                             | 7.10E+07                                             | 12 (M)                                                                      | 57                                     | <10 U       | --      | NM                  | --      | 13          | [18]    | NM                  | --      | NM          | --      | NM          | --        | NM          | --      | 19,000      | [2,4,11,18,19]   | NM                  | --      |
| HEXANE                             | 110-54-3   | NA                                                                         | 1.8E+5 (C)                                                        | 5.1E+5 (C)                                                                                        | 1.30E+10                                                         | 9.2E+7 (C)                                           | 5.10E+5 (C)                                                        | 5.90E+09                                                             | 3.00E+8 (C)                                          | 25                                                                          | 74                                     | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --        | NM          | --      | NM          | --               | NM                  | --      |
| ISOPROPYLBENZENE                   | 98-82-8    | 3,200                                                                      | 91,000                                                            | 4.00E+5 (C)                                                                                       | 5.80E+09                                                         | 2.50E+7 (C)                                          | 2.60E+05                                                           | 2.60E+09                                                             | 8.00E+7 (C)                                          | NA                                                                          | NA                                     | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --        | NM          | --      | NM          | --               | NM                  | --      |
| M,P-XYLENE                         | 1330-20-7  | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                                                                          | NA                                     | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --        | NM          | --      | NM          | --               | NM                  | --      |
| NAPHTHALENE (VOC)                  | 91-20-3V   | 730                                                                        | 35,000                                                            | 2.50E+05                                                                                          | 2.00E+08                                                         | 1.60E+07                                             | 1.00E+05                                                           | 8.80E+07                                                             | 5.20E+07                                             | NA                                                                          | NA                                     | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --        | NM          | --      | NM          | --               | NM                  | --      |
| N-PROPYLBENZENE                    | 103-65-1   | ID                                                                         | 1,600 (I)                                                         | ID                                                                                                | 1.30E+9 (I)                                                      | 2.50E+6 (I)                                          | 4,600                                                              | 5.90E+08                                                             | 8.00E+06                                             | 1,800                                                                       | 3,500                                  | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --        | NM          | --      | NM          | --               | NM                  | --      |
| O-XYLENE                           | 95-47-6    | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                                                                          | NA                                     | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --        | NM          | --      | NM          | --               | NM                  | --      |
| P-ISOPROPYL TOLUENE (p-CYMENTHENE) | 99-87-6    | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                                                                          | NA                                     | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --        | NM          | --      | NM          | --               | NM                  | --      |
| SEC-BUTYLBENZENE                   | 135-98-8   | ID                                                                         | 1,600                                                             | ID                                                                                                | 4.00E+08                                                         | 2.50E+06                                             | 4,600                                                              | 1.80E+08                                                             | 8.00E+06                                             | NA                                                                          | NA                                     | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --        | NM          | --      | NM          | --               | NM                  | --      |
| STYRENE                            | 100-42-5   | 530 (X)                                                                    | 2,700                                                             | 2.50E+05                                                                                          | 5.50E+09                                                         | 4.00E+05                                             | 2,700                                                              | 6.90E+09                                                             | 1.90E+6 (C)                                          | NA                                                                          | NA                                     | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --        | NM          | --      | NM          | --               | NM                  | --      |
| TETRACHLOROETHYLENE                | 127-18-4   | 220 (X)                                                                    | 100                                                               | 11,000                                                                                            | 2.70E+09                                                         | 2.0E+5 (C)                                           | 100                                                                | 1.20E+09                                                             | 9.30E+5 (C)                                          | 6.2 (M)                                                                     | 12 (M)                                 | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --        | NM          | --      | NM          | --               | NM                  | --      |
| TOLUENE                            | 108-88-3   | 5,400 (I)                                                                  | 16,000 (I)                                                        | 3.30E+5 (C,I)                                                                                     | 2.70E+10 (I)                                                     | 5E+07 (C,I)                                          | 16,000 (I)                                                         | 1.20E+10 (I)                                                         | 1.60E+8 (C,I)                                        | 3,700                                                                       | 11,000                                 | <10 U       | --      | NM                  | --      | <10 U       | --      | NM                  | --      | NM          | --      | NM          | --        | NM          | --      | 27,000      | [2,4,11,18,19]   | NM                  | --      |
| XYLENE - TOTAL                     | 1330-20-7  | 980 (I)                                                                    | 5,600 (I)                                                         | 6.30E+6 (I)                                                                                       | 2.90E+11 (I)                                                     | 4.1E+08 (C,I)                                        | 5,600 (I)                                                          | 1.30E+11 (I)                                                         | 1.00E+9 (C,D,I)                                      | 280 (J)                                                                     | 830 (J)                                | <30 U       | --      | NM                  | --      | <30 U       | --      | NM                  | --      | NM          | --      | NM          | --        | NM          | --      | 94,000      | [2,4,11,18,19]   | NM                  | --      |
| Organics - Pesticides (ug/kg)      |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                                                             |                                        |             |         |                     |         |             |         |                     |         |             |         |             |           |             |         |             |                  |                     |         |
| 4,4-DDE                            | 72-55-9    | NLL                                                                        | NLL                                                               | NLV                                                                                               | 3.20E+07                                                         | 45,000                                               | NLL                                                                | 4.00E+07                                                             | 1.90E+05                                             | NA                                                                          | NA                                     | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --        | NM          | --      | NM          | --               | NM                  | --      |
| 4,4-DDT                            | 50-29-3    | NLL                                                                        | NLL                                                               | NLV                                                                                               | 3.20E+07                                                         | 57,000                                               | NLL                                                                | 4.00E+07                                                             | 2.80E+05                                             | NA                                                                          | NA                                     | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --        | NM          | --      | NM          | --               | NM                  | --      |
| ALDRIN                             | 309-00-2   | NLL                                                                        | NLL                                                               | 1.30E+06                                                                                          | 6.40E+05                                                         | 1,000                                                | NLL                                                                | 8.00E+05                                                             | 4,300                                                | NA                                                                          | NA                                     | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --        | NM          | --      | NM          | --               | NM                  | --      |
| ALPHA-CHLORDANE                    | 5103-71-9  | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                                                                          | NA                                     | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --        | NM          | --      | NM          | --               | NM                  | --      |
| BETA-BHC                           | 319-85-7   | ID                                                                         | 37                                                                | NLV                                                                                               | 5.90E+06                                                         | 5,400                                                | 150                                                                | 7.40E+06                                                             | 25,000                                               | NA                                                                          | NA                                     | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --        | NM          | --      | NM          | --               | NM                  | --      |
| ENDOSULFAN I                       | 959-98-8   | NLL                                                                        | NLL                                                               | ID                                                                                                | ID                                                               | 1.4E+06 (J)                                          | NLL                                                                | ID                                                                   | 4.40E+06 (J)                                         | NA                                                                          | NA                                     | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --        | NM          | --      | NM          | --               | NM                  | --      |
| ENDRIN KETONE                      | 53494-70-5 | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                                                                          | NA                                     | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --        | NM          | --      | NM          | --               | NM                  | --      |
| GAMMA-CHLORDANE                    | 5103-74-2  | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                                                                          | NA                                     | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --        | NM          | --      | NM          | --               | NM                  | --      |
| HEPTACHLOR                         | 76-44-8    | NLL                                                                        | NLL                                                               | 3.50E+05                                                                                          | 2.40E+06                                                         | 5,600                                                | NLL                                                                | 3.00E+06                                                             | 23,000                                               | NA                                                                          | NA                                     | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --        | NM          | --      | NM          | --               | NM                  | --      |
| Other                              |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                                                             |                                        |             |         |                     |         |             |         |                     |         |             |         |             |           |             |         |             |                  |                     |         |
| CHLORIDE (mg/kg)                   | --         | 94 (X)                                                                     | 5,000                                                             | NLV                                                                                               | ID                                                               | 500 (F)                                              | 5,000                                                              | ID                                                                   | 500 (F)                                              | NA                                                                          | NA                                     | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | <20 U       | --      | 2,100       | [2,10,17] | <20 U       | --      | NM          | --               | NM                  | --      |
| PERCENT MOISTURE (%)               | --         | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                                                                          | NA                                     | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --        | NM          | --      | NM          | --               | NM                  | --      |
| HYDROCARBONS, TOTAL (mg/kg)        | --         | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                                                                          | NA                                     | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --        | NM          | --      | NM          | --               | NM                  | --      |

TABLE 6-1  
Summary of Soil Analytical Results  
Area B  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code                |            | EGLE Part 201 Generic Cleanup Criteria                                     |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |             | Area B  |                     |         |             |         |             |         |                     |         |             |         |             |         |                     |         |             |         |                     |         |
|------------------------------|------------|----------------------------------------------------------------------------|-------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------------------|----------------------------------------------------------------------|------------------------------------------------------|----------------------------------|-----------------------------------------------------------------------------|-------------|---------|---------------------|---------|-------------|---------|-------------|---------|---------------------|---------|-------------|---------|-------------|---------|---------------------|---------|-------------|---------|---------------------|---------|
| Station Name                 | CAS Number | [2]<br>Groundwater<br>Surface Water<br>Interface<br>Protection<br>Criteria | [4]<br>Residential<br>Drinking<br>Water<br>Protection<br>Criteria | [5]<br>Residential<br>Soil<br>Volatilization<br>to Indoor Air<br>Inhalation<br>Criteria<br>(VSIC) | [9]<br>Residential<br>Particulate<br>Soil Inhalation<br>Criteria | [10]<br>Residential<br>Direct<br>Contact<br>Criteria | [11]<br>Nonresidential<br>Drinking Water<br>Protection<br>Criteria | [16]<br>Nonresidential<br>Particulate<br>Soil Inhalation<br>Criteria | [17]<br>Nonresidential<br>Direct Contact<br>Criteria | [18]<br>Soil Residential<br>MSSL | [19]<br>Soil<br>Nonresidential<br>MSSL                                      | SB-102      |         |                     |         | SB-103      |         | SB-104      |         |                     |         | SB-105      |         | SB-106      |         |                     |         | SB-107      |         |                     |         |
| Field Sample ID              |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | 5395 SB-102 |         | 5396 SB-102 Cleanup |         | 5396 SB-103 |         | 5397 SB-104 |         | 5397 SB-104 Cleanup |         | 5398 SB-105 |         | 5399 SB-106 |         | 5399 SB-106 Cleanup |         | 5400 SB-107 |         | 5400 SB-107 Cleanup |         |
| Sample Date                  |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | 7/19/1995   |         | 7/19/1995           |         | 7/19/1995   |         | 7/19/1995   |         | 7/19/1995           |         | 7/19/1995   |         | 7/19/1995   |         | 7/19/1995           |         | 7/19/1995   |         | 7/19/1995           |         |
| Sample Interval (bgs)        |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | --          |         | --                  |         | --          |         | --          |         | --                  |         | --          |         | --          |         | --                  |         | --          |         | --                  |         |
| Sample Description           |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | --          |         | --                  |         | --          |         | --          |         | --                  |         | --          |         | --          |         | --                  |         | --          |         | --                  |         |
|                              |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | Result      | Exceeds | Result              | Exceeds | Result      | Exceeds | Result      | Exceeds | Result              | Exceeds | Result      | Exceeds | Result      | Exceeds | Result              | Exceeds | Result      | Exceeds | Result              | Exceeds |
| Inorganics - Metals (mg/kg)  |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |             |         |                     |         |             |         |             |         |                     |         |             |         |             |         |                     |         |             |         |                     |         |
| ALUMINUM                     | 7429-90-5  | NA                                                                         | 6900 (B)                                                          | NLV                                                                                               | ID                                                               | 50,000 (D,BB)                                        | 6,900 (B)                                                          | ID                                                                   | 3.7E+5 (D,BB)                                        | NA                               | NA                                                                          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      |
| ANTIMONY                     | 7440-36-0  | 1.2 (X)                                                                    | 4.3                                                               | NLV                                                                                               | 13,000                                                           | 180                                                  | 4.3                                                                | 5,900                                                                | 670                                                  | NA                               | NA                                                                          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      |
| ARSENIC                      | 7440-38-2  | 4.6                                                                        | 4.6                                                               | NLV                                                                                               | 720                                                              | 7.6                                                  | 4.6                                                                | 910                                                                  | 37                                                   | NA                               | NA                                                                          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      |
| BARIUM                       | 7440-39-3  | 130 (B,G)                                                                  | 1,300 (B)                                                         | NLV                                                                                               | 3.3E+5 (B)                                                       | 37,000 (B)                                           | 1,300 (B)                                                          | 1.5E+5 (B)                                                           | 1.3E+5 (B)                                           | NA                               | NA                                                                          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      |
| BERYLLIUM                    | 7440-41-7  | 24 (G)                                                                     | 51                                                                | NLV                                                                                               | 1,300                                                            | 410                                                  | 51                                                                 | 590                                                                  | 1,600                                                | NA                               | NA                                                                          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      |
| CADMIUM                      | 7440-43-9  | 1.6 (B,G,X)                                                                | 6.0 (B)                                                           | NLV                                                                                               | 1,700 (B)                                                        | 550 (B)                                              | 6.0 (B)                                                            | 2,200 (B)                                                            | 2,100 (B)                                            | NA                               | NA                                                                          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      |
| CALCIUM                      | 7440-70-2  | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      |
| CHROMIUM                     | 7440-47-3  | 1.2E+6 (B,G,H,X)                                                           | 1.0E+6 (B,D,H)                                                    | NLV                                                                                               | 3.30E+8 (B,H)                                                    | 7.90E+5 (B,H)                                        | 1.00E+6 (B,D,H)                                                    | 1.50E+5 (B,H)                                                        | 1.00E+6 (B,D,H)                                      | NA                               | NA                                                                          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      |
| COBALT                       | 7440-48-4  | 2                                                                          | 0.8                                                               | NLV                                                                                               | 13,000                                                           | 2,600                                                | 2                                                                  | 5,900                                                                | 9,000                                                | NA                               | NA                                                                          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      |
| COPPER                       | 7440-50-8  | 32 (B,G)                                                                   | 5,800 (B)                                                         | NLV                                                                                               | 130,000 (B)                                                      | 20,000 (B)                                           | 5,800 (B)                                                          | 59,000 (B)                                                           | 73,000 (B)                                           | NA                               | NA                                                                          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      |
| IRON                         | 7439-89-6  | --                                                                         | 12,000 (B)                                                        | NLV                                                                                               | ID                                                               | 160,000 (B)                                          | 12,000 (B)                                                         | ID                                                                   | 580,000 (B)                                          | NA                               | NA                                                                          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      |
| LEAD                         | 7439-92-1  | 2,500 (B,G,X)                                                              | 700 (B)                                                           | NLV                                                                                               | 100,000 (B)                                                      | 400 (B)                                              | 700 (B)                                                            | 44,000 (B)                                                           | 900 (B,DD)                                           | NA                               | NA                                                                          | 0.008       | --      | NM                  | --      | 0.008       | --      | 0.084       | --      | NM                  | --      | 0.01        | --      | 0.028       | --      | NM                  | --      | 0.014       | --      | NM                  | --      |
| LITHIUM                      | 7439-93-2  | 9.8 (B)                                                                    | 9.8 (B)                                                           | NLV                                                                                               | 2.30E+9 (B)                                                      | 4,200 (B,DD)                                         | 9.8 (B)                                                            | 1.00E+6 (B)                                                          | 31,000 (B,DD)                                        | NA                               | NA                                                                          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      |
| MAGNESIUM                    | 7439-95-4  | --                                                                         | 8,000 (B)                                                         | NLV                                                                                               | 6.70E+6 (B)                                                      | 1.0E+9 (B,D)                                         | 22,000 (B)                                                         | 2.90E+6 (B)                                                          | 1.00E+6 (B,D)                                        | NA                               | NA                                                                          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      |
| MANGANESE                    | 7439-96-5  | 440 (B,G,X)                                                                | 440 (B)                                                           | NLV                                                                                               | 3,300 (B)                                                        | 25,000 (B)                                           | 440 (B)                                                            | 1,500 (B)                                                            | 90,000 (B)                                           | NA                               | NA                                                                          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      |
| MERCURY                      | 7439-97-6  | 0.13 (B,Z)                                                                 | 1.7 (B,Z)                                                         | 48 (B,Z)                                                                                          | 20,000 (B,Z)                                                     | 160 (B,Z)                                            | 1.7 (B,Z)                                                          | 8,800 (B,Z)                                                          | 580 (B,Z)                                            | 0.022 (M)                        | 0.066                                                                       | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      |
| NICKEL                       | 7440-02-0  | 29 (G)                                                                     | 100 (B)                                                           | NLV                                                                                               | 13,000 (B)                                                       | 40,000 (B)                                           | 100 (B)                                                            | 16,000 (B)                                                           | 1.50E+5 (B)                                          | NA                               | NA                                                                          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      |
| POTASSIUM                    | 7440-09-7  | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      |
| SELENIUM                     | 7782-49-2  | 0.41 (B)                                                                   | 4.0 (B)                                                           | NLV                                                                                               | 130,000 (B)                                                      | 2,600 (B)                                            | 4.0 (B)                                                            | 59,000 (B)                                                           | 9,600 (B)                                            | NA                               | NA                                                                          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      |
| SILVER                       | 7440-22-4  | 1.0 (B,M)                                                                  | 4.5 (B)                                                           | NLV                                                                                               | 6700 (B)                                                         | 2500 (B)                                             | 13 (B)                                                             | 2,900 (B)                                                            | 9,000 (B)                                            | NA                               | NA                                                                          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      |
| SODIUM                       | 7440-23-5  | NA                                                                         | 4,600                                                             | NLV                                                                                               | ID                                                               | 1.0E+6 (D)                                           | NA                                                                 | ID                                                                   | 1.0E+6 (D)                                           | NA                               | NA                                                                          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      |
| VANADIUM                     | 7440-62-2  | 430                                                                        | 72                                                                | NLV                                                                                               | ID                                                               | 750 (DD)                                             | 990                                                                | ID                                                                   | 5,500 (DD)                                           | NA                               | NA                                                                          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      |
| ZINC                         | 7440-66-6  | 62 (B,G)                                                                   | 2,400 (B)                                                         | NLV                                                                                               | ID                                                               | 1.70E+5 (B)                                          | 5,000 (B)                                                          | ID                                                                   | 6.30E+5 (B)                                          | NA                               | NA                                                                          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      |
| Inorganics - Cyanide (mg/kg) |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |             |         |                     |         |             |         |             |         |                     |         |             |         |             |         |                     |         |             |         |                     |         |
| CYANIDE                      | 57-12-5    | 0.1 (P,R)                                                                  | 4.0 (P,R)                                                         | NLV                                                                                               | 250 (P,R)                                                        | 12 (P,R)                                             | 4.0 (P,R)                                                          | 250 (P,R)                                                            | 250 (P,R)                                            | NA                               | NA                                                                          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      |
| Organics - PCBs (ug/kg)      |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |             |         |                     |         |             |         |             |         |                     |         |             |         |             |         |                     |         |             |         |                     |         |
| AROCLOR-1260                 | 11096-82-5 | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      |
| AROCLOR-1262                 | 37324-23-5 | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      |
| TOTAL PCBs                   | 1336-36-6  | NLL                                                                        | NLL                                                               | 3.00E+6 (J,T)                                                                                     | 5.20E+6 (J,T)                                                    | 1,000 (J,T)                                          | NLL                                                                | 6.50E+6 (J,T)                                                        | 1,000 (J,T)                                          | NA                               | NA                                                                          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      |
| Organics - SVOCs (ug/kg)     |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |             |         |                     |         |             |         |             |         |                     |         |             |         |             |         |                     |         |             |         |                     |         |
| 1,1-BIPHENYL                 | 92-52-4    | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      |
| 2-METHYLNAPHTHALENE (SVOC)   | 91-57-6S   | 4,200                                                                      | 57,000                                                            | 2.70E+06                                                                                          | 6.70E+08                                                         | 8.10E+06                                             | 1.70E+05                                                           | 2.90E+08                                                             | 2.60E+07                                             | NA                               | NA                                                                          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      |
| ACENAPHTHENE                 | 83-32-9    | 8,700                                                                      | 3.00E+05                                                          | 1.90E+08                                                                                          | 1.40E+10                                                         | 4.10E+07                                             | 8.80E+05                                                           | 6.20E+09                                                             | 1.30E+08                                             | NA                               | NA                                                                          | <330 U      | --      | <330 UJ             | --      | <2100 U     | --      | <1600 U     | --      | <330 UJ             | --      | <330 U      | --      | <1700 U     | --      | <330 UJ             | --      | <1400 U     | --      | <330 UJ             | --      |
| ACENAPHTHYLENE               | 208-96-8   | ID                                                                         | 5,900                                                             | 1.60E+06                                                                                          | 2.30E+09                                                         | 1.60E+06                                             | 17,000                                                             | 1.00E+09                                                             | 5.20E+06                                             | NA                               | NA                                                                          | <330 U      | --      | <330 UJ             | --      | <2100 U     | --      | <1600 U     | --      | <330 UJ             | --      | <330 U      | --      | <1700 U     | --      | <330 UJ             | --      | <1400 U     | --      | <330 UJ             | --      |
| ACETOPHENONE                 | 98-86-2    | ID                                                                         | 30,000                                                            | 1.20E+8 (C)                                                                                       | 3.30E+10                                                         | 4.70E+7 (C)                                          | 88,000                                                             | 1.40E+10                                                             | 1.50E+8 (C)                                          | NA                               | NA                                                                          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      |
| ANTHRACENE                   | 120-12-7   | ID                                                                         | 41,000                                                            | 1.00E+9 (D)                                                                                       | 6.70E+10                                                         | 2.30E+08                                             | 41,000                                                             | 2.90E+10                                                             | 7.30E+08                                             | NA                               | NA                                                                          | 650         | --      | 740 J               | --      | <2100 U     | --      | 3,400       | --      | 880 J               | --      | <330 U      | --      | 3,100       | --      | 970 J               | --      | <1400 U     | --      | <330 UJ             | --      |
| BENZALDEHYDE                 | 100-52-7   | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      |
| BENZO(A)ANTHRACENE           | 56-55-3    | NLL                                                                        | NLL                                                               | NLV                                                                                               | ID                                                               | 20,000 (Q)                                           | NLL                                                                | ID                                                                   | 80,000 (Q)                                           | NA                               | NA                                                                          | <330 U      | --      | <330 UJ             | --      | <2100 U     | --      | 3,900       | --      | 1,200 J             | --      | <330 U      | --      | <1700 U     | --      | 610 J               | --      | <1400 U     | --      | <330 UJ             | --      |
| BENZO(A)PYRENE               | 50-32-8    | NLL                                                                        | NLL                                                               | NLV                                                                                               | 1.50E+8 (Q)                                                      | 2,000 (Q)                                            | NLL                                                                | 1.90E+6 (Q)                                                          | 8,000 (Q)                                            | NA                               | NA                                                                          | <330 U      | --      | <330 UJ             | --      | <2100 U     | --      | 3,100       | [10]    | 940 J               | --      | <330 U      | --      | <1700 U     | --      | 480 J               | --      | <1400 U     | --      | <330 UJ             | --      |
| BENZO(B)FLUORANTHENE         | 205-99-2   | NLL                                                                        | NLL                                                               | ID                                                                                                | ID                                                               | 20,000                                               | NLL                                                                | ID                                                                   | 80,000 (Q)                                           | NA                               | NA                                                                          | <330 U      | --      | <330 UJ             | --      | 2,600       | --      | 7,000       | --      | 1,100 J             | --      | <330 U      | --      | <1700 U     | --      | 490 J               | --      | <1400 U     | --      | <330 UJ             | --      |
| BENZO(G,H,I)PERYLENE         | 191-24-2   | NLL                                                                        | NLL                                                               | NLV                                                                                               | 8.00E+08                                                         | 2.50E+06                                             | NLL                                                                | 3.50E+08                                                             | 7.00E+06                                             | NA                               | NA                                                                          | <330 U      | --      | <330 UJ             | --      | <2100 U     | --      | <1600 U     | --      | 500 J               | --      | <330 U      | --      | <1700 U     | --      | <330 UJ             | --      | <1400 U     | --      | <330 UJ             | --      |
| BENZO(K)FLUORANTHENE         | 207-08-9   | NLL                                                                        | NLL                                                               | NLV                                                                                               | ID                                                               | 2.00E+5 (Q)                                          | NLL                                                                | ID                                                                   | 8.00E+5 (Q)                                          | NA                               | NA                                                                          | <330 U      | --      | <330 UJ             | --      | 2,400       | --      | <1600 U     | --      | 760 J               | --      | <330 U      | --      | <1700 U     | --      | 430 J               | --      | <1400 U     | --      | <330 UJ             | --      |
| BIS(2-ETHYLHEXYL)PHTHALATE   | 117-81-7   | NLL                                                                        | NLL                                                               | NLV                                                                                               | 7.00E+08                                                         | 2.80E+06                                             | NLL                                                                | 8.90E+08                                                             | 1.20E+7 (C)                                          | NA                               | NA                                                                          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM                  | --      |
| BUTYL BENZYL PHTHALATE       | 85-68-7    | 13,000 (X)                                                                 | 2.20E+6 (C)                                                       | NLV                                                                                               | 4.70E+10                                                         | 3.60E+10                                             |                                                                    |                                                                      |                                                      |                                  |                                                                             |             |         |                     |         |             |         |             |         |                     |         |             |         |             |         |                     |         |             |         |                     |         |

**TABLE 6-1**  
**Summary of Soil Analytical Results**  
**Area B**  
**Quincy Mining Company Portage Operations Area**  
**Abandoned Mining Wastes - Torch Lake Non-Superfund Site**

| Location Code                      |            | EGLE Part 201 Generic Cleanup Criteria                         |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                  | Area B      |                     |             |             |                     |                  |             |                     |             |                     |        |         |         |         |         |         |         |         |         |    |  |  |  |  |  |  |  |  |  |
|------------------------------------|------------|----------------------------------------------------------------|-------------------------------------------------------|---------------------------------------------------------------------------------|---------------------------------------------------------|---------------------------------------------|-----------------------------------------------------------|-------------------------------------------------------------|------------------------------------------------|-----------------------------------------------------------------------------|----------------------------------|-------------|---------------------|-------------|-------------|---------------------|------------------|-------------|---------------------|-------------|---------------------|--------|---------|---------|---------|---------|---------|---------|---------|---------|----|--|--|--|--|--|--|--|--|--|
| Station Name                       | CAS Number | [2]<br>Groundwater Surface Water Interface Protection Criteria | [4]<br>Residential Drinking Water Protection Criteria | [5]<br>Residential Soil Volatilization to Indoor Air Inhalation Criteria (VSIC) | [9]<br>Residential Particulate Soil Inhalation Criteria | [10]<br>Residential Direct Contact Criteria | [11]<br>Nonresidential Drinking Water Protection Criteria | [16]<br>Nonresidential Particulate Soil Inhalation Criteria | [17]<br>Nonresidential Direct Contact Criteria | [18]<br>Soil Residential MSSL                                               | [19]<br>Soil Nonresidential MSSL | SB-102      |                     | SB-103      |             | SB-104              |                  |             |                     | SB-105      |                     | SB-106 |         |         |         | SB-107  |         |         |         |         |    |  |  |  |  |  |  |  |  |  |
| Field Sample ID                    |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                                                                             |                                  | 5395 SB-102 | 5396 SB-102 Cleanup | 5396 SB-103 | 5397 SB-104 | 5397 SB-104 Cleanup | 5398 SB-105      | 5399 SB-106 | 5399 SB-106 Cleanup | 5400 SB-107 | 5400 SB-107 Cleanup |        |         |         |         |         |         |         |         |         |    |  |  |  |  |  |  |  |  |  |
| Sample Date                        |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                                                                             |                                  | 7/19/1995   | 7/19/1995           | 7/19/1995   | 7/19/1995   | 7/19/1995           | 7/19/1995        | 7/19/1995   | 7/19/1995           | 7/19/1995   | 7/19/1995           |        |         |         |         |         |         |         |         |         |    |  |  |  |  |  |  |  |  |  |
| Sample Interval (bgs)              |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                                                                             |                                  | --          | --                  | --          | --          | --                  | --               | --          | --                  | --          | --                  |        |         |         |         |         |         |         |         |         |    |  |  |  |  |  |  |  |  |  |
| Sample Description                 |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                                                                             |                                  |             |                     |             |             |                     |                  |             |                     |             |                     |        |         |         |         |         |         |         |         |         |    |  |  |  |  |  |  |  |  |  |
|                                    |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                                                                             |                                  |             |                     |             |             |                     |                  |             |                     |             |                     |        |         |         |         |         |         |         |         |         |    |  |  |  |  |  |  |  |  |  |
|                                    |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                                                                             |                                  |             |                     |             |             |                     |                  |             |                     |             |                     |        |         |         |         |         |         |         |         |         |    |  |  |  |  |  |  |  |  |  |
|                                    |            | Result                                                         | Exceeds                                               | Result                                                                          | Exceeds                                                 | Result                                      | Exceeds                                                   | Result                                                      | Exceeds                                        | Result                                                                      | Exceeds                          | Result      | Exceeds             | Result      | Exceeds     | Result              | Exceeds          | Result      | Exceeds             | Result      | Exceeds             | Result | Exceeds | Result  | Exceeds | Result  | Exceeds | Result  | Exceeds |         |    |  |  |  |  |  |  |  |  |  |
| Organics - SVOCs (ug/kg) Continued |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                                                                             |                                  |             |                     |             |             |                     |                  |             |                     |             |                     |        |         |         |         |         |         |         |         |         |    |  |  |  |  |  |  |  |  |  |
| DIBENZO(A,H)ANTHRACENE             | 53-70-3    | NLL                                                            | NLL                                                   | NLV                                                                             | ID                                                      | 2,000 (Q)                                   | NLL                                                       | ID                                                          | 8,000 (Q)                                      | NA                                                                          | NA                               | <330 U      | --                  | <330 UJ     | --          | <2100 U             | --               | <1600 U     | --                  | <330 UJ     | --                  | <330 U | --      | <1700 U | --      | <330 UJ | --      | <1400 U | --      | <330 UJ | -- |  |  |  |  |  |  |  |  |  |
| DIBENZOFURAN                       | 132-64-9   | 1,700                                                          | ID                                                    | 2.00E+06                                                                        | 6.70E+06                                                | ID                                          | ID                                                        | 2.90E+06                                                    | ID                                             | NA                                                                          | NA                               | NM          | --                  | NM          | --          | NM                  | --               | NM          | --                  | NM          | --                  | NM     | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |  |  |  |  |  |  |  |  |  |
| FLUORANTHENE                       | 206-44-0   | 5,500                                                          | 730,000                                               | 1.00E+9 (D)                                                                     | 9.30E+09                                                | 4.60E+07                                    | 730,000                                                   | 4.10E+09                                                    | 1.30E+08                                       | NA                                                                          | NA                               | 610         | --                  | <330 UJ     | --          | <2100 U             | --               | 6,200       | [2]                 | 1,900 J     | --                  | <330 U | --      | 3,100   | --      | 920 J   | --      | <1400 U | --      | <330 UJ | -- |  |  |  |  |  |  |  |  |  |
| FLUORENE                           | 86-73-7    | 5,300                                                          | 390,000                                               | 5.80E+08                                                                        | 9.30E+09                                                | 2.70E+07                                    | 890,000                                                   | 4.10E+09                                                    | 8.70E+07                                       | NA                                                                          | NA                               | <330 U      | --                  | 360 J       | --          | <2100 U             | --               | <1600 U     | --                  | <330 UJ     | --                  | <330 U | --      | <1700 U | --      | <330 UJ | --      | <1400 U | --      | <330 UJ | -- |  |  |  |  |  |  |  |  |  |
| INDENO(1,2,3-CD)PYRENE             | 193-39-5   | NLL                                                            | NLL                                                   | NLV                                                                             | ID                                                      | 20,000 (Q)                                  | NLL                                                       | ID                                                          | 80,000 (Q)                                     | NA                                                                          | NA                               | <330 U      | --                  | <330 UJ     | --          | <2100 U             | --               | <1600 U     | --                  | 500 J       | --                  | <330 U | --      | <1700 U | --      | <330 UJ | --      | <1400 U | --      | <330 UJ | -- |  |  |  |  |  |  |  |  |  |
| NAPHTHALENE (SVOC)                 | 91-20-3S   | 730                                                            | 35,000                                                | 2.50E+05                                                                        | 2.00E+08                                                | 1.60E+07                                    | 1.00E+05                                                  | 8.80E+07                                                    | 5.20E+07                                       | NA                                                                          | NA                               | <330 U      | --                  | 1,600 J     | [2]         | 3,400               | [2]              | <1600 U     | --                  | <330 UJ     | --                  | <330 U | --      | <1700 U | --      | <330 UJ | --      | <1400 U | --      | <330 UJ | -- |  |  |  |  |  |  |  |  |  |
| PHENANTHRENE                       | 85-01-8    | 2,100                                                          | 56,000                                                | 2.80E+06                                                                        | 6.70E+06                                                | 1.60E+06                                    | 1.60E+05                                                  | 2.90E+06                                                    | 5.20E+06                                       | NA                                                                          | NA                               | <330 U      | --                  | 660 J       | --          | <2100 U             | --               | <1600 U     | --                  | <330 UJ     | --                  | <330 U | --      | <1700 U | --      | 860 J   | --      | <1400 U | --      | <330 UJ | -- |  |  |  |  |  |  |  |  |  |
| PYRENE                             | 129-00-0   | ID                                                             | 4.80E+05                                              | 1.00E+9 (D)                                                                     | 6.70E+09                                                | 2.90E+07                                    | 4.80E+05                                                  | 2.90E+09                                                    | 8.40E+07                                       | NA                                                                          | NA                               | 560         | --                  | <330 UJ     | --          | 5,200               | --               | 9,700       | --                  | 1,800 J     | --                  | 1,000  | --      | 2,700   | --      | 880 J   | --      | <1400 U | --      | <330 UJ | -- |  |  |  |  |  |  |  |  |  |
| Organics - VOCs (ug/kg)            |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                                                                             |                                  |             |                     |             |             |                     |                  |             |                     |             |                     |        |         |         |         |         |         |         |         |         |    |  |  |  |  |  |  |  |  |  |
| 1,2,3-TRIMETHYLBENZENE             | 526-73-8   | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | 270 (JT)                                                                    | 800 (JT)                         | NM          | --                  | NM          | --          | NM                  | --               | NM          | --                  | NM          | --                  | NM     | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |  |  |  |  |  |  |  |  |  |
| 1,2,4-TRIMETHYLBENZENE             | 95-63-6    | 570 (I)                                                        | 2,100 (I)                                             | 4.3E+6 (C,I)                                                                    | 8.20E+10 (I)                                            | 3.2E+07 (C,I)                               | 2,100 (I)                                                 | 3.60E+10 (I)                                                | 1.00E+8 (C,I)                                  | 150 (JT)                                                                    | 430 (JT)                         | NM          | --                  | NM          | --          | NM                  | --               | NM          | --                  | NM          | --                  | NM     | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |  |  |  |  |  |  |  |  |  |
| 1,3,5-TRIMETHYLBENZENE             | 108-67-8   | 1,100 (I)                                                      | 1,800 (I)                                             | 2.6E+6 (C,I)                                                                    | 8.20E+10 (I)                                            | 3.2E+07 (C,I)                               | 2,100 (I)                                                 | 3.60E+10 (I)                                                | 1.00E+8 (C,I)                                  | 100 (JT)                                                                    | 300 (JT)                         | NM          | --                  | NM          | --          | NM                  | --               | NM          | --                  | NM          | --                  | NM     | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |  |  |  |  |  |  |  |  |  |
| 2,2,4-TRIMETHYLPENTANE             | 540-84-1   | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                                                                          | NA                               | NM          | --                  | NM          | --          | NM                  | --               | NM          | --                  | NM          | --                  | NM     | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |  |  |  |  |  |  |  |  |  |
| 2-METHYLNAPHTHALENE (VOC)          | 91-57-6V   | 4,200                                                          | 57,000                                                | 2.70E+06                                                                        | 6.70E+08                                                | 8.10E+06                                    | 1.70E+05                                                  | 2.90E+08                                                    | 2.60E+07                                       | NA                                                                          | NA                               | NM          | --                  | NM          | --          | NM                  | --               | NM          | --                  | NM          | --                  | NM     | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |  |  |  |  |  |  |  |  |  |
| BENZENE                            | 71-43-2    | 240 (I,X)                                                      | 100 (I)                                               | 1,600 (I)                                                                       | 3.80E+8 (I)                                             | 1.8E+5 (I)                                  | 100 (I)                                                   | 4.70E+8 (I)                                                 | 8.40E+5 (C,I)                                  | 1.7 (M)                                                                     | 7.9 (M)                          | <10 U       | --                  | NM          | --          | 5,200               | [2,4,5,11,18,19] | <10 U       | --                  | NM          | --                  | <10 U  | --      | <10 U   | --      | NM      | --      | 14      | [18,19] | NM      | -- |  |  |  |  |  |  |  |  |  |
| CYCLOHEXANE                        | 110-82-7   | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                                                                          | NA                               | NM          | --                  | NM          | --          | NM                  | --               | NM          | --                  | NM          | --                  | NM     | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |  |  |  |  |  |  |  |  |  |
| ETHYLBENZENE                       | 100-41-4   | 360                                                            | 1,500                                                 | 87,000                                                                          | 1.00E+10                                                | 2.20E+07                                    | 1,500                                                     | 1.30E+10                                                    | 7.10E+07                                       | 12 (M)                                                                      | 57                               | 36          | [18]                | NM          | --          | 29,000              | [2,4,11,18,19]   | <10 U       | --                  | NM          | --                  | <10 U  | --      | <10 U   | --      | NM      | --      | <10 U   | --      | NM      | -- |  |  |  |  |  |  |  |  |  |
| HEXANE                             | 110-54-3   | NA                                                             | 1.8E+5 (C)                                            | 5.1E+5 (C)                                                                      | 1.30E+10                                                | 9.2E+7 (C)                                  | 5.10E+5 (C)                                               | 5.90E+09                                                    | 3.00E+8 (C)                                    | 25                                                                          | 74                               | NM          | --                  | NM          | --          | NM                  | --               | NM          | --                  | NM          | --                  | NM     | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |  |  |  |  |  |  |  |  |  |
| ISOPROPYLBENZENE                   | 98-82-8    | 3,200                                                          | 91,000                                                | 4.00E+5 (C)                                                                     | 5.80E+09                                                | 2.50E+7 (C)                                 | 2.60E+05                                                  | 2.60E+09                                                    | 8.00E+7 (C)                                    | NA                                                                          | NA                               | NM          | --                  | NM          | --          | NM                  | --               | NM          | --                  | NM          | --                  | NM     | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |  |  |  |  |  |  |  |  |  |
| M,P-XYLENE                         | 1330-20-7  | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                                                                          | NA                               | NM          | --                  | NM          | --          | NM                  | --               | NM          | --                  | NM          | --                  | NM     | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |  |  |  |  |  |  |  |  |  |
| NAPHTHALENE (VOC)                  | 91-20-3V   | 730                                                            | 35,000                                                | 2.50E+05                                                                        | 2.00E+08                                                | 1.60E+07                                    | 1.00E+05                                                  | 8.80E+07                                                    | 5.20E+07                                       | NA                                                                          | NA                               | NM          | --                  | NM          | --          | NM                  | --               | NM          | --                  | NM          | --                  | NM     | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |  |  |  |  |  |  |  |  |  |
| N-PROPYLBENZENE                    | 103-65-1   | ID                                                             | 1,600 (I)                                             | ID                                                                              | 1.30E+9 (I)                                             | 2.50E+6 (I)                                 | 4,600                                                     | 5.90E+08                                                    | 8.00E+06                                       | 1,800                                                                       | 3,500                            | NM          | --                  | NM          | --          | NM                  | --               | NM          | --                  | NM          | --                  | NM     | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |  |  |  |  |  |  |  |  |  |
| O-XYLENE                           | 95-47-6    | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                                                                          | NA                               | NM          | --                  | NM          | --          | NM                  | --               | NM          | --                  | NM          | --                  | NM     | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |  |  |  |  |  |  |  |  |  |
| P-ISOPROPYL TOLUENE (p-CYMENTHENE) | 99-87-6    | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                                                                          | NA                               | NM          | --                  | NM          | --          | NM                  | --               | NM          | --                  | NM          | --                  | NM     | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |  |  |  |  |  |  |  |  |  |
| SEC-BUTYLBENZENE                   | 135-98-8   | ID                                                             | 1,600                                                 | ID                                                                              | 4.00E+08                                                | 2.50E+06                                    | 4,600                                                     | 1.80E+08                                                    | 8.00E+06                                       | NA                                                                          | NA                               | NM          | --                  | NM          | --          | NM                  | --               | NM          | --                  | NM          | --                  | NM     | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |  |  |  |  |  |  |  |  |  |
| STYRENE                            | 100-42-5   | 530 (X)                                                        | 2,700                                                 | 2.50E+05                                                                        | 5.50E+09                                                | 4.00E+05                                    | 2,700                                                     | 6.90E+09                                                    | 1.90E+6 (C)                                    | NA                                                                          | NA                               | NM          | --                  | NM          | --          | NM                  | --               | NM          | --                  | NM          | --                  | NM     | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |  |  |  |  |  |  |  |  |  |
| TETRACHLOROETHYLENE                | 127-18-4   | 220 (X)                                                        | 100                                                   | 11,000                                                                          | 2.70E+09                                                | 2.0E+5 (C)                                  | 100                                                       | 1.20E+09                                                    | 9.30E+5 (C)                                    | 6.2 (M)                                                                     | 12 (M)                           | NM          | --                  | NM          | --          | NM                  | --               | NM          | --                  | NM          | --                  | NM     | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |  |  |  |  |  |  |  |  |  |
| TOLUENE                            | 108-88-3   | 5,400 (I)                                                      | 16,000 (I)                                            | 3.30E+5 (C,I)                                                                   | 2.70E+10 (I)                                            | 5E+07 (C,I)                                 | 16,000 (I)                                                | 1.20E+10 (I)                                                | 1.60E+8 (C,I)                                  | 3,700                                                                       | 11,000                           | 31          | --                  | NM          | --          | 4,400               | [18]             | <10 U       | --                  | NM          | --                  | <10 U  | --      | <10 U   | --      | NM      | --      | <10 U   | --      | NM      | -- |  |  |  |  |  |  |  |  |  |
| XYLENE - TOTAL                     | 1330-20-7  | 980 (I)                                                        | 5,600 (I)                                             | 6.30E+6 (I)                                                                     | 2.90E+11 (I)                                            | 4.1E+08 (C,I)                               | 5,600 (I)                                                 | 1.30E+11 (I)                                                | 1.00E+9 (C,D,I)                                | 280 (J)                                                                     | 830 (J)                          | 150         | --                  | NM          | --          | 80,000              | [2,4,11,18,19]   | <30 U       | --                  | NM          | --                  | <30 U  | --      | <30 U   | --      | NM      | --      | <30 U   | --      | NM      | -- |  |  |  |  |  |  |  |  |  |
| Organics - Pesticides (ug/kg)      |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                                                                             |                                  |             |                     |             |             |                     |                  |             |                     |             |                     |        |         |         |         |         |         |         |         |         |    |  |  |  |  |  |  |  |  |  |
| 4,4-DDE                            | 72-55-9    | NLL                                                            | NLL                                                   | NLV                                                                             | 3.20E+07                                                | 45,000                                      | NLL                                                       | 4.00E+07                                                    | 1.90E+05                                       | NA                                                                          | NA                               | NM          | --                  | NM          | --          | NM                  | --               | NM          | --                  | NM          | --                  | NM     | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |  |  |  |  |  |  |  |  |  |
| 4,4-DDT                            | 50-29-3    | NLL                                                            | NLL                                                   | NLV                                                                             | 3.20E+07                                                | 57,000                                      | NLL                                                       | 4.00E+07                                                    | 2.80E+05                                       | NA                                                                          | NA                               | NM          | --                  | NM          | --          | NM                  | --               | NM          | --                  | NM          | --                  | NM     | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |  |  |  |  |  |  |  |  |  |
| ALDRIN                             | 309-00-2   | NLL                                                            | NLL                                                   | 1.30E+06                                                                        | 6.40E+05                                                | 1,000                                       | NLL                                                       | 8.00E+05                                                    | 4,300                                          | NA                                                                          | NA                               | NM          | --                  | NM          | --          | NM                  | --               | NM          | --                  | NM          | --                  | NM     | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |  |  |  |  |  |  |  |  |  |
| ALPHA-CHLORDANE                    | 5103-71-9  | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                                                                          | NA                               | NM          | --                  | NM          | --          | NM                  | --               | NM          | --                  | NM          | --                  | NM     | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |  |  |  |  |  |  |  |  |  |
| BETA-BHC                           | 319-85-7   | ID                                                             | 37                                                    | NLV                                                                             | 5.90E+06                                                | 5,400                                       | 150                                                       | 7.40E+06                                                    | 25,000                                         | NA                                                                          | NA                               | NM          | --                  | NM          | --          | NM                  | --               | NM          | --                  | NM          | --                  | NM     | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |  |  |  |  |  |  |  |  |  |
| ENDOSULFAN I                       | 959-98-8   | NLL                                                            | NLL                                                   | ID                                                                              | ID                                                      | 1.4E+06 (J)                                 | NLL                                                       | ID                                                          | 4.40E+06 (J)                                   | NA                                                                          | NA                               | NM          | --                  | NM          | --          | NM                  | --               | NM          | --                  | NM          | --                  | NM     | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |  |  |  |  |  |  |  |  |  |
| ENDRIN KETONE                      | 53494-70-5 | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                                                                          | NA                               | NM          | --                  | NM          | --          | NM                  | --               | NM          | --                  | NM          | --                  | NM     | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |  |  |  |  |  |  |  |  |  |
| GAMMA-CHLORDANE                    | 5103-74-2  | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                                                                          | NA                               | NM          | --                  | NM          | --          | NM                  | --               | NM          | --                  | NM          | --                  | NM     | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |  |  |  |  |  |  |  |  |  |
| HEPTACHLOR                         | 76-44-8    | NLL                                                            | NLL                                                   | 3.50E+05                                                                        | 2.40E+06                                                | 5,600                                       | NLL                                                       | 3.00E+06                                                    | 23,000                                         | NA                                                                          | NA                               | NM          | --                  | NM          | --          | NM                  | --               | NM          | --                  | NM          | --                  | NM     | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |  |  |  |  |  |  |  |  |  |
| Other                              |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                                                                             |                                  |             |                     |             |             |                     |                  |             |                     |             |                     |        |         |         |         |         |         |         |         |         |    |  |  |  |  |  |  |  |  |  |
| CHLORIDE (mg/kg)                   | --         | 94 (X)                                                         | 5,000                                                 | NLV                                                                             | ID                                                      | 500 (F)                                     | 5,000                                                     | ID                                                          | 500 (F)                                        | NA                                                                          | NA                               | NM          | --                  | NM          | --          | NM                  | --               | NM          | --                  | NM          | --                  | NM     | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |  |  |  |  |  |  |  |  |  |
| PERCENT MOISTURE (%)               | --         | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                                                                          | NA                               | NM          | --                  | NM          | --          | NM                  | --               | NM          | --                  | NM          | --                  | NM     | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |  |  |  |  |  |  |  |  |  |
| HYDROCARBONS, TOTAL (mg/kg)        | --         | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                                                                          | NA                               | NM          | --                  | NM          | --          | NM                  | --               | NM          | --                  | NM          | --                  | NM     | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |  |  |  |  |  |  |  |  |  |

Note: Analytical and Criteria Footnotes are included on the last page of the table.



TABLE 6-1  
Summary of Soil Analytical Results  
Area B  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code                |            | EGLE Part 201 Generic Cleanup Criteria                                     |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |             | Area B              |             |                     |             |                     |             |                     |             |                     |          |         |         |         |         |         |        |         |         |         |
|------------------------------|------------|----------------------------------------------------------------------------|-------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------------------|----------------------------------------------------------------------|------------------------------------------------------|----------------------------------|-----------------------------------------------------------------------------|-------------|---------------------|-------------|---------------------|-------------|---------------------|-------------|---------------------|-------------|---------------------|----------|---------|---------|---------|---------|---------|--------|---------|---------|---------|
| Station Name                 | CAS Number | [2]<br>Groundwater<br>Surface Water<br>Interface<br>Protection<br>Criteria | [4]<br>Residential<br>Drinking<br>Water<br>Protection<br>Criteria | [5]<br>Residential<br>Soil<br>Volatilization<br>to Indoor Air<br>Inhalation<br>Criteria<br>(VSIC) | [9]<br>Residential<br>Particulate<br>Soil Inhalation<br>Criteria | [10]<br>Residential<br>Direct<br>Contact<br>Criteria | [11]<br>Nonresidential<br>Drinking Water<br>Protection<br>Criteria | [16]<br>Nonresidential<br>Particulate<br>Soil Inhalation<br>Criteria | [17]<br>Nonresidential<br>Direct Contact<br>Criteria | [18]<br>Soil Residential<br>MSSL | [19]<br>Soil<br>Nonresidential<br>MSSL                                      | SB-108      |                     |             |                     | SB-109      |                     |             |                     | SB-110      |                     |          |         | SB-111  |         |         |         | SB-112 |         |         |         |
| Field Sample ID              |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | 5401 SB-108 | 5401 SB-108 Cleanup | 5402 SB-109 | 5402 SB-109 Cleanup | 5403 SB-110 | 5403 SB-110 Cleanup | 5404 SB-111 | 5404 SB-111 Cleanup | 5405 SB-112 | 5405 SB-112 Cleanup |          |         |         |         |         |         |        |         |         |         |
| Sample Date                  |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | 7/19/1995   | 7/19/1995           | 7/19/1995   | 7/19/1995           | 7/19/1995   | 7/19/1995           | 7/19/1995   | 7/19/1995           | 7/19/1995   | 7/19/1995           |          |         |         |         |         |         |        |         |         |         |
| Sample Interval (bgs)        |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | --          | --                  | --          | --                  | --          | --                  | --          | --                  | --          | --                  |          |         |         |         |         |         |        |         |         |         |
| Sample Description           |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | --          | --                  | --          | --                  | --          | --                  | --          | --                  | --          | --                  |          |         |         |         |         |         |        |         |         |         |
|                              |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |             |                     |             |                     |             |                     |             |                     |             |                     | Result   | Exceeds | Result  | Exceeds | Result  | Exceeds | Result | Exceeds | Result  | Exceeds |
| Inorganics - Metals (mg/kg)  |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |             |                     |             |                     |             |                     |             |                     |             |                     |          |         |         |         |         |         |        |         |         |         |
| ALUMINIUM                    | 7429-90-5  | NA                                                                         | 6900 (B)                                                          | NLV                                                                                               | ID                                                               | 50,000 (D,BB)                                        | 6,900 (B)                                                          | ID                                                                   | 3.7E+5 (D,BB)                                        | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM       | --      | NM      | --      | NM      | --      | NM     | --      | NM      | --      |
| ANTIMONY                     | 7440-36-0  | 1.2 (X)                                                                    | 4.3                                                               | NLV                                                                                               | 13,000                                                           | 180                                                  | 4.3                                                                | 5,900                                                                | 670                                                  | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM       | --      | NM      | --      | NM      | --      | NM     | --      | NM      | --      |
| ARSENIC                      | 7440-38-2  | 4.6                                                                        | 4.6                                                               | NLV                                                                                               | 720                                                              | 7.6                                                  | 4.6                                                                | 910                                                                  | 37                                                   | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM       | --      | NM      | --      | NM      | --      | NM     | --      | NM      | --      |
| BARIUM                       | 7440-39-3  | 130 (B,G)                                                                  | 1,300 (B)                                                         | NLV                                                                                               | 3.3E+5 (B)                                                       | 37,000 (B)                                           | 1,300 (B)                                                          | 1.5E+5 (B)                                                           | 1.3E+5 (B)                                           | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM       | --      | NM      | --      | NM      | --      | NM     | --      | NM      | --      |
| BERYLLIUM                    | 7440-41-7  | 24 (G)                                                                     | 51                                                                | NLV                                                                                               | 1,300                                                            | 410                                                  | 51                                                                 | 590                                                                  | 1,600                                                | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM       | --      | NM      | --      | NM      | --      | NM     | --      | NM      | --      |
| CADMIUM                      | 7440-43-9  | 1.6 (B,G,X)                                                                | 6.0 (B)                                                           | NLV                                                                                               | 1,700 (B)                                                        | 550 (B)                                              | 6.0 (B)                                                            | 2,200 (B)                                                            | 2,100 (B)                                            | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM       | --      | NM      | --      | NM      | --      | NM     | --      | NM      | --      |
| CALCIUM                      | 7440-70-2  | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM       | --      | NM      | --      | NM      | --      | NM     | --      | NM      | --      |
| CHROMIUM                     | 7440-47-3  | 1.2E+6 (B,G,H,X)                                                           | 1.0E+6 (B,D,H)                                                    | NLV                                                                                               | 3.30E+8 (B,H)                                                    | 7.90E+5 (B,H)                                        | 1.00E+6 (B,D,H)                                                    | 1.50E+5 (B,H)                                                        | 1.00E+6 (B,D,H)                                      | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM       | --      | NM      | --      | NM      | --      | NM     | --      | NM      | --      |
| COBALT                       | 7440-48-4  | 2                                                                          | 0.8                                                               | NLV                                                                                               | 13,000                                                           | 2,600                                                | 2                                                                  | 5,900                                                                | 9,000                                                | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM       | --      | NM      | --      | NM      | --      | NM     | --      | NM      | --      |
| COPPER                       | 7440-50-8  | 32 (B,G)                                                                   | 5,800 (B)                                                         | NLV                                                                                               | 130,000 (B)                                                      | 20,000 (B)                                           | 5,800 (B)                                                          | 59,000 (B)                                                           | 73,000 (B)                                           | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM       | --      | NM      | --      | NM      | --      | NM     | --      | NM      | --      |
| IRON                         | 7439-89-6  | --                                                                         | 12,000 (B)                                                        | NLV                                                                                               | ID                                                               | 160,000 (B)                                          | 12,000 (B)                                                         | ID                                                                   | 580,000 (B)                                          | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM       | --      | NM      | --      | NM      | --      | NM     | --      | NM      | --      |
| LEAD                         | 7439-92-1  | 2,500 (B,G,X)                                                              | 700 (B)                                                           | NLV                                                                                               | 100,000 (B)                                                      | 400 (B)                                              | 700 (B)                                                            | 44,000 (B)                                                           | 900 (B,DD)                                           | NA                               | NA                                                                          | 24          | --                  | NM          | --                  | 11          | --                  | NM          | --                  | 13          | --                  | NM       | --      | 8       | --      | NM      | --      | 8      | --      | NM      | --      |
| LITHIUM                      | 7439-93-2  | 9.8 (B)                                                                    | 9.8 (B)                                                           | NLV                                                                                               | 2.30E+9 (B)                                                      | 4,200 (B,DD)                                         | 9.8 (B)                                                            | 1.00E+6 (B)                                                          | 31,000 (B,DD)                                        | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM       | --      | NM      | --      | NM      | --      | NM     | --      | NM      | --      |
| MAGNESIUM                    | 7439-95-4  | --                                                                         | 8,000 (B)                                                         | NLV                                                                                               | 6.70E+6 (B)                                                      | 1.0E+9 (B,D)                                         | 22,000 (B)                                                         | 2.90E+6 (B)                                                          | 1.00E+6 (B,D)                                        | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM       | --      | NM      | --      | NM      | --      | NM     | --      | NM      | --      |
| MANGANESE                    | 7439-96-5  | 440 (B,G,X)                                                                | 440 (B)                                                           | NLV                                                                                               | 3,300 (B)                                                        | 25,000 (B)                                           | 440 (B)                                                            | 1,500 (B)                                                            | 90,000 (B)                                           | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM       | --      | NM      | --      | NM      | --      | NM     | --      | NM      | --      |
| MERCURY                      | 7439-97-6  | 0.13 (B,Z)                                                                 | 1.7 (B,Z)                                                         | 48 (B,Z)                                                                                          | 20,000 (B,Z)                                                     | 160 (B,Z)                                            | 1.7 (B,Z)                                                          | 8,800 (B,Z)                                                          | 580 (B,Z)                                            | 0.022 (M)                        | 0.066                                                                       | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM       | --      | NM      | --      | NM      | --      | NM     | --      | NM      | --      |
| NICKEL                       | 7440-02-0  | 29 (G)                                                                     | 100 (B)                                                           | NLV                                                                                               | 13,000 (B)                                                       | 40,000 (B)                                           | 100 (B)                                                            | 16,000 (B)                                                           | 1.50E+5 (B)                                          | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM       | --      | NM      | --      | NM      | --      | NM     | --      | NM      | --      |
| POTASSIUM                    | 7440-09-7  | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM       | --      | NM      | --      | NM      | --      | NM     | --      | NM      | --      |
| SELENIUM                     | 7782-49-2  | 0.41 (B)                                                                   | 4.0 (B)                                                           | NLV                                                                                               | 130,000 (B)                                                      | 2,600 (B)                                            | 4.0 (B)                                                            | 59,000 (B)                                                           | 9,600 (B)                                            | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM       | --      | NM      | --      | NM      | --      | NM     | --      | NM      | --      |
| SILVER                       | 7440-22-4  | 1.0 (B,M)                                                                  | 4.5 (B)                                                           | NLV                                                                                               | 6700 (B)                                                         | 2500 (B)                                             | 13 (B)                                                             | 2,900 (B)                                                            | 9,000 (B)                                            | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM       | --      | NM      | --      | NM      | --      | NM     | --      | NM      | --      |
| SODIUM                       | 7440-23-5  | NA                                                                         | 4,600                                                             | NLV                                                                                               | ID                                                               | 1.0E+6 (D)                                           | NA                                                                 | ID                                                                   | 1.0E+6 (D)                                           | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM       | --      | NM      | --      | NM      | --      | NM     | --      | NM      | --      |
| VANADIUM                     | 7440-62-2  | 430                                                                        | 72                                                                | NLV                                                                                               | ID                                                               | 750 (DD)                                             | 990                                                                | ID                                                                   | 5,500 (DD)                                           | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM       | --      | NM      | --      | NM      | --      | NM     | --      | NM      | --      |
| ZINC                         | 7440-66-6  | 62 (B,G)                                                                   | 2,400 (B)                                                         | NLV                                                                                               | ID                                                               | 1.70E+5 (B)                                          | 5,000 (B)                                                          | ID                                                                   | 6.30E+5 (B)                                          | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM       | --      | NM      | --      | NM      | --      | NM     | --      | NM      | --      |
| Inorganics - Cyanide (mg/kg) |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |             |                     |             |                     |             |                     |             |                     |             |                     |          |         |         |         |         |         |        |         |         |         |
| CYANIDE                      | 57-12-5    | 0.1 (P,R)                                                                  | 4.0 (P,R)                                                         | NLV                                                                                               | 250 (P,R)                                                        | 12 (P,R)                                             | 4.0 (P,R)                                                          | 250 (P,R)                                                            | 250 (P,R)                                            | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM       | --      | NM      | --      | NM      | --      | NM     | --      | NM      | --      |
| Organics - PCBs (ug/kg)      |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |             |                     |             |                     |             |                     |             |                     |             |                     |          |         |         |         |         |         |        |         |         |         |
| AROCLOR-1260                 | 11096-82-5 | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM       | --      | NM      | --      | NM      | --      | NM     | --      | NM      | --      |
| AROCLOR-1262                 | 37324-23-5 | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM       | --      | NM      | --      | NM      | --      | NM     | --      | NM      | --      |
| TOTAL PCBs                   | 1336-36-6  | NLL                                                                        | NLL                                                               | 3.00E+6 (J,T)                                                                                     | 5.20E+6 (J,T)                                                    | 1,000 (J,T)                                          | NLL                                                                | 6.50E+6 (J,T)                                                        | 1,000 (J,T)                                          | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM       | --      | NM      | --      | NM      | --      | NM     | --      | NM      | --      |
| Organics - SVOCs (ug/kg)     |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |             |                     |             |                     |             |                     |             |                     |             |                     |          |         |         |         |         |         |        |         |         |         |
| 1,1-BIPHENYL                 | 92-52-4    | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM       | --      | NM      | --      | NM      | --      | NM     | --      | NM      | --      |
| 2-METHYLNAPHTHALENE (SVOC)   | 91-57-6S   | 4,200                                                                      | 57,000                                                            | 2.70E+06                                                                                          | 6.70E+08                                                         | 8.10E+06                                             | 1.70E+05                                                           | 2.90E+08                                                             | 2.60E+07                                             | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM       | --      | NM      | --      | NM      | --      | NM     | --      | NM      | --      |
| ACENAPHTHENE                 | 83-32-9    | 8,700                                                                      | 3.00E+05                                                          | 1.90E+08                                                                                          | 1.40E+10                                                         | 4.10E+07                                             | 8.80E+05                                                           | 6.20E+09                                                             | 1.30E+08                                             | NA                               | NA                                                                          | <560 U      | --                  | <330 UJ     | --                  | <560 U      | --                  | <330 UJ     | --                  | 4,500       | --                  | 1,700 J  | --      | 2,500   | --      | 410 J   | --      | <690 U | --      | <330 UJ | --      |
| ACENAPHTHYLENE               | 208-96-8   | ID                                                                         | 5,900                                                             | 1.60E+06                                                                                          | 2.30E+09                                                         | 1.60E+06                                             | 17,000                                                             | 1.00E+09                                                             | 5.20E+06                                             | NA                               | NA                                                                          | <560 U      | --                  | <330 UJ     | --                  | <560 U      | --                  | <330 UJ     | --                  | <1700 U     | --                  | 480 J    | --      | <1700 U | --      | <330 UJ | --      | <690 U | --      | <330 UJ | --      |
| ACETOPHENONE                 | 98-86-2    | ID                                                                         | 30,000                                                            | 1.20E+8 (C)                                                                                       | 3.30E+10                                                         | 4.70E+7 (C)                                          | 88,000                                                             | 1.40E+10                                                             | 1.50E+8 (C)                                          | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM       | --      | NM      | --      | NM      | --      | NM     | --      | NM      | --      |
| ANTHRACENE                   | 120-12-7   | ID                                                                         | 41,000                                                            | 1.00E+9 (D)                                                                                       | 6.70E+10                                                         | 2.30E+08                                             | 41,000                                                             | 2.90E+10                                                             | 7.30E+08                                             | NA                               | NA                                                                          | 970         | --                  | <330 UJ     | --                  | <560 U      | --                  | 340 J       | --                  | 28,000      | --                  | 11,000 J | --      | 15,000  | --      | 3,000 J | --      | <690 U | --      | <330 UJ | --      |
| BENZALDEHYDE                 | 100-52-7   | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM       | --      | NM      | --      | NM      | --      | NM     | --      | NM      | --      |
| BENZO(A)ANTHRACENE           | 56-55-3    | NLL                                                                        | NLL                                                               | NLV                                                                                               | ID                                                               | 20,000 (Q)                                           | NLL                                                                | ID                                                                   | 80,000 (Q)                                           | NA                               | NA                                                                          | 3,200       | --                  | <330 UJ     | --                  | <560 U      | --                  | <330 UJ     | --                  | 4,100       | --                  | 2,100 J  | --      | <1700 U | --      | 340 J   | --      | 740    | --      | <330 UJ | --      |
| BENZO(A)PYRENE               | 50-32-8    | NLL                                                                        | NLL                                                               | NLV                                                                                               | 1.50E+8 (Q)                                                      | 2,000 (Q)                                            | NLL                                                                | 1.90E+6 (Q)                                                          | 8,000 (Q)                                            | NA                               | NA                                                                          | 3,000       | [10]                | <330 UJ     | --                  | <560 U      | --                  | <330 UJ     | --                  | <1700 U     | --                  | 850 J    | --      | <1700 U | --      | <330 UJ | --      | 730    | --      | <330 UJ | --      |
| BENZO(B)FLUORANTHENE         | 205-99-2   | NLL                                                                        | NLL                                                               | ID                                                                                                | ID                                                               | 20,000 (Q)                                           | NLL                                                                | ID                                                                   | 80,000 (Q)                                           | NA                               | NA                                                                          | 4,200       | --                  | <330 UJ     | --                  | <560 U      | --                  | <330 UJ     | --                  | 1,900       | --                  | 2,000 J  | --      | <1700 U | --      | <330 UJ | --      | 1,300  | --      | <330 UJ | --      |
| BENZO(G,H,I)PERYLENE         | 191-24-2   | NLL                                                                        | NLL                                                               | NLV                                                                                               | 8.00E+08                                                         | 2.50E+06                                             | NLL                                                                | 3.50E+08                                                             | 7.00E+06                                             | NA                               | NA                                                                          | 2,100       | --                  | <330 UJ     | --                  | <560 U      | --                  | <330 UJ     | --                  | <1700 U     | --                  | <330 UJ  | --      | <1700 U | --      | <330 UJ | --      | <690 U | --      | <330 UJ | --      |
| BENZO(K)FLUORANTHENE         | 207-08-9   | NLL                                                                        | NLL                                                               | NLV                                                                                               | ID                                                               | 2.00E+5 (Q)                                          | NLL                                                                | ID                                                                   | 8.00E+5 (Q)                                          | NA                               | NA                                                                          | 5,100       | --                  | <330 UJ     | --                  | <560 U      | --                  | <330 UJ     | --                  | <1700 U     | --                  | 1,800 J  | --      | <1700 U | --      | <330 UJ | --      | 900    | --      | <330 UJ | --      |
| BIS(2-ETHYLHEXYL)PHTHALATE   | 117-81-7   | NLL                                                                        | NLL                                                               | NLV                                                                                               | 7.00E+08                                                         | 2.80E+06                                             | NLL                                                                | 8.90E+08                                                             | 1.20E+7 (C)                                          | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM       | --      | NM      | --      | NM      | --      | NM     | --      | NM      | --      |
| BUTYL BENZYL PHTHALATE       | 85-68-7    | 13,000 (X)                                                                 | 2.20E+6 (C)                                                       | NLV                                                                                               | 4.70E+10                                                         | 3.60E+10 (C)                                         | 5.00E+6 (C)                                                        | 2.10E+10                                                             | 1.20E+8 (C)                                          | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --                  | NM       | --      | NM      | --      | NM      | --      | NM     | --      | NM      | --      |
| CHRYSENE                     | 218-01-9   |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |             |                     |             |                     |             |                     |             |                     |             |                     |          |         |         |         |         |         |        |         |         |         |

**TABLE 6-1**  
**Summary of Soil Analytical Results**  
**Area B**  
**Quincy Mining Company Portage Operations Area**  
**Abandoned Mining Wastes - Torch Lake Non-Superfund Site**

| Location Code                      |            | EGLE Part 201 Generic Cleanup Criteria                                     |                                                                |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |             | Area B              |             |                      |                       |                     |             |                     |             |                     |             |         |         |         |         |         |         |         |         |    |    |
|------------------------------------|------------|----------------------------------------------------------------------------|----------------------------------------------------------------|---------------------------------------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------------------|----------------------------------------------------------------------|------------------------------------------------------|----------------------------------|-----------------------------------------------------------------------------|-------------|---------------------|-------------|----------------------|-----------------------|---------------------|-------------|---------------------|-------------|---------------------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|----|----|
| Station Name                       | CAS Number | [2]<br>Groundwater<br>Surface Water<br>Interface<br>Protection<br>Criteria | [4]<br>Residential<br>Drinking Water<br>Protection<br>Criteria | [5]<br>Residential<br>Soil<br>Volatilization<br>to Indoor Air<br>Inhalation<br>Criteria<br>(VSIC) | [9]<br>Residential<br>Particulate<br>Soil Inhalation<br>Criteria | [10]<br>Residential<br>Direct<br>Contact<br>Criteria | [11]<br>Nonresidential<br>Drinking Water<br>Protection<br>Criteria | [16]<br>Nonresidential<br>Particulate<br>Soil Inhalation<br>Criteria | [17]<br>Nonresidential<br>Direct Contact<br>Criteria | [18]<br>Soil Residential<br>MSSL | [19]<br>Soil<br>Nonresidential<br>MSSL                                      | SB-108      |                     |             |                      | SB-109                |                     |             |                     | SB-110      |                     |             |         | SB-111  |         |         |         | SB-112  |         |         |    |    |
| Field Sample ID                    |            |                                                                            |                                                                |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | 5401 SB-108 | 5401 SB-108 Cleanup | 5402 SB-109 | 5402 SB-109 Cleanup  | 5403 SB-110           | 5403 SB-110 Cleanup | 5404 SB-111 | 5404 SB-111 Cleanup | 5405 SB-112 | 5405 SB-112 Cleanup |             |         |         |         |         |         |         |         |         |    |    |
| Sample Date                        |            |                                                                            |                                                                |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | 7/19/1995   | 7/19/1995           | 7/19/1995   | 7/19/1995            | 7/19/1995             | 7/19/1995           | 7/19/1995   | 7/19/1995           | 7/19/1995   | 7/19/1995           |             |         |         |         |         |         |         |         |         |    |    |
| Sample Interval (bgs)              |            |                                                                            |                                                                |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | --          | --                  | --          | --                   | --                    | --                  | --          | --                  | --          | --                  |             |         |         |         |         |         |         |         |         |    |    |
| Sample Description                 |            |                                                                            |                                                                |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | --          | --                  | --          | --                   | --                    | --                  | --          | --                  | --          | --                  |             |         |         |         |         |         |         |         |         |    |    |
|                                    |            | Result                                                                     | Exceeds                                                        | Result                                                                                            | Exceeds                                                          | Result                                               | Exceeds                                                            | Result                                                               | Exceeds                                              | Result                           | Exceeds                                                                     | Result      | Exceeds             | Result      | Exceeds              | Result                | Exceeds             | Result      | Exceeds             | Result      | Exceeds             | Result      | Exceeds | Result  | Exceeds | Result  | Exceeds | Result  | Exceeds |         |    |    |
| Organics - SVOCs (ug/kg) Continued |            |                                                                            |                                                                |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |             |                     |             |                      |                       |                     |             |                     |             |                     |             |         |         |         |         |         |         |         |         |    |    |
| DIBENZO(A,H)ANTHRACENE             | 53-70-3    | NLL                                                                        | NLL                                                            | NLV                                                                                               | ID                                                               | 2,000 (Q)                                            | NLL                                                                | ID                                                                   | 8,000 (Q)                                            | NA                               | NA                                                                          | 640         | --                  | <330 UJ     | --                   | <560 U                | --                  | <330 UJ     | --                  | <1700 U     | --                  | <330 UJ     | --      | <1700 U | --      | <330 UJ | --      | <690 U  | --      | <330 UJ | -- |    |
| DIBENZOFURAN                       | 132-64-9   | 1,700                                                                      | ID                                                             | 2.00E+06                                                                                          | 6.70E+06                                                         | ID                                                   | ID                                                                 | 2.90E+06                                                             | ID                                                   | NA                               | NA                                                                          | NM          | --                  | NM          | --                   | NM                    | --                  | NM          | --                  | NM          | --                  | NM          | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |    |
| FLUORANTHENE                       | 206-44-0   | 5,500                                                                      | 730,000                                                        | 1.00E+9 (D)                                                                                       | 9.30E+09                                                         | 4.60E+07                                             | 730,000                                                            | 4.10E+09                                                             | 1.30E+08                                             | NA                               | NA                                                                          | 830         | --                  | <330 UJ     | --                   | <560 U                | --                  | <330 UJ     | --                  | 15,000 [2]  | 6,800 J [2]         | 5,300       | --      | 1,400 J | --      | <690 U  | --      | <330 UJ | --      | <330 UJ | -- |    |
| FLUORENE                           | 86-73-7    | 5,300                                                                      | 390,000                                                        | 5.80E+08                                                                                          | 9.30E+09                                                         | 2.70E+07                                             | 890,000                                                            | 4.10E+09                                                             | 8.70E+07                                             | NA                               | NA                                                                          | <560 U      | --                  | <330 UJ     | --                   | <560 U                | --                  | <330 UJ     | --                  | 8,600 [2]   | 3,400 J             | 5,200       | --      | 1,100 J | --      | <690 U  | --      | <330 UJ | --      | <330 UJ | -- |    |
| INDENO(1,2,3-CD)PYRENE             | 193-39-5   | NLL                                                                        | NLL                                                            | NLV                                                                                               | ID                                                               | 20,000 (Q)                                           | NLL                                                                | ID                                                                   | 80,000 (Q)                                           | NA                               | NA                                                                          | 1,600       | --                  | <330 UJ     | --                   | <560 U                | --                  | <330 UJ     | --                  | <1700 U     | --                  | <330 UJ     | --      | <1700 U | --      | <330 UJ | --      | <690 U  | --      | <330 UJ | -- |    |
| NAPHTHALENE (SVOC)                 | 91-20-3S   | 730                                                                        | 35,000                                                         | 2.50E+05                                                                                          | 2.00E+08                                                         | 1.60E+07                                             | 1.00E+05                                                           | 8.80E+07                                                             | 5.20E+07                                             | NA                               | NA                                                                          | <560 U      | --                  | <330 UJ     | --                   | 1,300 [2]             | 560 J               | --          | 17,000 [2]          | 5,300 J [2] | 28,000 [2]          | 3,400 J [2] | <690 U  | --      | <330 UJ | --      | <330 UJ | --      | <330 UJ | --      |    |    |
| PHENANTHRENE                       | 85-01-8    | 2,100                                                                      | 56,000                                                         | 2.80E+06                                                                                          | 6.70E+06                                                         | 1.60E+06                                             | 1.60E+05                                                           | 2.90E+06                                                             | 5.20E+06                                             | NA                               | NA                                                                          | 860         | --                  | <330 UJ     | --                   | <560 U                | --                  | <330 UJ     | --                  | 7,000 [2]   | 8,800 J [2]         | 3,600 [2]   | 660 J   | --      | <690 U  | --      | <330 UJ | --      | <330 UJ | --      |    |    |
| PYRENE                             | 129-00-0   | ID                                                                         | 4.80E+05                                                       | 1.00E+9 (D)                                                                                       | 6.70E+09                                                         | 2.90E+07                                             | 4.80E+05                                                           | 2.90E+09                                                             | 8.40E+07                                             | NA                               | NA                                                                          | 16,000      | --                  | <330 UJ     | --                   | 2,300                 | --                  | <330 UJ     | --                  | 12,000      | --                  | 5,100 J     | --      | 6,100   | --      | 1,100 J | --      | 3,500   | --      | <330 UJ | -- |    |
| Organics - VOCs (ug/kg)            |            |                                                                            |                                                                |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |             |                     |             |                      |                       |                     |             |                     |             |                     |             |         |         |         |         |         |         |         |         |    |    |
| 1,2,3-TRIMETHYLBENZENE             | 526-73-8   | NA                                                                         | NA                                                             | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | 270 (JT)                         | 800 (JT)                                                                    | NM          | --                  | NM          | --                   | NM                    | --                  | NM          | --                  | NM          | --                  | NM          | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |    |
| 1,2,4-TRIMETHYLBENZENE             | 95-63-6    | 570 (I)                                                                    | 2,100 (I)                                                      | 4.3E+6 (C,I)                                                                                      | 8.20E+10 (I)                                                     | 3.2E+07 (C,I)                                        | 2,100 (I)                                                          | 3.60E+10 (I)                                                         | 1.00E+8 (C,I)                                        | 150 (JT)                         | 430 (JT)                                                                    | NM          | --                  | NM          | --                   | NM                    | --                  | NM          | --                  | NM          | --                  | NM          | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |    |
| 1,3,5-TRIMETHYLBENZENE             | 108-67-8   | 1,100 (I)                                                                  | 1,800 (I)                                                      | 2.6E+6 (C,I)                                                                                      | 8.20E+10 (I)                                                     | 3.2E+07 (C)                                          | 2,100 (I)                                                          | 3.60E+10 (I)                                                         | 1.00E+8 (C,I)                                        | 100 (JT)                         | 300 (JT)                                                                    | NM          | --                  | NM          | --                   | NM                    | --                  | NM          | --                  | NM          | --                  | NM          | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |    |
| 2,2,4-TRIMETHYLPENTANE             | 540-84-1   | NA                                                                         | NA                                                             | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM          | --                  | NM          | --                   | NM                    | --                  | NM          | --                  | NM          | --                  | NM          | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |    |
| 2-METHYLNAPHTHALENE (VOC)          | 91-57-6V   | 4,200                                                                      | 57,000                                                         | 2.70E+06                                                                                          | 6.70E+08                                                         | 8.10E+06                                             | 1.70E+05                                                           | 2.90E+08                                                             | 2.60E+07                                             | NA                               | NA                                                                          | NM          | --                  | NM          | --                   | NM                    | --                  | NM          | --                  | NM          | --                  | NM          | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |    |
| BENZENE                            | 71-43-2    | 240 (I,X)                                                                  | 100 (I)                                                        | 1,600 (I)                                                                                         | 3.80E+8 (I)                                                      | 1.8E+5 (I)                                           | 100 (I)                                                            | 4.70E+8 (I)                                                          | 8.40E+5 (C,I)                                        | 1.7 (M)                          | 7.9 (M)                                                                     | <10 U       | --                  | NM          | --                   | 270 [2,4,11,18,19]    | NM                  | --          | 23 [18,19]          | NM          | --                  | 21 [18,19]  | NM      | --      | <10 U   | --      | NM      | --      | NM      | --      |    |    |
| CYCLOHEXANE                        | 110-82-7   | NA                                                                         | NA                                                             | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM          | --                  | NM          | --                   | NM                    | --                  | NM          | --                  | NM          | --                  | NM          | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |    |
| ETHYLBENZENE                       | 100-41-4   | 360                                                                        | 1,500                                                          | 87,000                                                                                            | 1.00E+10                                                         | 2.20E+07                                             | 1,500                                                              | 1.30E+10                                                             | 7.10E+07                                             | 12 (M)                           | 57                                                                          | 47 [18]     | NM                  | --          | 3,000 [2,4,11,18,19] | NM                    | --                  | 92 [18,19]  | NM                  | --          | 68 [18,19]          | NM          | --      | <10 U   | --      | NM      | --      | NM      | --      | NM      | -- |    |
| HEXANE                             | 110-54-3   | NA                                                                         | 1.8E+5 (C)                                                     | 5.1E+5 (C)                                                                                        | 1.30E+10                                                         | 9.2E+7 (C)                                           | 5.10E+5 (C)                                                        | 5.90E+09                                                             | 3.00E+8 (C)                                          | 25                               | 74                                                                          | NM          | --                  | NM          | --                   | NM                    | --                  | NM          | --                  | NM          | --                  | NM          | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |    |
| ISOPROPYLBENZENE                   | 98-82-8    | 3,200                                                                      | 91,000                                                         | 4.00E+5 (C)                                                                                       | 5.80E+09                                                         | 2.50E+7 (C)                                          | 2.60E+05                                                           | 2.60E+09                                                             | 8.00E+7 (C)                                          | NA                               | NA                                                                          | NM          | --                  | NM          | --                   | NM                    | --                  | NM          | --                  | NM          | --                  | NM          | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |    |
| M,P-XYLENE                         | 1330-20-7  | NA                                                                         | NA                                                             | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM          | --                  | NM          | --                   | NM                    | --                  | NM          | --                  | NM          | --                  | NM          | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |    |
| NAPHTHALENE (VOC)                  | 91-20-3V   | 730                                                                        | 35,000                                                         | 2.50E+05                                                                                          | 2.00E+08                                                         | 1.60E+07                                             | 1.00E+05                                                           | 8.80E+07                                                             | 5.20E+07                                             | NA                               | NA                                                                          | NM          | --                  | NM          | --                   | NM                    | --                  | NM          | --                  | NM          | --                  | NM          | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |    |
| N-PROPYLBENZENE                    | 103-65-1   | ID                                                                         | 1,600 (I)                                                      | ID                                                                                                | 1.30E+9 (I)                                                      | 2.50E+6 (I)                                          | 4,600                                                              | 5.90E+08                                                             | 8.00E+06                                             | 1,800                            | 3,500                                                                       | NM          | --                  | NM          | --                   | NM                    | --                  | NM          | --                  | NM          | --                  | NM          | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |    |
| O-XYLENE                           | 95-47-6    | NA                                                                         | NA                                                             | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM          | --                  | NM          | --                   | NM                    | --                  | NM          | --                  | NM          | --                  | NM          | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |    |
| P-ISOPROPYL TOLUENE (p-CYMENTHENE) | 99-87-6    | NA                                                                         | NA                                                             | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM          | --                  | NM          | --                   | NM                    | --                  | NM          | --                  | NM          | --                  | NM          | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |    |
| SEC-BUTYLBENZENE                   | 135-98-8   | ID                                                                         | 1,600                                                          | ID                                                                                                | 4.00E+08                                                         | 2.50E+06                                             | 4,600                                                              | 1.80E+08                                                             | 8.00E+06                                             | NA                               | NA                                                                          | NM          | --                  | NM          | --                   | NM                    | --                  | NM          | --                  | NM          | --                  | NM          | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |    |
| STYRENE                            | 100-42-5   | 530 (X)                                                                    | 2,700                                                          | 2.50E+05                                                                                          | 5.50E+09                                                         | 4.00E+05                                             | 2,700                                                              | 6.90E+09                                                             | 1.90E+6 (C)                                          | NA                               | NA                                                                          | NM          | --                  | NM          | --                   | NM                    | --                  | NM          | --                  | NM          | --                  | NM          | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |    |
| TETRACHLOROETHYLENE                | 127-18-4   | 220 (X)                                                                    | 100                                                            | 11,000                                                                                            | 2.70E+09                                                         | 2.0E+5 (C)                                           | 100                                                                | 1.20E+09                                                             | 9.30E+5 (C)                                          | 6.2 (M)                          | 12 (M)                                                                      | NM          | --                  | NM          | --                   | NM                    | --                  | NM          | --                  | NM          | --                  | NM          | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |    |
| TOLUENE                            | 108-88-3   | 5,400 (I)                                                                  | 16,000 (I)                                                     | 3.30E+5 (C,I)                                                                                     | 2.70E+10 (I)                                                     | 5E+07 (C,I)                                          | 16,000 (I)                                                         | 1.20E+10 (I)                                                         | 1.60E+8 (C,I)                                        | 3,700                            | 11,000                                                                      | <10 U       | --                  | NM          | --                   | 310                   | --                  | NM          | --                  | 120         | --                  | NM          | --      | 26      | --      | NM      | --      | <10 U   | --      | NM      | -- |    |
| XYLENE - TOTAL                     | 1330-20-7  | 980 (I)                                                                    | 5,600 (I)                                                      | 6.30E+6 (I)                                                                                       | 2.90E+11 (I)                                                     | 4.1E+08 (C,I)                                        | 5,600 (I)                                                          | 1.30E+11 (I)                                                         | 1.00E+9 (C,D,I)                                      | 280 (J)                          | 830 (J)                                                                     | <30 U       | --                  | NM          | --                   | 17,000 [2,4,11,18,19] | NM                  | --          | 270                 | --          | NM                  | --          | 180     | --      | NM      | --      | <30 U   | --      | NM      | --      | NM | -- |
| Organics - Pesticides (ug/kg)      |            |                                                                            |                                                                |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |             |                     |             |                      |                       |                     |             |                     |             |                     |             |         |         |         |         |         |         |         |         |    |    |
| 4,4-DDE                            | 72-55-9    | NLL                                                                        | NLL                                                            | NLV                                                                                               | 3.20E+07                                                         | 45,000                                               | NLL                                                                | 4.00E+07                                                             | 1.90E+05                                             | NA                               | NA                                                                          | NM          | --                  | NM          | --                   | NM                    | --                  | NM          | --                  | NM          | --                  | NM          | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |    |
| 4,4-DDT                            | 50-29-3    | NLL                                                                        | NLL                                                            | NLV                                                                                               | 3.20E+07                                                         | 57,000                                               | NLL                                                                | 4.00E+07                                                             | 2.80E+05                                             | NA                               | NA                                                                          | NM          | --                  | NM          | --                   | NM                    | --                  | NM          | --                  | NM          | --                  | NM          | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |    |
| ALDRIN                             | 309-00-2   | NLL                                                                        | NLL                                                            | 1.30E+06                                                                                          | 6.40E+05                                                         | 1,000                                                | NLL                                                                | 8.00E+05                                                             | 4,300                                                | NA                               | NA                                                                          | NM          | --                  | NM          | --                   | NM                    | --                  | NM          | --                  | NM          | --                  | NM          | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |    |
| ALPHA-CHLORDANE                    | 5103-71-9  | NA                                                                         | NA                                                             | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM          | --                  | NM          | --                   | NM                    | --                  | NM          | --                  | NM          | --                  | NM          | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |    |
| BETA-BHC                           | 319-85-7   | ID                                                                         | 37                                                             | NLV                                                                                               | 5.90E+06                                                         | 5,400                                                | 150                                                                | 7.40E+06                                                             | 25,000                                               | NA                               | NA                                                                          | NM          | --                  | NM          | --                   | NM                    | --                  | NM          | --                  | NM          | --                  | NM          | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |    |
| ENDOSULFAN I                       | 959-98-8   | NLL                                                                        | NLL                                                            | ID                                                                                                | ID                                                               | 1.4E+06 (J)                                          | NLL                                                                | ID                                                                   | 4.40E+06 (J)                                         | NA                               | NA                                                                          | NM          | --                  | NM          | --                   | NM                    | --                  | NM          | --                  | NM          | --                  | NM          | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |    |
| ENDRIN KETONE                      | 53494-70-5 | NA                                                                         | NA                                                             | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM          | --                  | NM          | --                   | NM                    | --                  | NM          | --                  | NM          | --                  | NM          | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |    |
| GAMMA-CHLORDANE                    | 5103-74-2  | NA                                                                         | NA                                                             | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM          | --                  | NM          | --                   | NM                    | --                  | NM          | --                  | NM          | --                  | NM          | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |    |
| HEPTACHLOR                         | 76-44-8    | NLL                                                                        | NLL                                                            | 3.50E+05                                                                                          | 2.40E+06                                                         | 5,600                                                | NLL                                                                | 3.00E+06                                                             | 23,000                                               | NA                               | NA                                                                          | NM          | --                  | NM          | --                   | NM                    | --                  | NM          | --                  | NM          | --                  | NM          | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |    |
| Other                              |            |                                                                            |                                                                |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |             |                     |             |                      |                       |                     |             |                     |             |                     |             |         |         |         |         |         |         |         |         |    |    |
| CHLORIDE (mg/kg)                   | --         | 94 (X)                                                                     | 5,000                                                          | NLV                                                                                               | ID                                                               | 500 (F)                                              | 5,000                                                              | ID                                                                   | 500 (F)                                              | NA                               | NA                                                                          | NM          | --                  | NM          | --                   | NM                    | --                  | NM          | --                  | NM          | --                  | NM          | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |    |
| PERCENT MOISTURE (%)               | --         | NA                                                                         | NA                                                             | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM          | --                  | NM          | --                   | NM                    | --                  | NM          | --                  | NM          | --                  | NM          | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |    |
| HYDROCARBONS, TOTAL (mg/kg)        | --         | NA                                                                         | NA                                                             | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM          | --                  | NM          | --                   | NM                    | --                  | NM          | --                  | NM          | --                  | NM          | --      | NM      | --      | NM      | --      | NM      | --      | NM      | -- |    |

Note: Analytical and Criteria Footnotes are included on the last page of the table

TABLE 6-1  
Summary of Soil Analytical Results  
Area B  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code                |            | EGLE Part 201 Generic Cleanup Criteria                                     |                                                                |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                          | Area B                           |                          |                                  |                          |                                  |                          |                        |                        |                        |                        |         |        |         |        |         |        |         |        |         |      |    |
|------------------------------|------------|----------------------------------------------------------------------------|----------------------------------------------------------------|---------------------------------------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------------------|----------------------------------------------------------------------|------------------------------------------------------|----------------------------------|-----------------------------------------------------------------------------|--------------------------|----------------------------------|--------------------------|----------------------------------|--------------------------|----------------------------------|--------------------------|------------------------|------------------------|------------------------|------------------------|---------|--------|---------|--------|---------|--------|---------|--------|---------|------|----|
| Station Name                 | CAS Number | [2]<br>Groundwater<br>Surface Water<br>Interface<br>Protection<br>Criteria | [4]<br>Residential<br>Drinking Water<br>Protection<br>Criteria | [5]<br>Residential<br>Soil<br>Volatilization<br>to Indoor Air<br>Inhalation<br>Criteria<br>(VSIC) | [9]<br>Residential<br>Particulate<br>Soil Inhalation<br>Criteria | [10]<br>Residential<br>Direct<br>Contact<br>Criteria | [11]<br>Nonresidential<br>Drinking Water<br>Protection<br>Criteria | [16]<br>Nonresidential<br>Particulate<br>Soil Inhalation<br>Criteria | [17]<br>Nonresidential<br>Direct Contact<br>Criteria | [18]<br>Soil Residential<br>MSSL | [19]<br>Soil<br>Nonresidential<br>MSSL                                      | SB-113                   |                                  |                          |                                  | SB-114                   |                                  |                          |                        | SB-201                 |                        |                        |         | SB-501 |         | PR-1   |         | T1-N   |         | T1-S   |         | T2-N |    |
| Field Sample ID              |            |                                                                            |                                                                |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | 5406 SB-113<br>7/20/1995 | 5406 SB-113 Cleanup<br>7/20/1995 | 5412 SB-114<br>7/20/1995 | 5412 SB-114 Cleanup<br>7/20/1995 | 5410 SB-201<br>7/20/1995 | 5410 SB-201 Cleanup<br>7/20/1995 | 5408 SB-501<br>7/20/1995 | PR-1 10149<br>7/8/1998 | T1-N 10143<br>7/8/1998 | T1-S 10144<br>7/8/1998 | T2-N 10145<br>7/8/1998 |         |        |         |        |         |        |         |        |         |      |    |
| Sample Date                  |            |                                                                            |                                                                |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | --                       | --                               | --                       | --                               | --                       | --                               | --                       | --                     | --                     | --                     | --                     |         |        |         |        |         |        |         |        |         |      |    |
| Sample Interval (bgs)        |            |                                                                            |                                                                |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | --                       | --                               | --                       | --                               | --                       | --                               | --                       | --                     | --                     | --                     | --                     |         |        |         |        |         |        |         |        |         |      |    |
| Sample Description           |            |                                                                            |                                                                |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | --                       | --                               | --                       | --                               | --                       | --                               | --                       | --                     | --                     | --                     | --                     |         |        |         |        |         |        |         |        |         |      |    |
|                              |            |                                                                            |                                                                |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | --                       | --                               | --                       | --                               | --                       | --                               | --                       | --                     | --                     | --                     | --                     | --      |        |         |        |         |        |         |        |         |      |    |
|                              |            | Result                                                                     | Exceeds                                                        | Result                                                                                            | Exceeds                                                          | Result                                               | Exceeds                                                            | Result                                                               | Exceeds                                              | Result                           | Exceeds                                                                     | Result                   | Exceeds                          | Result                   | Exceeds                          | Result                   | Exceeds                          | Result                   | Exceeds                | Result                 | Exceeds                | Result                 | Exceeds | Result | Exceeds | Result | Exceeds | Result | Exceeds | Result | Exceeds |      |    |
| Inorganics - Metals (mg/kg)  |            |                                                                            |                                                                |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |                          |                                  |                          |                                  |                          |                                  |                          |                        |                        |                        |                        |         |        |         |        |         |        |         |        |         |      |    |
| ALUMINUM                     | 7429-90-5  | NA                                                                         | 6900 (B)                                                       | NLV                                                                                               | ID                                                               | 50,000 (D,BB)                                        | 6,900 (B)                                                          | ID                                                                   | 3.7E+5 (D,BB)                                        | NA                               | NA                                                                          | NM                       | --                               | NM                       | --                               | NM                       | --                               | NM                       | --                     | NM                     | --                     | NM                     | --      | NM     | --      | NM     | --      | NM     | --      | NM     | --      | NM   | -- |
| ANTIMONY                     | 7440-36-0  | 1.2 (X)                                                                    | 4.3                                                            | NLV                                                                                               | 13,000                                                           | 180                                                  | 4.3                                                                | 5,900                                                                | 670                                                  | NA                               | NA                                                                          | NM                       | --                               | NM                       | --                               | NM                       | --                               | NM                       | --                     | NM                     | --                     | NM                     | --      | NM     | --      | NM     | --      | NM     | --      | NM     | --      | NM   | -- |
| ARSENIC                      | 7440-38-2  | 4.6                                                                        | 4.6                                                            | NLV                                                                                               | 720                                                              | 7.6                                                  | 4.6                                                                | 910                                                                  | 37                                                   | NA                               | NA                                                                          | NM                       | --                               | NM                       | --                               | NM                       | --                               | NM                       | --                     | NM                     | --                     | NM                     | --      | NM     | --      | NM     | --      | NM     | --      | NM     | --      | NM   | -- |
| BARIUM                       | 7440-39-3  | 130 (B,G)                                                                  | 1,300 (B)                                                      | NLV                                                                                               | 3.3E+5 (B)                                                       | 37,000 (B)                                           | 1,300 (B)                                                          | 1.5E+5 (B)                                                           | 1.3E+5 (B)                                           | NA                               | NA                                                                          | NM                       | --                               | NM                       | --                               | NM                       | --                               | NM                       | --                     | NM                     | --                     | NM                     | --      | NM     | --      | NM     | --      | NM     | --      | NM     | --      | NM   | -- |
| BERYLLIUM                    | 7440-41-7  | 24 (G)                                                                     | 51                                                             | NLV                                                                                               | 1,300                                                            | 410                                                  | 51                                                                 | 590                                                                  | 1,600                                                | NA                               | NA                                                                          | NM                       | --                               | NM                       | --                               | NM                       | --                               | NM                       | --                     | NM                     | --                     | NM                     | --      | NM     | --      | NM     | --      | NM     | --      | NM     | --      | NM   | -- |
| CADMIUM                      | 7440-43-9  | 1.6 (B,G,X)                                                                | 6.0 (B)                                                        | NLV                                                                                               | 1,700 (B)                                                        | 550 (B)                                              | 6.0 (B)                                                            | 2,200 (B)                                                            | 2,100 (B)                                            | NA                               | NA                                                                          | NM                       | --                               | NM                       | --                               | NM                       | --                               | <0.05 U                  | --                     | NM                     | --                     | NM                     | --      | NM     | --      | NM     | --      | NM     | --      | NM     | --      | NM   | -- |
| CALCIUM                      | 7440-70-2  | NA                                                                         | NA                                                             | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM                       | --                               | NM                       | --                               | NM                       | --                               | NM                       | --                     | NM                     | --                     | NM                     | --      | NM     | --      | NM     | --      | NM     | --      | NM     | --      | NM   | -- |
| CHROMIUM                     | 7440-47-3  | 1.2E+6 (B,G,H,X)                                                           | 1.0E+6 (B,D,H)                                                 | NLV                                                                                               | 3.30E+8 (B,H)                                                    | 7.90E+5 (B,H)                                        | 1.00E+6 (B,D,H)                                                    | 1.50E+5 (B,H)                                                        | 1.00E+6 (B,D,H)                                      | NA                               | NA                                                                          | NM                       | --                               | NM                       | --                               | NM                       | --                               | 8.7                      | --                     | NM                     | --                     | NM                     | --      | NM     | --      | NM     | --      | NM     | --      | NM     | --      | NM   | -- |
| COBALT                       | 7440-48-4  | 2                                                                          | 0.8                                                            | NLV                                                                                               | 13,000                                                           | 2,600                                                | 2                                                                  | 5,900                                                                | 9,000                                                | NA                               | NA                                                                          | NM                       | --                               | NM                       | --                               | NM                       | --                               | NM                       | --                     | NM                     | --                     | NM                     | --      | NM     | --      | NM     | --      | NM     | --      | NM     | --      | NM   | -- |
| COPPER                       | 7440-50-8  | 32 (B,G)                                                                   | 5,800 (B)                                                      | NLV                                                                                               | 130,000 (B)                                                      | 20,000 (B)                                           | 5,800 (B)                                                          | 59,000 (B)                                                           | 73,000 (B)                                           | NA                               | NA                                                                          | NM                       | --                               | NM                       | --                               | NM                       | --                               | NM                       | --                     | NM                     | --                     | NM                     | --      | NM     | --      | NM     | --      | NM     | --      | NM     | --      | NM   | -- |
| IRON                         | 7439-89-6  | --                                                                         | 12,000 (B)                                                     | NLV                                                                                               | ID                                                               | 160,000 (B)                                          | 12,000 (B)                                                         | ID                                                                   | 580,000 (B)                                          | NA                               | NA                                                                          | NM                       | --                               | NM                       | --                               | NM                       | --                               | NM                       | --                     | NM                     | --                     | NM                     | --      | NM     | --      | NM     | --      | NM     | --      | NM     | --      | NM   | -- |
| LEAD                         | 7439-92-1  | 2,500 (B,G,X)                                                              | 700 (B)                                                        | NLV                                                                                               | 100,000 (B)                                                      | 400 (B)                                              | 700 (B)                                                            | 44,000 (B)                                                           | 900 (B,DD)                                           | NA                               | NA                                                                          | 7                        | --                               | NM                       | --                               | 17                       | --                               | NM                       | --                     | 40                     | --                     | NM                     | --      | NM     | --      | NM     | --      | NM     | --      | NM     | --      | NM   | -- |
| LITHIUM                      | 7439-93-2  | 9.8 (B)                                                                    | 9.8 (B)                                                        | NLV                                                                                               | 2.30E+9 (B)                                                      | 4,200 (B,DD)                                         | 9.8 (B)                                                            | 1.00E+6 (B)                                                          | 31,000 (B,DD)                                        | NA                               | NA                                                                          | NM                       | --                               | NM                       | --                               | NM                       | --                               | NM                       | --                     | NM                     | --                     | NM                     | --      | NM     | --      | NM     | --      | NM     | --      | NM     | --      | NM   | -- |
| MAGNESIUM                    | 7439-95-4  | --                                                                         | 8,000 (B)                                                      | NLV                                                                                               | 6.70E+6 (B)                                                      | 1.0E+9 (B,D)                                         | 22,000 (B)                                                         | 2.90E+6 (B)                                                          | 1.00E+6 (B,D)                                        | NA                               | NA                                                                          | NM                       | --                               | NM                       | --                               | NM                       | --                               | NM                       | --                     | NM                     | --                     | NM                     | --      | NM     | --      | NM     | --      | NM     | --      | NM     | --      | NM   | -- |
| MANGANESE                    | 7439-96-5  | 440 (B,G,X)                                                                | 440 (B)                                                        | NLV                                                                                               | 3,300 (B)                                                        | 25,000 (B)                                           | 440 (B)                                                            | 1,500 (B)                                                            | 90,000 (B)                                           | NA                               | NA                                                                          | NM                       | --                               | NM                       | --                               | NM                       | --                               | NM                       | --                     | NM                     | --                     | NM                     | --      | NM     | --      | NM     | --      | NM     | --      | NM     | --      | NM   | -- |
| MERCURY                      | 7439-97-6  | 0.13 (B,Z)                                                                 | 1.7 (B,Z)                                                      | 48 (B,Z)                                                                                          | 20,000 (B,Z)                                                     | 160 (B,Z)                                            | 1.7 (B,Z)                                                          | 8,800 (B,Z)                                                          | 580 (B,Z)                                            | 0.022 (M)                        | 0.066                                                                       | NM                       | --                               | NM                       | --                               | NM                       | --                               | NM                       | --                     | NM                     | --                     | NM                     | --      | NM     | --      | NM     | --      | NM     | --      | NM     | --      | NM   | -- |
| NICKEL                       | 7440-02-0  | 29 (G)                                                                     | 100 (B)                                                        | NLV                                                                                               | 13,000 (B)                                                       | 40,000 (B)                                           | 100 (B)                                                            | 16,000 (B)                                                           | 1.50E+5 (B)                                          | NA                               | NA                                                                          | NM                       | --                               | NM                       | --                               | NM                       | --                               | NM                       | --                     | NM                     | --                     | NM                     | --      | NM     | --      | NM     | --      | NM     | --      | NM     | --      | NM   | -- |
| POTASSIUM                    | 7440-09-7  | NA                                                                         | NA                                                             | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM                       | --                               | NM                       | --                               | NM                       | --                               | NM                       | --                     | NM                     | --                     | NM                     | --      | NM     | --      | NM     | --      | NM     | --      | NM     | --      | NM   | -- |
| SELENIUM                     | 7782-49-2  | 0.41 (B)                                                                   | 4.0 (B)                                                        | NLV                                                                                               | 130,000 (B)                                                      | 2,600 (B)                                            | 4.0 (B)                                                            | 59,000 (B)                                                           | 9,600 (B)                                            | NA                               | NA                                                                          | NM                       | --                               | NM                       | --                               | NM                       | --                               | NM                       | --                     | NM                     | --                     | NM                     | --      | NM     | --      | NM     | --      | NM     | --      | NM     | --      | NM   | -- |
| SILVER                       | 7440-22-4  | 1.0 (B,M)                                                                  | 4.5 (B)                                                        | NLV                                                                                               | 6700 (B)                                                         | 2500 (B)                                             | 13 (B)                                                             | 2,900 (B)                                                            | 9,000 (B)                                            | NA                               | NA                                                                          | NM                       | --                               | NM                       | --                               | NM                       | --                               | NM                       | --                     | NM                     | --                     | NM                     | --      | NM     | --      | NM     | --      | NM     | --      | NM     | --      | NM   | -- |
| SODIUM                       | 7440-23-5  | NA                                                                         | 4,600                                                          | NLV                                                                                               | ID                                                               | 1.0E+6 (D)                                           | NA                                                                 | ID                                                                   | 1.0E+6 (D)                                           | NA                               | NA                                                                          | NM                       | --                               | NM                       | --                               | NM                       | --                               | NM                       | --                     | NM                     | --                     | NM                     | --      | NM     | --      | NM     | --      | NM     | --      | NM     | --      | NM   | -- |
| VANADIUM                     | 7440-62-2  | 430                                                                        | 72                                                             | NLV                                                                                               | ID                                                               | 750 (DD)                                             | 990                                                                | ID                                                                   | 5,500 (DD)                                           | NA                               | NA                                                                          | NM                       | --                               | NM                       | --                               | NM                       | --                               | NM                       | --                     | NM                     | --                     | NM                     | --      | NM     | --      | NM     | --      | NM     | --      | NM     | --      | NM   | -- |
| ZINC                         | 7440-66-6  | 62 (B,G)                                                                   | 2,400 (B)                                                      | NLV                                                                                               | ID                                                               | 1.70E+5 (B)                                          | 5,000 (B)                                                          | ID                                                                   | 6.30E+5 (B)                                          | NA                               | NA                                                                          | NM                       | --                               | NM                       | --                               | NM                       | --                               | NM                       | --                     | NM                     | --                     | NM                     | --      | NM     | --      | NM     | --      | NM     | --      | NM     | --      | NM   | -- |
| Inorganics - Cyanide (mg/kg) |            |                                                                            |                                                                |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |                          |                                  |                          |                                  |                          |                                  |                          |                        |                        |                        |                        |         |        |         |        |         |        |         |        |         |      |    |
| CYANIDE                      | 57-12-5    | 0.1 (P,R)                                                                  | 4.0 (P,R)                                                      | NLV                                                                                               | 250 (P,R)                                                        | 12 (P,R)                                             | 4.0 (P,R)                                                          | 250 (P,R)                                                            | 250 (P,R)                                            | NA                               | NA                                                                          | NM                       | --                               | NM                       | --                               | NM                       | --                               | NM                       | --                     | NM                     | --                     | NM                     | --      | NM     | --      | NM     | --      | NM     | --      | NM     | --      | NM   | -- |
| Organics - PCBs (ug/kg)      |            |                                                                            |                                                                |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |                          |                                  |                          |                                  |                          |                                  |                          |                        |                        |                        |                        |         |        |         |        |         |        |         |        |         |      |    |
| AROCLO-1260                  | 11096-82-5 | NA                                                                         | NA                                                             | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM                       | --                               | NM                       | --                               | NM                       | --                               | NM                       | --                     | <330 U                 | --                     | NM                     | --      | NM     | --      | NM     | --      | NM     | --      | NM     | --      | NM   | -- |
| AROCLO-1262                  | 37324-23-5 | NA                                                                         | NA                                                             | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM                       | --                               | NM                       | --                               | NM                       | --                               | NM                       | --                     | <330 U                 | --                     | NM                     | --      | NM     | --      | NM     | --      | NM     | --      | NM     | --      | NM   | -- |
| TOTAL PCBs                   | 1336-36-6  | NLL                                                                        | NLL                                                            | 3.00E+6 (J,T)                                                                                     | 5.20E+6 (J,T)                                                    | 1,000 (J,T)                                          | NLL                                                                | 6.50E+6 (J,T)                                                        | 1,000 (J,T)                                          | NA                               | NA                                                                          | NM                       | --                               | NM                       | --                               | NM                       | --                               | NM                       | --                     | ND                     | --                     | NM                     | --      | NM     | --      | NM     | --      | NM     | --      | NM     | --      | NM   | -- |
| Organics - SVOCs (ug/kg)     |            |                                                                            |                                                                |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |                          |                                  |                          |                                  |                          |                                  |                          |                        |                        |                        |                        |         |        |         |        |         |        |         |        |         |      |    |
| 1,1-BIPHENYL                 | 92-52-4    | NA                                                                         | NA                                                             | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM                       | --                               | NM                       | --                               | NM                       | --                               | NM                       | --                     | NM                     | --                     | NM                     | --      | NM     | --      | NM     | --      | NM     | --      | NM     | --      | NM   | -- |
| 2-METHYLNAPHTHALENE (SVOC)   | 91-57-6S   | 4,200                                                                      | 57,000                                                         | 2.70E+06                                                                                          | 6.70E+08                                                         | 8.10E+06                                             | 1.70E+05                                                           | 2.90E+08                                                             | 2.60E+07                                             | NA                               | NA                                                                          | NM                       | --                               | NM                       | --                               | NM                       | --                               | NM                       | --                     | NM                     | --                     | NM                     | --      | NM     | --      | 9,700  | [2]     | <330 U | --      | <330 U | --      | NM   | -- |
| ACENAPHTHENE                 | 83-32-9    | 8,700                                                                      | 3.00E+05                                                       | 1.90E+08                                                                                          | 1.40E+10                                                         | 4.10E+07                                             | 8.80E+05                                                           | 6.20E+09                                                             | 1.30E+08                                             | NA                               | NA                                                                          | <560 U                   | --                               | <330 UJ                  | --                               | <690 U                   | --                               | <330 UJ                  | --                     | <4500 U                | --                     | <330 UJ                | --      | NM     | --      | 560    | --      | <330 U | --      | <330 U | --      | NM   | -- |
| ACENAPHTHYLENE               | 208-96-8   | ID                                                                         | 5,900                                                          | 1.60E+06                                                                                          | 2.30E+09                                                         | 1.60E+06                                             | 17,000                                                             | 1.00E+09                                                             | 5.20E+06                                             | NA                               | NA                                                                          | 700                      | --                               | <330 UJ                  | --                               | <690 U                   | --                               | <330 UJ                  | --                     | <4500 U                | --                     | <330 UJ                | --      | NM     | --      | <330 U | --      | <330 U | --      | <330 U | --      | NM   | -- |
| ACETOPHENONE                 | 98-86-2    | ID                                                                         | 30,000                                                         | 1.20E+8 (C)                                                                                       | 3.30E+10                                                         | 4.70E+7 (C)                                          | 88,000                                                             | 1.40E+10                                                             | 1.50E+8 (C)                                          | NA                               | NA                                                                          | NM                       | --                               | NM                       | --                               | NM                       | --                               | NM                       | --                     | NM                     | --                     | NM                     | --      | NM     | --      | NM     | --      | NM     | --      | NM     | --      | NM   | -- |
| ANTHRACENE                   | 120-12-7   | ID                                                                         | 41,000                                                         | 1.00E+9 (D)                                                                                       | 6.70E+10                                                         | 2.30E+08                                             | 41,000                                                             | 2.90E+10                                                             | 7.30E+08                                             | NA                               | NA                                                                          | 8,700                    | --                               | 870 J                    | --                               | 1,300                    | --                               | 640 J                    | --                     | 5,400                  | --                     | 1,300 J                | --      | NM     | --      | <330 U | --      | <330 U | --      | <330 U | --      | NM   | -- |
| BENZALDEHYDE                 | 100-52-7   | NA                                                                         | NA                                                             | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM                       | --                               | NM                       | --                               | NM                       | --                               | NM                       | --                     | NM                     | --                     | NM                     | --      | NM     | --      | NM     | --      | NM     | --      | NM     | --      | NM   | -- |
| BENZO(A)ANTHRACENE           | 56-55-3    | NLL                                                                        | NLL                                                            | NLV                                                                                               | ID                                                               | 20,000 (Q)                                           | NLL                                                                | ID                                                                   | 80,000 (Q)                                           | NA                               | NA                                                                          | 16,000                   | --                               | <330 UJ                  | --                               | 2,900                    | --                               | 1,500 J                  | --                     | <4500 U                | --                     | 600 J                  | --      | NM     | --      | <330 U | --      | <330 U | --      | <330 U | --      | NM   | -- |
| BENZO(A)PYRENE               | 50-32-8    | NLL                                                                        | NLL                                                            | NLV                                                                                               | 1.50E+8 (Q)                                                      | 2,000 (Q)                                            | NLL                                                                | 1.90E+6 (Q)                                                          | 8,000 (Q)                                            | NA                               | NA                                                                          | 14,000                   | [10,17]                          | <330 UJ                  | --                               | 2,100                    | [10]                             | 930 J                    | --                     | <4500 U                | --                     | 330 J                  | --      | NM     | --      | <330 U | --      | <330 U | --      | <330 U | --      | NM   | -- |
| BENZO(B)FLUORANTHENE         | 205-99-2   | NLL                                                                        | NLL                                                            | ID                                                                                                | ID                                                               | 20,000 (Q)                                           | NLL                                                                | ID                                                                   | 80,000 (Q)                                           | NA                               | NA                                                                          | 13,000                   | --                               | <330 UJ                  | --                               | 2,400                    | --                               | 1,200 J                  | --                     | <4500 U                | --                     | 410 J                  | --      | NM     | --      | <330 U | --      | <330 U | --      | <330 U | --      | NM   | -- |
| BENZO(G,H,I)PERYLENE         | 191-24-2   | NLL                                                                        | NLL                                                            | NLV                                                                                               | 8.00E+08                                                         | 2.50E+06                                             | NLL                                                                | 3.50E+08                                                             | 7.00E+06                                             | NA                               | NA                                                                          | 5,td                     |                                  |                          |                                  |                          |                                  |                          |                        |                        |                        |                        |         |        |         |        |         |        |         |        |         |      |    |

**TABLE 6-1**  
**Summary of Soil Analytical Results**  
**Area B**  
**Quincy Mining Company Portage Operations Area**  
**Abandoned Mining Wastes - Torch Lake Non-Superfund Site**

| Location Code                      |            | EGLE Part 201 Generic Cleanup Criteria                                     |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |             | Area B              |             |                     |             |                     |             |            |            |              |            |         |        |         |        |         |        |         |        |    |       |    |
|------------------------------------|------------|----------------------------------------------------------------------------|-------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------------------|----------------------------------------------------------------------|------------------------------------------------------|----------------------------------|-----------------------------------------------------------------------------|-------------|---------------------|-------------|---------------------|-------------|---------------------|-------------|------------|------------|--------------|------------|---------|--------|---------|--------|---------|--------|---------|--------|----|-------|----|
| Station Name                       | CAS Number | [2]<br>Groundwater<br>Surface Water<br>Interface<br>Protection<br>Criteria | [4]<br>Residential<br>Drinking<br>Water<br>Protection<br>Criteria | [5]<br>Residential<br>Soil<br>Volatilization<br>to Indoor Air<br>Inhalation<br>Criteria<br>(VSIC) | [9]<br>Residential<br>Particulate<br>Soil Inhalation<br>Criteria | [10]<br>Residential<br>Direct<br>Contact<br>Criteria | [11]<br>Nonresidential<br>Drinking Water<br>Protection<br>Criteria | [16]<br>Nonresidential<br>Particulate<br>Soil Inhalation<br>Criteria | [17]<br>Nonresidential<br>Direct Contact<br>Criteria | [18]<br>Soil Residential<br>MSSL | [19]<br>Soil<br>Nonresidential<br>MSSL                                      | SB-113      |                     | SB-114      |                     | SB-201      |                     | SB-501      |            | PR-1       |              | T1-N       |         | T1-S   |         | T2-N   |         |        |         |        |    |       |    |
| Field Sample ID                    |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | 5406 SB-113 | 5406 SB-113 Cleanup | 5412 SB-114 | 5412 SB-114 Cleanup | 5410 SB-201 | 5410 SB-201 Cleanup | 5408 SB-501 | PR-1 10149 | T1-N 10143 | T1-S 10144   | T2-N 10145 |         |        |         |        |         |        |         |        |    |       |    |
| Sample Date                        |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | 7/20/1995   | 7/20/1995           | 7/20/1995   | 7/20/1995           | 7/20/1995   | 7/20/1995           | 7/20/1995   | 7/8/1998   | 7/8/1998   | 7/8/1998     | 7/8/1998   |         |        |         |        |         |        |         |        |    |       |    |
| Sample Interval (bgs)              |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | --          | --                  | --          | --                  | --          | --                  | --          | --         | --         | --           | --         |         |        |         |        |         |        |         |        |    |       |    |
| Sample Description                 |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | --          | --                  | --          | --                  | --          | --                  | --          | --         | --         | --           | --         |         |        |         |        |         |        |         |        |    |       |    |
|                                    |            | Result                                                                     | Exceeds                                                           | Result                                                                                            | Exceeds                                                          | Result                                               | Exceeds                                                            | Result                                                               | Exceeds                                              | Result                           | Exceeds                                                                     | Result      | Exceeds             | Result      | Exceeds             | Result      | Exceeds             | Result      | Exceeds    | Result     | Exceeds      | Result     | Exceeds | Result | Exceeds | Result | Exceeds | Result | Exceeds |        |    |       |    |
| Organics - SVOCs (ug/kg) Continued |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |             |                     |             |                     |             |                     |             |            |            |              |            |         |        |         |        |         |        |         |        |    |       |    |
| DIBENZO(A,H)ANTHRACENE             | 53-70-3    | NLL                                                                        | NLL                                                               | NLV                                                                                               | ID                                                               | 2,000 (Q)                                            | NLL                                                                | ID                                                                   | 8,000 (Q)                                            | NA                               | NA                                                                          | 3,000       | [10]                | <330 UJ     | --                  | <690 U      | --                  | <330 UJ     | --         | <4500 U    | --           | <330 UJ    | --      | NM     | --      | <330 U | --      | <330 U | --      | NM     | -- |       |    |
| DIBENZOFURAN                       | 132-64-9   | 1,700                                                                      | ID                                                                | 2.00E+06                                                                                          | 6.70E+06                                                         | ID                                                   | ID                                                                 | 2.90E+06                                                             | ID                                                   | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --         | NM         | --           | NM         | --      | NM     | --      | NM     | --      | NM     | --      | NM     | -- |       |    |
| FLUORANTHENE                       | 206-44-0   | 5,500                                                                      | 730,000                                                           | 1.00E+9 (D)                                                                                       | 9.30E+09                                                         | 4.60E+07                                             | 730,000                                                            | 4.10E+09                                                             | 1.30E+08                                             | NA                               | NA                                                                          | 6,200       | [2]                 | 700 J       | --                  | 4,000       | --                  | 2,200 J     | --         | <4500 U    | --           | 930 J      | --      | NM     | --      | <330 U | --      | 740    | --      | <330 U | -- | NM    | -- |
| FLUORENE                           | 86-73-7    | 5,300                                                                      | 390,000                                                           | 5.80E+08                                                                                          | 9.30E+09                                                         | 2.70E+07                                             | 890,000                                                            | 4.10E+09                                                             | 8.70E+07                                             | NA                               | NA                                                                          | 940         | --                  | <330 UJ     | --                  | <690 U      | --                  | <330 UJ     | --         | <4500 U    | --           | <330 UJ    | --      | NM     | --      | 1,200  | --      | <330 U | --      | <330 U | -- | NM    | -- |
| INDENO(1,2,3-CD)PYRENE             | 193-39-5   | NLL                                                                        | NLL                                                               | NLV                                                                                               | ID                                                               | 20,000 (Q)                                           | NLL                                                                | ID                                                                   | 80,000 (Q)                                           | NA                               | NA                                                                          | 5,700       | --                  | <330 UJ     | --                  | <690 U      | --                  | <330 UJ     | --         | <4500 U    | --           | <330 UJ    | --      | NM     | --      | <330 U | --      | <330 U | --      | <330 U | -- | NM    | -- |
| NAPHTHALENE (SVOC)                 | 91-20-3S   | 730                                                                        | 35,000                                                            | 2.50E+05                                                                                          | 2.00E+08                                                         | 1.60E+07                                             | 1.00E+05                                                           | 8.80E+07                                                             | 5.20E+07                                             | NA                               | NA                                                                          | <560 U      | --                  | <330 UJ     | --                  | <690 U      | --                  | <330 UJ     | --         | 15,000     | [2]          | 3,100 J    | [2]     | NM     | --      | <330 U | --      | <330 U | --      | <330 U | -- | NM    | -- |
| PHENANTHRENE                       | 85-01-8    | 2,100                                                                      | 56,000                                                            | 2.80E+06                                                                                          | 6.70E+06                                                         | 1.60E+06                                             | 1.60E+05                                                           | 2.90E+06                                                             | 5.20E+06                                             | NA                               | NA                                                                          | 1,700       | --                  | <330 UJ     | --                  | <690 U      | --                  | <330 UJ     | --         | <4500 U    | --           | <330 UJ    | --      | NM     | --      | 2,200  | [2]     | <330 U | --      | <330 U | -- | NM    | -- |
| PYRENE                             | 129-00-0   | ID                                                                         | 4.80E+05                                                          | 1.00E+9 (D)                                                                                       | 6.70E+09                                                         | 2.90E+07                                             | 4.80E+05                                                           | 2.90E+09                                                             | 8.40E+07                                             | NA                               | NA                                                                          | 39,000      | --                  | 620 J       | --                  | 6,100       | --                  | 2,600 J     | --         | <4500 U    | --           | 970 J      | --      | NM     | --      | 710    | --      | 880    | --      | <330 U | -- | NM    | -- |
| Organics - VOCs (ug/kg)            |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |             |                     |             |                     |             |                     |             |            |            |              |            |         |        |         |        |         |        |         |        |    |       |    |
| 1,2,3-TRIMETHYLBENZENE             | 526-73-8   | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | 270 (JT)                         | 800 (JT)                                                                    | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --         | NM         | --           | NM         | --      | NM     | --      | NM     | --      | NM     | --      | NM     | -- |       |    |
| 1,2,4-TRIMETHYLBENZENE             | 95-63-6    | 570 (I)                                                                    | 2,100 (I)                                                         | 4.3E+6 (C,I)                                                                                      | 8.20E+10 (I)                                                     | 3.2E+07 (C,I)                                        | 2,100 (I)                                                          | 3.60E+10 (I)                                                         | 1.00E+8 (C,I)                                        | 150 (JT)                         | 430 (JT)                                                                    | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --         | NM         | --           | NM         | --      | NM     | --      | NM     | --      | NM     | --      | NM     | -- |       |    |
| 1,3,5-TRIMETHYLBENZENE             | 110-82-7   | 1,100 (I)                                                                  | 1,800 (I)                                                         | 2.6E+6 (C,I)                                                                                      | 8.20E+10 (I)                                                     | 3.2E+07 (C)                                          | 2,100 (I)                                                          | 3.60E+10 (I)                                                         | 1.00E+8 (C,I)                                        | 100 (JT)                         | 300 (JT)                                                                    | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --         | NM         | --           | NM         | --      | NM     | --      | NM     | --      | NM     | --      | NM     | -- |       |    |
| 2,2,4-TRIMETHYLPENTANE             | 540-84-1   | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --         | NM         | --           | NM         | --      | NM     | --      | NM     | --      | NM     | --      | NM     | -- |       |    |
| 2-METHYLNAPHTHALENE (VOC)          | 91-57-6V   | 4,200                                                                      | 57,000                                                            | 2.70E+06                                                                                          | 6.70E+08                                                         | 8.10E+06                                             | 1.70E+05                                                           | 2.90E+08                                                             | 2.60E+07                                             | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --         | NM         | --           | NM         | --      | NM     | --      | NM     | --      | NM     | --      | NM     | -- |       |    |
| BENZENE                            | 71-43-2    | 240 (I,X)                                                                  | 100 (I)                                                           | 1,600 (I)                                                                                         | 3.80E+8 (I)                                                      | 1.8E+5 (I)                                           | 100 (I)                                                            | 4.70E+8 (I)                                                          | 8.40E+5 (C,I)                                        | 1.7 (M)                          | 7.9 (M)                                                                     | <10 U       | --                  | NM          | --                  | <10 U       | --                  | NM          | --         | 215        | [4,11,18,19] | NM         | --      | NM     | --      | <10 U  | --      | NM     | --      | <10 U  | -- |       |    |
| CYCLOHEXANE                        | 110-82-7   | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --         | NM         | --           | NM         | --      | NM     | --      | NM     | --      | NM     | --      | NM     | -- |       |    |
| ETHYLBENZENE                       | 100-41-4   | 360                                                                        | 1,500                                                             | 87,000                                                                                            | 1.00E+10                                                         | 2.20E+07                                             | 1,500                                                              | 1.30E+10                                                             | 7.10E+07                                             | 12 (M)                           | 57                                                                          | <10 U       | --                  | NM          | --                  | 220         | [18,19]             | NM          | --         | 360        | [18,19]      | NM         | --      | NM     | --      | 310    | [18,19] | NM     | --      | NM     | -- | <10 U | -- |
| HEXANE                             | 110-54-3   | NA                                                                         | 1.8E+5 (C)                                                        | 5.1E+5 (C)                                                                                        | 1.30E+10                                                         | 9.2E+7 (C)                                           | 5.10E+5 (C)                                                        | 5.90E+09                                                             | 3.00E+8 (C)                                          | 25                               | 74                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --         | NM         | --           | NM         | --      | NM     | --      | NM     | --      | NM     | --      | NM     | -- |       |    |
| ISOPROPYLBENZENE                   | 98-82-8    | 3,200                                                                      | 91,000                                                            | 4.00E+5 (C)                                                                                       | 5.80E+09                                                         | 2.50E+7 (C)                                          | 2.60E+05                                                           | 2.60E+09                                                             | 8.00E+7 (C)                                          | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --         | NM         | --           | NM         | --      | NM     | --      | NM     | --      | NM     | --      | NM     | -- |       |    |
| M,P-XYLENE                         | 1330-20-7  | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --         | NM         | --           | NM         | --      | NM     | --      | NM     | --      | NM     | --      | NM     | -- |       |    |
| NAPHTHALENE (VOC)                  | 91-20-3V   | 730                                                                        | 35,000                                                            | 2.50E+05                                                                                          | 2.00E+08                                                         | 1.60E+07                                             | 1.00E+05                                                           | 8.80E+07                                                             | 5.20E+07                                             | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --         | NM         | --           | NM         | --      | NM     | --      | NM     | --      | NM     | --      | NM     | -- |       |    |
| N-PROPYLBENZENE                    | 103-65-1   | ID                                                                         | 1,600 (I)                                                         | ID                                                                                                | 1.30E+9 (I)                                                      | 2.50E+6 (I)                                          | 4,600                                                              | 5.90E+08                                                             | 8.00E+06                                             | 1,800                            | 3,500                                                                       | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --         | NM         | --           | NM         | --      | NM     | --      | NM     | --      | NM     | --      | NM     | -- |       |    |
| O-XYLENE                           | 95-47-6    | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --         | NM         | --           | NM         | --      | NM     | --      | NM     | --      | NM     | --      | NM     | -- |       |    |
| P-ISOPROPYL TOLUENE (p-CYMENE)     | 99-87-6    | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --         | NM         | --           | NM         | --      | NM     | --      | NM     | --      | NM     | --      | NM     | -- |       |    |
| SEC-BUTYLBENZENE                   | 135-98-8   | ID                                                                         | 1,600                                                             | ID                                                                                                | 4.00E+08                                                         | 2.50E+06                                             | 4,600                                                              | 1.80E+08                                                             | 8.00E+06                                             | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --         | NM         | --           | NM         | --      | NM     | --      | NM     | --      | NM     | --      | NM     | -- |       |    |
| STYRENE                            | 100-42-5   | 530 (X)                                                                    | 2,700                                                             | 2.50E+05                                                                                          | 5.50E+09                                                         | 4.00E+05                                             | 2,700                                                              | 6.90E+09                                                             | 1.90E+6 (C)                                          | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --         | NM         | --           | NM         | --      | NM     | --      | NM     | --      | NM     | --      | NM     | -- |       |    |
| TETRACHLOROETHYLENE                | 127-18-4   | 220 (X)                                                                    | 100                                                               | 11,000                                                                                            | 2.70E+09                                                         | 2.0E+5 (C)                                           | 100                                                                | 1.20E+09                                                             | 9.30E+5 (C)                                          | 6.2 (M)                          | 12 (M)                                                                      | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --         | <12 U      | --           | NM         | --      | <10 U  | --      | NM     | --      | NM     | --      | NM     | -- |       |    |
| TOLUENE                            | 108-88-3   | 5,400 (I)                                                                  | 16,000 (I)                                                        | 3.30E+5 (C,I)                                                                                     | 2.70E+10 (I)                                                     | 5E+07 (C,I)                                          | 16,000 (I)                                                         | 1.20E+10 (I)                                                         | 1.60E+8 (C,I)                                        | 3,700                            | 11,000                                                                      | <10 U       | --                  | NM          | --                  | 31          | --                  | NM          | --         | 440        | --           | NM         | --      | NM     | --      | 79     | --      | NM     | --      | NM     | -- | <10 U | -- |
| XYLENE - TOTAL                     | 1330-20-7  | 980 (I)                                                                    | 5,600 (I)                                                         | 6.30E+6 (I)                                                                                       | 2.90E+11 (I)                                                     | 4.1E+08 (C,I)                                        | 5,600 (I)                                                          | 1.30E+11 (I)                                                         | 1.00E+9 (C,D,I)                                      | 280 (J)                          | 830 (J)                                                                     | <30 U       | --                  | NM          | --                  | 460         | [18]                | NM          | --         | 2,300      | [2,18,19]    | NM         | --      | NM     | --      | 950    | [18,19] | NM     | --      | NM     | -- | <30 U | -- |
| Organics - Pesticides (ug/kg)      |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |             |                     |             |                     |             |                     |             |            |            |              |            |         |        |         |        |         |        |         |        |    |       |    |
| 4,4-DDE                            | 72-55-9    | NLL                                                                        | NLL                                                               | NLV                                                                                               | 3.20E+07                                                         | 45,000                                               | NLL                                                                | 4.00E+07                                                             | 1.90E+05                                             | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --         | NM         | --           | NM         | --      | NM     | --      | NM     | --      | NM     | --      | NM     | -- | NM    | -- |
| 4,4-DDT                            | 50-29-3    | NLL                                                                        | NLL                                                               | NLV                                                                                               | 3.20E+07                                                         | 57,000                                               | NLL                                                                | 4.00E+07                                                             | 2.80E+05                                             | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --         | NM         | --           | NM         | --      | NM     | --      | NM     | --      | NM     | --      | NM     | -- | NM    | -- |
| ALDRIN                             | 309-00-2   | NLL                                                                        | NLL                                                               | 1.30E+06                                                                                          | 6.40E+05                                                         | 1,000                                                | NLL                                                                | 8.00E+05                                                             | 4,300                                                | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --         | NM         | --           | NM         | --      | NM     | --      | NM     | --      | NM     | --      | NM     | -- | NM    | -- |
| ALPHA-CHLORDANE                    | 5103-71-9  | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --         | NM         | --           | NM         | --      | NM     | --      | NM     | --      | NM     | --      | NM     | -- | NM    | -- |
| BETA-BHC                           | 319-85-7   | ID                                                                         | 37                                                                | NLV                                                                                               | 5.90E+06                                                         | 5,400                                                | 150                                                                | 7.40E+06                                                             | 25,000                                               | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --         | NM         | --           | NM         | --      | NM     | --      | NM     | --      | NM     | --      | NM     | -- | NM    | -- |
| ENDOSULFAN I                       | 959-98-8   | NLL                                                                        | NLL                                                               | ID                                                                                                | ID                                                               | 1.4E+06 (J)                                          | NLL                                                                | ID                                                                   | 4.40E+06 (J)                                         | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --         | NM         | --           | NM         | --      | NM     | --      | NM     | --      | NM     | --      | NM     | -- | NM    | -- |
| ENDRIN KETONE                      | 53494-70-5 | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --         | NM         | --           | NM         | --      | NM     | --      | NM     | --      | NM     | --      | NM     | -- | NM    | -- |
| GAMMA-CHLORDANE                    | 5103-74-2  | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --         | NM         | --           | NM         | --      | NM     | --      | NM     | --      | NM     | --      | NM     | -- | NM    | -- |
| HEPTACHLOR                         | 76-44-8    | NLL                                                                        | NLL                                                               | 3.50E+05                                                                                          | 2.40E+06                                                         | 5,600                                                | NLL                                                                | 3.00E+06                                                             | 23,000                                               | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --         | NM         | --           | NM         | --      | NM     | --      | NM     | --      | NM     | --      | NM     | -- | NM    | -- |
| Other                              |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |             |                     |             |                     |             |                     |             |            |            |              |            |         |        |         |        |         |        |         |        |    |       |    |
| CHLORIDE (mg/kg)                   | --         | 94 (X)                                                                     | 5,000                                                             | NLV                                                                                               | ID                                                               | 500 (F)                                              | 5,000                                                              | ID                                                                   | 500 (F)                                              | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --         | NM         | --           | NM         | --      | NM     | --      | NM     | --      | NM     | --      | NM     | -- | NM    | -- |
| PERCENT MOISTURE (%)               | --         | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --         | NM         | --           | NM         | --      | NM     | --      | NM     | --      | NM     | --      | NM     | -- | NM    | -- |
| HYDROCARBONS, TOTAL (mg/kg)        | --         | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM          | --                  | NM          | --                  | NM          | --                  | NM          | --         | NM         | --           | NM         | --      | NM     | --      | NM     | --      | NM     | --      | NM     | -- | NM    | -- |

Note: Analytical and Criteria Footnotes are included on the last page of the table

TABLE 6-1  
Summary of Soil Analytical Results  
Area B  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code                |            | EGLE Part 201 Generic Cleanup Criteria                                     |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |            | Area B  |            |         |            |         |                                                                                                           |          |                                            |          |                                                                     |          |                                                                                 |          |                                                                                          |             |                                                                                                              |          |                                                  |         |                                                  |         |                                                  |         |        |
|------------------------------|------------|----------------------------------------------------------------------------|-------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------------------|----------------------------------------------------------------------|------------------------------------------------------|----------------------------------|-----------------------------------------------------------------------------|------------|---------|------------|---------|------------|---------|-----------------------------------------------------------------------------------------------------------|----------|--------------------------------------------|----------|---------------------------------------------------------------------|----------|---------------------------------------------------------------------------------|----------|------------------------------------------------------------------------------------------|-------------|--------------------------------------------------------------------------------------------------------------|----------|--------------------------------------------------|---------|--------------------------------------------------|---------|--------------------------------------------------|---------|--------|
| Station Name                 | CAS Number | [2]<br>Groundwater<br>Surface Water<br>Interface<br>Protection<br>Criteria | [4]<br>Residential<br>Drinking<br>Water<br>Protection<br>Criteria | [5]<br>Residential<br>Soil<br>Volatilization<br>to Indoor Air<br>Inhalation<br>Criteria<br>(VSIC) | [9]<br>Residential<br>Particulate<br>Soil Inhalation<br>Criteria | [10]<br>Residential<br>Direct<br>Contact<br>Criteria | [11]<br>Nonresidential<br>Drinking Water<br>Protection<br>Criteria | [16]<br>Nonresidential<br>Particulate<br>Soil Inhalation<br>Criteria | [17]<br>Nonresidential<br>Direct Contact<br>Criteria | [18]<br>Soil Residential<br>MSSL | [19]<br>Soil<br>Nonresidential<br>MSSL                                      | T2-S       |         | T3-N       |         | T3-S       |         | SS-5                                                                                                      |          | SS-6                                       |          | SS-7                                                                |          | SS-8                                                                            |          | SS-9                                                                                     |             | SS-32                                                                                                        |          | QMCP-SB07                                        |         | QMCP-SB67                                        |         | QMCP-SB68                                        |         |        |
| Field Sample ID              |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | T2-S 10146 |         | T3-N 10147 |         | T3-S 10148 |         | SS 5                                                                                                      |          | SS 6                                       |          | SS 7                                                                |          | SS 8                                                                            |          | SS 9                                                                                     |             | SS 32                                                                                                        |          | QMCP-SB7 0-3                                     |         | QMCP-SB67 0-3                                    |         | QMCP-SB68 0-3                                    |         |        |
| Sample Date                  |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | 7/8/1998   |         | 7/8/1998   |         | 7/8/1998   |         | 6/5/2002                                                                                                  |          | 6/5/2002                                   |          | 6/5/2002                                                            |          | 6/5/2002                                                                        |          | 6/5/2002                                                                                 |             | 6/5/2002                                                                                                     |          | 9/11/2018                                        |         | 9/11/2018                                        |         | 9/11/2018                                        |         |        |
| Sample Interval (bgs)        |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | --         |         | --         |         | --         |         | 0 - 3 in<br>0 - 12 in                                                                                     |          | 0 - 6 in<br>0 - 12 in                      |          | 0 - 6 in<br>0 - 12 in                                               |          | 0 - 6 in<br>0 - 12 in                                                           |          | 0 - 6 in<br>0 - 12 in                                                                    |             | 0 - 4 in<br>0 - 12 in                                                                                        |          | 0 - 3 ft                                         |         | 0 - 3 ft                                         |         | 0 - 3 ft                                         |         |        |
| Sample Description           |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | --         |         | --         |         | --         |         | 0-3"- Moist, dark brown, medium to fine sand with some stamp sand on surface along with some fine gravel. |          | 0-6" - Reddish-brown, fine to medium sand. |          | 0-6" - Slightly moist, fine to medium sand with some coal and wood. |          | 0-6" - Slightly moist, dark brown, fine to medium sand with some coal and wood. |          | 0-6" - Slightly moist, dark brown to black, fine to medium sand with some coarse gravel. |             | 0-4" - Dry, dark brown, medium sand, with 50-70% black stamp sand. Sample was sieved through #30 size sieve. |          | SAND, Fine to medium, brown, saturated at 3 feet |         | SAND, Fine to medium, brown, saturated at 3 feet |         | SAND, Fine to medium, brown, saturated at 3 feet |         |        |
|                              |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | Result     | Exceeds | Result     | Exceeds | Result     | Exceeds | Result                                                                                                    | Exceeds  | Result                                     | Exceeds  | Result                                                              | Exceeds  | Result                                                                          | Exceeds  | Result                                                                                   | Exceeds     | Result                                                                                                       | Exceeds  | Result                                           | Exceeds | Result                                           | Exceeds | Result                                           | Exceeds | Result |
| Inorganics - Metals (mg/kg)  |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |            |         |            |         |            |         |                                                                                                           |          |                                            |          |                                                                     |          |                                                                                 |          |                                                                                          |             |                                                                                                              |          |                                                  |         |                                                  |         |                                                  |         |        |
| ALUMINIUM                    | 7429-90-5  | NA                                                                         | 6900 (B)                                                          | NLV                                                                                               | ID                                                               | 50,000 (D,BB)                                        | 6,900 (B)                                                          | ID                                                                   | 3.7E+5 (D,BB)                                        | NA                               | NA                                                                          | NM         | --      | NM         | --      | NM         | --      | 6,110                                                                                                     | --       | 9,970                                      | [4,11]   | 6,260                                                               | --       | 9,470                                                                           | [4,11]   | 9,740                                                                                    | [4,11]      | 15,400                                                                                                       | [4,11]   | NM                                               | --      | NM                                               | --      | NM                                               | --      |        |
| ANTIMONY                     | 7440-36-0  | 1.2 (X)                                                                    | 4.3                                                               | NLV                                                                                               | 13,000                                                           | 180                                                  | 4.3                                                                | 5,900                                                                | 670                                                  | NA                               | NA                                                                          | NM         | --      | NM         | --      | NM         | --      | <0.81 UJ                                                                                                  | --       | 0.92 J                                     | --       | <0.8 UJ                                                             | --       | 0.84 J                                                                          | --       | 1.9 J                                                                                    | [2]         | <0.78 UJ                                                                                                     | --       | NM                                               | --      | NM                                               | --      | NM                                               | --      |        |
| ARSENIC                      | 7440-38-2  | 4.6                                                                        | 4.6                                                               | NLV                                                                                               | 720                                                              | 7.6                                                  | 4.6                                                                | 910                                                                  | 37                                                   | NA                               | NA                                                                          | NM         | --      | NM         | --      | NM         | --      | 3.6                                                                                                       | --       | 2.3                                        | --       | 5.7                                                                 | [2,4,11] | 5.2                                                                             | [2,4,11] | 9.4                                                                                      | [2,4,10,11] | 3.7                                                                                                          | --       | NM                                               | --      | NM                                               | --      | NM                                               | --      |        |
| BARIUM                       | 7440-39-3  | 130 (B,G)                                                                  | 1,300 (B)                                                         | NLV                                                                                               | 3.3E+5 (B)                                                       | 37,000 (B)                                           | 1,300 (B)                                                          | 1.5E+5 (B)                                                           | 1.3E+5 (B)                                           | NA                               | NA                                                                          | NM         | --      | NM         | --      | NM         | --      | 28.7                                                                                                      | --       | 24.7                                       | --       | 54.4                                                                | --       | 60.6                                                                            | --       | 40.6                                                                                     | --          | 7                                                                                                            | --       | NM                                               | --      | NM                                               | --      | NM                                               | --      |        |
| BERYLLIUM                    | 7440-41-7  | 24 (G)                                                                     | 51                                                                | NLV                                                                                               | 1,300                                                            | 410                                                  | 51                                                                 | 590                                                                  | 1,600                                                | NA                               | NA                                                                          | NM         | --      | NM         | --      | NM         | --      | <0.06 U                                                                                                   | --       | <0.06 U                                    | --       | 0.14                                                                | --       | <0.06 U                                                                         | --       | 0.22                                                                                     | --          | 0.08                                                                                                         | --       | NM                                               | --      | NM                                               | --      | NM                                               | --      |        |
| CADMIUM                      | 7440-43-9  | 1.6 (B,G,X)                                                                | 6.0 (B)                                                           | NLV                                                                                               | 1,700 (B)                                                        | 550 (B)                                              | 6.0 (B)                                                            | 2,200 (B)                                                            | 2,100 (B)                                            | NA                               | NA                                                                          | NM         | --      | NM         | --      | NM         | --      | <0.11 U                                                                                                   | --       | <0.11 U                                    | --       | <0.1 U                                                              | --       | <0.11 U                                                                         | --       | <0.11 U                                                                                  | --          | <0.1 U                                                                                                       | --       | <0.2 U                                           | --      | <0.2 U                                           | --      | 0.7                                              | --      |        |
| CALCIUM                      | 7440-70-2  | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM         | --      | NM         | --      | NM         | --      | 6,430 J                                                                                                   | --       | 14,900 J                                   | --       | 17,400 J                                                            | --       | 13,500 J                                                                        | --       | 55,600 J                                                                                 | --          | 24,500                                                                                                       | --       | NM                                               | --      | NM                                               | --      | NM                                               | --      |        |
| CHROMIUM                     | 7440-47-3  | 1.2E+6 (B,G,H,X)                                                           | 1.0E+6 (B,D,H)                                                    | NLV                                                                                               | 3.30E+8 (B,H)                                                    | 7.90E+5 (B,H)                                        | 1.00E+6 (B,D,H)                                                    | 1.50E+5 (B,H)                                                        | 1.00E+6 (B,D,H)                                      | NA                               | NA                                                                          | NM         | --      | NM         | --      | NM         | --      | 13.8                                                                                                      | --       | 25.9                                       | --       | 15                                                                  | --       | 28.1                                                                            | --       | 20.4                                                                                     | --          | 34.6                                                                                                         | --       | 10                                               | --      | 13                                               | --      | 63                                               | --      |        |
| COBALT                       | 7440-48-4  | 2                                                                          | 0.8                                                               | NLV                                                                                               | 13,000                                                           | 2,600                                                | 2                                                                  | 5,900                                                                | 9,000                                                | NA                               | NA                                                                          | NM         | --      | NM         | --      | NM         | --      | 10.6                                                                                                      | [2,4,11] | 21.1                                       | [2,4,11] | 8.3                                                                 | [2,4,11] | 14.7                                                                            | [2,4,11] | 13.5                                                                                     | [2,4,11]    | 22.8                                                                                                         | [2,4,11] | NM                                               | --      | NM                                               | --      | NM                                               | --      |        |
| COPPER                       | 7440-50-8  | 32 (B,G)                                                                   | 5,800 (B)                                                         | NLV                                                                                               | 130,000 (B)                                                      | 20,000 (B)                                           | 5,800 (B)                                                          | 59,000 (B)                                                           | 73,000 (B)                                           | NA                               | NA                                                                          | NM         | --      | NM         | --      | NM         | --      | 1,340                                                                                                     | [2]      | 2,260 J                                    | [2]      | 1,750                                                               | [2]      | 1,230                                                                           | [2]      | 2,270 J                                                                                  | [2]         | 1,440 J                                                                                                      | [2]      | NM                                               | --      | NM                                               | --      | NM                                               | --      |        |
| IRON                         | 7439-89-6  | --                                                                         | 12,000 (B)                                                        | NLV                                                                                               | ID                                                               | 160,000 (B)                                          | 12,000 (B)                                                         | ID                                                                   | 580,000 (B)                                          | NA                               | NA                                                                          | NM         | --      | NM         | --      | NM         | --      | 10,600                                                                                                    | --       | 16,700                                     | [4,11]   | 13,800                                                              | [4,11]   | 24,600                                                                          | [4,11]   | 25,500                                                                                   | [4,11]      | 16,100                                                                                                       | [4,11]   | NM                                               | --      | NM                                               | --      | NM                                               | --      |        |
| LEAD                         | 7439-92-1  | 2,500 (B,G,X)                                                              | 700 (B)                                                           | NLV                                                                                               | 100,000 (B)                                                      | 400 (B)                                              | 700 (B)                                                            | 44,000 (B)                                                           | 900 (B,DD)                                           | NA                               | NA                                                                          | NM         | --      | NM         | --      | NM         | --      | 18.3 J                                                                                                    | --       | 29 J                                       | --       | 30.1 J                                                              | --       | 34.4 J                                                                          | --       | 113 J                                                                                    | --          | 1.4 J                                                                                                        | --       | 5.4                                              | --      | 31                                               | --      | 63                                               | --      |        |
| LITHIUM                      | 7439-93-2  | 9.8 (B)                                                                    | 9.8 (B)                                                           | NLV                                                                                               | 2.30E+9 (B)                                                      | 4,200 (B,DD)                                         | 9.8 (B)                                                            | 1.00E+6 (B)                                                          | 31,000 (B,DD)                                        | NA                               | NA                                                                          | NM         | --      | NM         | --      | NM         | --      | NM                                                                                                        | --       | NM                                         | --       | NM                                                                  | --       | NM                                                                              | --       | NM                                                                                       | --          | NM                                                                                                           | --       | NM                                               | --      | NM                                               | --      | NM                                               | --      |        |
| MAGNESIUM                    | 7439-95-4  | --                                                                         | 8,000 (B)                                                         | NLV                                                                                               | 6.70E+6 (B)                                                      | 1.0E+9 (B,D)                                         | 22,000 (B)                                                         | 2.90E+6 (B)                                                          | 1.00E+6 (B,D)                                        | NA                               | NA                                                                          | NM         | --      | NM         | --      | NM         | --      | 5,540                                                                                                     | --       | 9,930                                      | [4]      | 5,430                                                               | --       | 8,430                                                                           | [4]      | 8,980                                                                                    | [4]         | 17,100                                                                                                       | [4]      | NM                                               | --      | NM                                               | --      | NM                                               | --      |        |
| MANGANESE                    | 7439-96-5  | 440 (B,G,X)                                                                | 440 (B)                                                           | NLV                                                                                               | 3,300 (B)                                                        | 25,000 (B)                                           | 440 (B)                                                            | 1,500 (B)                                                            | 90,000 (B)                                           | NA                               | NA                                                                          | NM         | --      | NM         | --      | NM         | --      | 243                                                                                                       | --       | 460                                        | [2,4,11] | 206                                                                 | --       | 551                                                                             | [2,4,11] | 468                                                                                      | [2,4,11]    | 465                                                                                                          | [2,4,11] | NM                                               | --      | NM                                               | --      | NM                                               | --      |        |
| MERCURY                      | 7439-97-6  | 0.13 (B,Z)                                                                 | 1.7 (B,Z)                                                         | 48 (B,Z)                                                                                          | 20,000 (B,Z)                                                     | 160 (B,Z)                                            | 1.7 (B,Z)                                                          | 8,800 (B,Z)                                                          | 580 (B,Z)                                            | 0.022 (M)                        | 0.066                                                                       | NM         | --      | NM         | --      | NM         | --      | <0.05 U                                                                                                   | --       | 0.07                                       | [18,19]  | <0.05 U                                                             | --       | 0.07                                                                            | [18,19]  | 0.08                                                                                     | [18,19]     | <0.05 UJ                                                                                                     | --       | NM                                               | --      | NM                                               | --      | NM                                               | --      |        |
| NICKEL                       | 7440-02-0  | 29 (G)                                                                     | 100 (B)                                                           | NLV                                                                                               | 13,000 (B)                                                       | 40,000 (B)                                           | 100 (B)                                                            | 16,000 (B)                                                           | 1.50E+5 (B)                                          | NA                               | NA                                                                          | NM         | --      | NM         | --      | NM         | --      | 14.5                                                                                                      | --       | 19.1                                       | --       | 14.9                                                                | --       | 20.9                                                                            | --       | 23.8                                                                                     | --          | 39.8                                                                                                         | [2]      | NM                                               | --      | NM                                               | --      | NM                                               | --      |        |
| POTASSIUM                    | 7440-09-7  | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM         | --      | NM         | --      | NM         | --      | 379 J                                                                                                     | --       | 325 J                                      | --       | 676 J                                                               | --       | 457 J                                                                           | --       | 409 J                                                                                    | --          | 214 J                                                                                                        | --       | NM                                               | --      | NM                                               | --      | NM                                               | --      |        |
| SELENIUM                     | 7782-49-2  | 0.41 (B)                                                                   | 4.0 (B)                                                           | NLV                                                                                               | 130,000 (B)                                                      | 2,600 (B)                                            | 4.0 (B)                                                            | 59,000 (B)                                                           | 9,600 (B)                                            | NA                               | NA                                                                          | NM         | --      | NM         | --      | NM         | --      | <0.47 U                                                                                                   | --       | <0.46 U                                    | --       | <0.46 U                                                             | --       | <0.47 U                                                                         | --       | 0.55                                                                                     | [2]         | 0.68 J                                                                                                       | [2]      | NM                                               | --      | NM                                               | --      | NM                                               | --      |        |
| SILVER                       | 7440-22-4  | 1.0 (B,M)                                                                  | 4.5 (B)                                                           | NLV                                                                                               | 6700 (B)                                                         | 2500 (B)                                             | 13 (B)                                                             | 2,900 (B)                                                            | 9,000 (B)                                            | NA                               | NA                                                                          | NM         | --      | NM         | --      | NM         | --      | <0.24 U                                                                                                   | --       | 0.5                                        | --       | 0.63                                                                | --       | 0.44 J                                                                          | --       | 0.99 J                                                                                   | --          | <0.22 U                                                                                                      | --       | NM                                               | --      | NM                                               | --      | NM                                               | --      |        |
| SODIUM                       | 7440-23-5  | NA                                                                         | 4,600                                                             | NLV                                                                                               | ID                                                               | 1.0E+6 (D)                                           | NA                                                                 | ID                                                                   | 1.0E+6 (D)                                           | NA                               | NA                                                                          | NM         | --      | NM         | --      | NM         | --      | 541 J                                                                                                     | --       | 684 J                                      | --       | 657 J                                                               | --       | 938 J                                                                           | --       | 995 J                                                                                    | --          | 2,500 J                                                                                                      | --       | NM                                               | --      | NM                                               | --      | NM                                               | --      |        |
| VANADIUM                     | 7440-62-2  | 430                                                                        | 72                                                                | NLV                                                                                               | ID                                                               | 750 (DD)                                             | 990                                                                | ID                                                                   | 5,500 (DD)                                           | NA                               | NA                                                                          | NM         | --      | NM         | --      | NM         | --      | 30                                                                                                        | --       | 47                                         | --       | 26.2                                                                | --       | 41.8                                                                            | --       | 35.2                                                                                     | --          | 51                                                                                                           | --       | NM                                               | --      | NM                                               | --      | NM                                               | --      |        |
| ZINC                         | 7440-66-6  | 62 (B,G)                                                                   | 2,400 (B)                                                         | NLV                                                                                               | ID                                                               | 1.70E+5 (B)                                          | 5,000 (B)                                                          | ID                                                                   | 6.30E+5 (B)                                          | NA                               | NA                                                                          | NM         | --      | NM         | --      | NM         | --      | 57.3                                                                                                      | --       | 62                                         | --       | 47.3                                                                | --       | 57.6                                                                            | --       | 95.1                                                                                     | [2]         | 56.2 J                                                                                                       | --       | NM                                               | --      | NM                                               | --      | NM                                               | --      |        |
| Inorganics - Cyanide (mg/kg) |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |            |         |            |         |            |         |                                                                                                           |          |                                            |          |                                                                     |          |                                                                                 |          |                                                                                          |             |                                                                                                              |          |                                                  |         |                                                  |         |                                                  |         |        |
| CYANIDE                      | 57-12-5    | 0.1 (P,R)                                                                  | 4.0 (P,R)                                                         | NLV                                                                                               | 250 (P,R)                                                        | 12 (P,R)                                             | 4.0 (P,R)                                                          | 250 (P,R)                                                            | 250 (P,R)                                            | NA                               | NA                                                                          | NM         | --      | NM         | --      | NM         | --      | 0.08 J                                                                                                    | --       | <0.04 UJ                                   | --       | <0.04 UJ                                                            | --       | <0.1 UJ                                                                         | --       | 0.57 J                                                                                   | [2]         | 0.27 J                                                                                                       | [2]      | NM                                               | --      | NM                                               | --      | NM                                               | --      |        |
| Organics - PCBs (ug/kg)      |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |            |         |            |         |            |         |                                                                                                           |          |                                            |          |                                                                     |          |                                                                                 |          |                                                                                          |             |                                                                                                              |          |                                                  |         |                                                  |         |                                                  |         |        |
| AROCLOR-1260                 | 11096-82-5 | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM         | --      | NM         | --      | NM         | --      | <34 U                                                                                                     | --       | <35 U                                      | --       | <34 U                                                               | --       | <35 U                                                                           | --       | <77 U                                                                                    | --          | <34 U                                                                                                        | --       | NM                                               | --      | NM                                               | --      | NM                                               | --      |        |
| AROCLOR-1262                 | 37324-23-5 | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM         | --      | NM         | --      | NM         | --      | NM                                                                                                        | --       | NM                                         | --       | NM                                                                  | --       | NM                                                                              | --       | NM                                                                                       | --          | NM                                                                                                           | --       | NM                                               | --      | NM                                               | --      | NM                                               | --      |        |
| TOTAL PCBs                   | 1336-36-6  | NLL                                                                        | NLL                                                               | 3.00E+6 (J,T)                                                                                     | 5.20E+6 (J,T)                                                    | 1,000 (J,T)                                          | NLL                                                                | 6.50E+6 (J,T)                                                        | 1,000 (J,T)                                          | NA                               | NA                                                                          | NM         | --      | NM         | --      | NM         | --      | ND                                                                                                        | --       | ND                                         | --       | ND                                                                  | --       | ND                                                                              | --       | ND                                                                                       | --          | ND                                                                                                           | --       | NM                                               | --      | NM                                               | --      | NM                                               | --      |        |
| Organics - SVOCs (ug/kg)     |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |            |         |            |         |            |         |                                                                                                           |          |                                            |          |                                                                     |          |                                                                                 |          |                                                                                          |             |                                                                                                              |          |                                                  |         |                                                  |         |                                                  |         |        |
| 1,1-BIPHENYL                 | 92-52-4    | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM         | --      | NM         | --      | NM         | --      | <1700 U                                                                                                   | --       | <1800 U                                    | --       | <680 U                                                              | --       | <1700 U                                                                         | --       | <1900 U                                                                                  | --          | <340 U                                                                                                       | --       | NM                                               | --      | NM                                               | --      | NM                                               | --      |        |
| 2-METHYLNAPHTHALENE (SVOC)   | 91-57-6S   | 4,200                                                                      | 57,000                                                            | 2.70E+06                                                                                          | 6.70E+08                                                         | 8.10E+06                                             | 1.70E+05                                                           | 2.90E+08                                                             | 2.60E+07                                             | NA                               | NA                                                                          | NM         | --      | <330 U     | --      | <330 U     | --      | <1700 U                                                                                                   | --       | 240 J                                      | --       | 380 J                                                               | --       | <1700 U                                                                         | --       | 450 J                                                                                    | --          | <340 U                                                                                                       | --       | <600 U                                           | --      | 700                                              | --      | 990                                              | --      |        |
| ACENAPHTHENE                 | 83-32-9    | 8,700                                                                      | 3.00E+05                                                          | 1.90E+08                                                                                          | 1.40E+10                                                         | 4.10E+07                                             | 8.80E+05                                                           | 6.20E+09                                                             | 1.30E+08                                             | NA                               | NA                                                                          | NM         | --      | <330 U     | --      | <330 U     | --      | <1700 U                                                                                                   | --       | <1800 U                                    | --       | <680 U                                                              | --       | <1700 U                                                                         | --       | <1900 U                                                                                  | --          | <340 U                                                                                                       | --       | <240 U                                           | --      | <230 U                                           | --      | <260 U                                           | --      |        |
| ACENAPHTHYLENE               | 208-96-8   | ID                                                                         | 5,900                                                             | 1.60E+06                                                                                          | 2.30E+09                                                         | 1.60E+06                                             | 17,000                                                             | 1.00E+09                                                             | 5.20E+06                                             | NA                               | NA                                                                          | NM         | --      | <330 U     | --      | <330 U     | --      | <1700 U                                                                                                   | --       | <1800 U                                    | --       | <680 U                                                              | --       | <1700 U                                                                         | --       | <1900 U                                                                                  | --          | <340 U                                                                                                       | --       | <240 U                                           | --      | <230 U                                           | --      | <260 U                                           | --      |        |
| ACETOPHENONE                 | 98-86-2    | ID                                                                         | 30,000                                                            | 1.20E+8 (C)                                                                                       | 3.30E+10                                                         | 4.70E+7 (C)                                          | 88,000                                                             | 1.40E+10                                                             | 1.50E+8 (C)                                          | NA                               | NA                                                                          | NM         | --      | NM         | --      | NM         | --      | <1700 U                                                                                                   | --       | <1800 U                                    | --       | <680 U                                                              | --       | <1700 U                                                                         | --       | <1900 U                                                                                  | --          | <340 U                                                                                                       | --       | NM                                               | --      | NM                                               | --      | NM                                               | --      |        |
| ANTHRACENE                   | 120-12-7   | ID                                                                         | 41,000                                                            | 1.00E+9 (D)                                                                                       | 6.70E+10                                                         | 2.30E+08                                             | 41,000                                                             | 2.90E+10                                                             | 7.30E+08                                             | NA                               | NA                                                                          | NM         | --      | <330 U     | --      | <330 U     | --      | <1700 U                                                                                                   | --       | <1800 U                                    | --       | <680 U                                                              | --       | <1700 U                                                                         | --       | <1900 U                                                                                  | --          | <340 U                                                                                                       | --</     |                                                  |         |                                                  |         |                                                  |         |        |

**TABLE 6-1**  
**Summary of Soil Analytical Results**  
**Area B**  
**Quincy Mining Company Portage Operations Area**  
**Abandoned Mining Wastes - Torch Lake Non-Superfund Site**

| Location Code                      |            | EGLE Part 201 Generic Cleanup Criteria                         |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                                                                                            | Area B  |                                            |         |                                                                     |         |                                                                                 |         |                                                                                          |         |                                                                                                              |           |                                                  |         |                                                  |         |                                                  |         |              |         |               |         |               |         |
|------------------------------------|------------|----------------------------------------------------------------|-------------------------------------------------------|---------------------------------------------------------------------------------|---------------------------------------------------------|---------------------------------------------|-----------------------------------------------------------|-------------------------------------------------------------|------------------------------------------------|-------------------------------|-----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|---------|--------------------------------------------|---------|---------------------------------------------------------------------|---------|---------------------------------------------------------------------------------|---------|------------------------------------------------------------------------------------------|---------|--------------------------------------------------------------------------------------------------------------|-----------|--------------------------------------------------|---------|--------------------------------------------------|---------|--------------------------------------------------|---------|--------------|---------|---------------|---------|---------------|---------|
| Station Name                       | CAS Number | [2]<br>Groundwater Surface Water Interface Protection Criteria | [4]<br>Residential Drinking Water Protection Criteria | [5]<br>Residential Soil Volatilization to Indoor Air Inhalation Criteria (VSIC) | [9]<br>Residential Particulate Soil Inhalation Criteria | [10]<br>Residential Direct Contact Criteria | [11]<br>Nonresidential Drinking Water Protection Criteria | [16]<br>Nonresidential Particulate Soil Inhalation Criteria | [17]<br>Nonresidential Direct Contact Criteria | [18]<br>Soil Residential MSSL | [19]<br>Soil Nonresidential MSSL                                            | T2-S                                                                                                       |         | T3-N                                       |         | T3-S                                                                |         | SS-5                                                                            |         | SS-6                                                                                     |         | SS-7                                                                                                         |           | SS-8                                             |         | SS-9                                             |         | SS-32                                            |         | QMCP-SB07    |         | QMCP-SB67     |         | QMCP-SB68     |         |
| Field Sample ID                    |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             | T2-S 10146                                                                                                 |         | T3-N 10147                                 |         | T3-S 10148                                                          |         | SS 5                                                                            |         | SS 6                                                                                     |         | SS 7                                                                                                         |           | SS 8                                             |         | SS 9                                             |         | SS 32                                            |         | QMCP-SB7 0-3 |         | QMCP-SB67 0-3 |         | QMCP-SB68 0-3 |         |
| Sample Date                        |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             | 7/8/1998                                                                                                   |         | 7/8/1998                                   |         | 7/8/1998                                                            |         | 6/5/2002                                                                        |         | 6/5/2002                                                                                 |         | 6/5/2002                                                                                                     |           | 6/5/2002                                         |         | 6/5/2002                                         |         | 6/5/2002                                         |         | 9/11/2018    |         | 9/11/2018     |         | 9/11/2018     |         |
| Sample Interval (bgs)              |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             | 0 - 3 in<br>0 - 12 in                                                                                      |         | 0 - 3 in<br>0 - 12 in                      |         | 0 - 3 in<br>0 - 12 in                                               |         | 0 - 6 in<br>0 - 12 in                                                           |         | 0 - 6 in<br>0 - 12 in                                                                    |         | 0 - 6 in<br>0 - 12 in                                                                                        |           | 0 - 6 in<br>0 - 12 in                            |         | 0 - 6 in<br>0 - 12 in                            |         | 0 - 4 in<br>0 - 12 in                            |         | 0 - 3 ft     |         | 0 - 3 ft      |         | 0 - 3 ft      |         |
| Sample Description                 |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             | 0-3" - Moist, dark brown, medium to fine sand with some stamp sand on surface along with some fine gravel. |         | 0-6" - Reddish-brown, fine to medium sand. |         | 0-6" - Slightly moist, fine to medium sand with some coal and wood. |         | 0-6" - Slightly moist, dark brown, fine to medium sand with some coal and wood. |         | 0-6" - Slightly moist, dark brown to black, fine to medium sand with some coarse gravel. |         | 0-4" - Dry, dark brown, medium sand, with 50-70% black stamp sand. Sample was sieved through #30 size sieve. |           | SAND, Fine to medium, brown, saturated at 3 feet |         | SAND, Fine to medium, brown, saturated at 3 feet |         | SAND, Fine to medium, brown, saturated at 3 feet |         |              |         |               |         |               |         |
|                                    |            | Result                                                         | Exceeds                                               | Result                                                                          | Exceeds                                                 | Result                                      | Exceeds                                                   | Result                                                      | Exceeds                                        | Result                        | Exceeds                                                                     | Result                                                                                                     | Exceeds | Result                                     | Exceeds | Result                                                              | Exceeds | Result                                                                          | Exceeds | Result                                                                                   | Exceeds | Result                                                                                                       | Exceeds   | Result                                           | Exceeds | Result                                           | Exceeds | Result                                           | Exceeds | Result       | Exceeds | Result        | Exceeds |               |         |
| Organics - SVOCs (ug/kg) Continued |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             |                                                                                                            |         |                                            |         |                                                                     |         |                                                                                 |         |                                                                                          |         |                                                                                                              |           |                                                  |         |                                                  |         |                                                  |         |              |         |               |         |               |         |
| DIBENZO(A,H)ANTHRACENE             | 53-70-3    | NLL                                                            | NLL                                                   | NLV                                                                             | ID                                                      | 2,000 (Q)                                   | NLL                                                       | ID                                                          | 8,000 (Q)                                      | NA                            | NA                                                                          | NM                                                                                                         | --      | <330 U                                     | --      | <330 U                                                              | --      | <1700 U                                                                         | --      | <1800 U                                                                                  | --      | <680 U                                                                                                       | --        | <1700 U                                          | --      | <1900 U                                          | --      | <340 U                                           | --      | <480 U       | --      | <460 U        | --      | <520 U        | --      |
| DIBENZOFURAN                       | 132-64-9   | 1,700                                                          | ID                                                    | 2.00E+06                                                                        | 6.70E+06                                                | ID                                          | ID                                                        | 2.90E+06                                                    | ID                                             | NA                            | NA                                                                          | NM                                                                                                         | --      | NM                                         | --      | NM                                                                  | --      | <1700 U                                                                         | --      | <1800 U                                                                                  | --      | 97 J                                                                                                         | --        | <1700 U                                          | --      | <1900 U                                          | --      | <340 U                                           | --      | NM           | --      | NM            | --      | NM            | --      |
| FLUORANTHENE                       | 206-44-0   | 5,500                                                          | 730,000                                               | 1.00E+9 (D)                                                                     | 9.30E+09                                                | 4.60E+07                                    | 730,000                                                   | 4.10E+09                                                    | 1.30E+08                                       | NA                            | NA                                                                          | NM                                                                                                         | --      | <330 U                                     | --      | <330 U                                                              | --      | 1,500 J                                                                         | --      | <1800 U                                                                                  | --      | 170 J                                                                                                        | --        | <1700 U                                          | --      | 330 J                                            | --      | <340 U                                           | --      | 770          | --      | 1,200         | --      | 790           | --      |
| FLUORENE                           | 86-73-7    | 5,300                                                          | 390,000                                               | 5.80E+08                                                                        | 9.30E+09                                                | 2.70E+07                                    | 890,000                                                   | 4.10E+09                                                    | 8.70E+07                                       | NA                            | NA                                                                          | NM                                                                                                         | --      | <330 U                                     | --      | <330 U                                                              | --      | <1700 U                                                                         | --      | <1800 U                                                                                  | --      | <680 U                                                                                                       | --        | <1700 U                                          | --      | <1900 U                                          | --      | <340 U                                           | --      | <240 U       | --      | <230 U        | --      | <260 U        | --      |
| INDENO(1,2,3-CD)PYRENE             | 193-39-5   | NLL                                                            | NLL                                                   | NLV                                                                             | ID                                                      | 20,000 (Q)                                  | NLL                                                       | ID                                                          | 80,000 (Q)                                     | NA                            | NA                                                                          | NM                                                                                                         | --      | <330 U                                     | --      | <330 U                                                              | --      | <1700 U                                                                         | --      | <1800 U                                                                                  | --      | <680 U                                                                                                       | --        | <1700 U                                          | --      | <1900 U                                          | --      | <340 U                                           | --      | <480 U       | --      | <460 U        | --      | <520 U        | --      |
| NAPHTHALENE (SVOC)                 | 91-20-3S   | 730                                                            | 35,000                                                | 2.50E+05                                                                        | 2.00E+08                                                | 1.60E+07                                    | 1.00E+05                                                  | 8.80E+07                                                    | 5.20E+07                                       | NA                            | NA                                                                          | NM                                                                                                         | --      | <330 U                                     | --      | <330 U                                                              | --      | <1700 U                                                                         | --      | <1800 U                                                                                  | --      | 240 J                                                                                                        | --        | <1700 U                                          | --      | 270 J                                            | --      | <340 U                                           | --      | <240 U       | --      | 490           | --      | 780           | [2]     |
| PHENANTHRENE                       | 85-01-8    | 2,100                                                          | 56,000                                                | 2.80E+06                                                                        | 6.70E+06                                                | 1.60E+06                                    | 1.60E+05                                                  | 2.90E+06                                                    | 5.20E+06                                       | NA                            | NA                                                                          | NM                                                                                                         | --      | <330 U                                     | --      | <330 U                                                              | --      | 210 J                                                                           | --      | 210 J                                                                                    | --      | 260 J                                                                                                        | --        | <1700 U                                          | --      | 420 J                                            | --      | <340 U                                           | --      | 260          | --      | 590           | --      | 700           | --      |
| PYRENE                             | 129-00-0   | ID                                                             | 4.80E+05                                              | 1.00E+9 (D)                                                                     | 6.70E+09                                                | 2.90E+07                                    | 4.80E+05                                                  | 2.90E+09                                                    | 8.40E+07                                       | NA                            | NA                                                                          | NM                                                                                                         | --      | <330 U                                     | --      | 400                                                                 | --      | 1,300 J                                                                         | --      | <1800 U                                                                                  | --      | 140 J                                                                                                        | --        | <1700 U                                          | --      | 330 J                                            | --      | <340 U                                           | --      | 660          | --      | 890           | --      | 620           | --      |
| Organics - VOCs (ug/kg)            |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             |                                                                                                            |         |                                            |         |                                                                     |         |                                                                                 |         |                                                                                          |         |                                                                                                              |           |                                                  |         |                                                  |         |                                                  |         |              |         |               |         |               |         |
| 1,2,3-TRIMETHYLBENZENE             | 526-73-8   | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | 270 (JT)                      | 800 (JT)                                                                    | NM                                                                                                         | --      | NM                                         | --      | NM                                                                  | --      | NM                                                                              | --      | NM                                                                                       | --      | NM                                                                                                           | --        | NM                                               | --      | NM                                               | --      | NM                                               | --      | <69 U        | --      | <68 U         | --      | 87            | --      |
| 1,2,4-TRIMETHYLBENZENE             | 95-63-6    | 570 (I)                                                        | 2,100 (I)                                             | 4.3E+6 (C,I)                                                                    | 8.20E+10 (I)                                            | 3.2E+07 (C,I)                               | 2,100 (I)                                                 | 3.60E+10 (I)                                                | 1.00E+8 (C,I)                                  | 150 (JT)                      | 430 (JT)                                                                    | NM                                                                                                         | --      | NM                                         | --      | NM                                                                  | --      | <53 U                                                                           | --      | 280                                                                                      | [18]    | <1100 U                                                                                                      | --        | <1000 U                                          | --      | 190                                              | [18]    | <52 U                                            | --      | <69 U        | --      | 130           | --      | 230           | [18]    |
| 1,3,5-TRIMETHYLBENZENE             | 108-67-8   | 1,100 (I)                                                      | 1,800 (I)                                             | 2.6E+6 (C,I)                                                                    | 8.20E+10 (I)                                            | 3.2E+07 (C)                                 | 2,100 (I)                                                 | 3.60E+10 (I)                                                | 1.00E+8 (C,I)                                  | 100 (JT)                      | 300 (JT)                                                                    | NM                                                                                                         | --      | NM                                         | --      | NM                                                                  | --      | <53 U                                                                           | --      | 74                                                                                       | --      | <1100 U                                                                                                      | --        | <1000 U                                          | --      | <54 U                                            | --      | <52 U                                            | --      | <69 U        | --      | <68 U         | --      | <78 U         | --      |
| 2,2,4-TRIMETHYLPENTANE             | 540-84-1   | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | NM                                                                                                         | --      | NM                                         | --      | NM                                                                  | --      | NM                                                                              | --      | NM                                                                                       | --      | NM                                                                                                           | --        | NM                                               | --      | NM                                               | --      | NM                                               | --      | <340 U       | --      | <340 U        | --      | <390 U        | --      |
| 2-METHYLNAPHTHALENE (VOC)          | 91-57-6V   | 4,200                                                          | 57,000                                                | 2.70E+06                                                                        | 6.70E+08                                                | 8.10E+06                                    | 1.70E+05                                                  | 2.90E+08                                                    | 2.60E+07                                       | NA                            | NA                                                                          | NM                                                                                                         | --      | NM                                         | --      | NM                                                                  | --      | <270 U                                                                          | --      | 660                                                                                      | --      | <5300 U                                                                                                      | --        | <5200 U                                          | --      | 390                                              | --      | <260 U                                           | --      | <340 U       | --      | <340 U        | --      | <390 U        | --      |
| BENZENE                            | 71-43-2    | 240 (I,X)                                                      | 100 (I)                                               | 1,600 (I)                                                                       | 3.80E+8 (I)                                             | 1.8E+5 (I)                                  | 100 (I)                                                   | 4.70E+8 (I)                                                 | 8.40E+5 (C,I)                                  | 1.7 (M)                       | 7.9 (M)                                                                     | <10 U                                                                                                      | --      | NM                                         | --      | NM                                                                  | --      | <53 U                                                                           | --      | <52 U                                                                                    | --      | <1100 U                                                                                                      | --        | <1000 U                                          | --      | <54 U                                            | --      | <52 U                                            | --      | <69 U        | --      | <68 U         | --      | <78 U         | --      |
| CYCLOHEXANE                        | 110-82-7   | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | NM                                                                                                         | --      | NM                                         | --      | NM                                                                  | --      | NM                                                                              | --      | NM                                                                                       | --      | NM                                                                                                           | --        | NM                                               | --      | NM                                               | --      | NM                                               | --      | <340 U       | --      | <340 U        | --      | <390 U        | --      |
| ETHYLBENZENE                       | 100-41-4   | 360                                                            | 1,500                                                 | 87,000                                                                          | 1.00E+10                                                | 2.20E+07                                    | 1,500                                                     | 1.30E+10                                                    | 7.10E+07                                       | 12 (M)                        | 57                                                                          | <10 U                                                                                                      | --      | NM                                         | --      | NM                                                                  | --      | <53 U                                                                           | --      | 54                                                                                       | [18]    | <1100 U                                                                                                      | --        | <1000 U                                          | --      | <54 U                                            | --      | <52 U                                            | --      | <69 U        | --      | <68 U         | --      | 82            | [18,19] |
| HEXANE                             | 110-54-3   | NA                                                             | 1.8E+5 (C)                                            | 5.1E+5 (C)                                                                      | 1.30E+10                                                | 9.2E+7 (C)                                  | 5.10E+5 (C)                                               | 5.90E+09                                                    | 3.00E+8 (C)                                    | 25                            | 74                                                                          | NM                                                                                                         | --      | NM                                         | --      | NM                                                                  | --      | NM                                                                              | --      | NM                                                                                       | --      | NM                                                                                                           | --        | NM                                               | --      | NM                                               | --      | NM                                               | --      | <69 UJ       | --      | <68 UJ        | --      | 77 J          | [18,19] |
| ISOPROPYLBENZENE                   | 98-82-8    | 3,200                                                          | 91,000                                                | 4.00E+5 (C)                                                                     | 5.80E+09                                                | 2.50E+7 (C)                                 | 2.60E+05                                                  | 2.60E+09                                                    | 8.00E+7 (C)                                    | NA                            | NA                                                                          | NM                                                                                                         | --      | NM                                         | --      | NM                                                                  | --      | <53 U                                                                           | --      | <52 U                                                                                    | --      | <1100 U                                                                                                      | --        | <1000 U                                          | --      | <54 U                                            | --      | <52 U                                            | --      | <69 U        | --      | <68 U         | --      | <78 U         | --      |
| M,P-XYLENE                         | 1330-20-7  | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | NM                                                                                                         | --      | NM                                         | --      | NM                                                                  | --      | <110 U                                                                          | --      | 310                                                                                      | --      | <2100 U                                                                                                      | --        | <2100 U                                          | --      | 340                                              | --      | <100 U                                           | --      | <140 U       | --      | 270           | --      | 420           | --      |
| NAPHTHALENE (VOC)                  | 91-20-3V   | 730                                                            | 35,000                                                | 2.50E+05                                                                        | 2.00E+08                                                | 1.60E+07                                    | 1.00E+05                                                  | 8.80E+07                                                    | 5.20E+07                                       | NA                            | NA                                                                          | NM                                                                                                         | --      | NM                                         | --      | NM                                                                  | --      | <270 U                                                                          | --      | 480                                                                                      | --      | <5300 U                                                                                                      | --        | <5200 U                                          | --      | 320                                              | --      | <260 U                                           | --      | <340 U       | --      | <340 U        | --      | 390           | --      |
| N-PROPYLBENZENE                    | 103-65-1   | ID                                                             | 1,600 (I)                                             | ID                                                                              | 1.30E+9 (I)                                             | 2.50E+6 (I)                                 | 4,600                                                     | 5.90E+08                                                    | 8.00E+06                                       | 1,800                         | 3,500                                                                       | NM                                                                                                         | --      | NM                                         | --      | NM                                                                  | --      | <53 U                                                                           | --      | <53 U                                                                                    | --      | <1100 U                                                                                                      | --        | <1000 U                                          | --      | <54 U                                            | --      | <52 U                                            | --      | <69 U        | --      | <68 U         | --      | <78 U         | --      |
| O-XYLENE                           | 95-47-6    | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | NM                                                                                                         | --      | NM                                         | --      | NM                                                                  | --      | <53 U                                                                           | --      | 330                                                                                      | --      | 1,100                                                                                                        | --        | <1000 U                                          | --      | 230                                              | --      | <52 U                                            | --      | <69 U        | --      | 180           | --      | 330           | --      |
| P-ISOPROPYL TOLUENE (p-CYMENTHENE) | 99-87-6    | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | NM                                                                                                         | --      | NM                                         | --      | NM                                                                  | --      | <53 U                                                                           | --      | <53 U                                                                                    | --      | <1100 U                                                                                                      | --        | <1000 U                                          | --      | <54 U                                            | --      | <52 U                                            | --      | NM           | --      | NM            | --      | NM            | --      |
| SEC-BUTYLBENZENE                   | 135-98-8   | ID                                                             | 1,600                                                 | ID                                                                              | 4.00E+08                                                | 2.50E+06                                    | 4,600                                                     | 1.80E+08                                                    | 8.00E+06                                       | NA                            | NA                                                                          | NM                                                                                                         | --      | NM                                         | --      | NM                                                                  | --      | <53 U                                                                           | --      | <53 U                                                                                    | --      | <1100 U                                                                                                      | --        | <1000 U                                          | --      | <54 U                                            | --      | <52 U                                            | --      | <69 U        | --      | <68 U         | --      | <78 U         | --      |
| STYRENE                            | 100-42-5   | 530 (X)                                                        | 2,700                                                 | 2.50E+05                                                                        | 5.50E+09                                                | 4.00E+05                                    | 2,700                                                     | 6.90E+09                                                    | 1.90E+6 (C)                                    | NA                            | NA                                                                          | NM                                                                                                         | --      | NM                                         | --      | NM                                                                  | --      | <53 U                                                                           | --      | <52 U                                                                                    | --      | <1100 U                                                                                                      | --        | <1000 U                                          | --      | <54 U                                            | --      | <52 U                                            | --      | <69 U        | --      | <68 U         | --      | <78 U         | --      |
| TRACHLOROETHYLENE                  | 127-18-4   | 220 (X)                                                        | 100                                                   | 11,000                                                                          | 2.70E+09                                                | 2.0E+5 (C)                                  | 100                                                       | 1.20E+09                                                    | 9.30E+5 (C)                                    | 6.2 (M)                       | 12 (M)                                                                      | NM                                                                                                         | --      | NM                                         | --      | NM                                                                  | --      | <53 U                                                                           | --      | <52 U                                                                                    | --      | <1100 U                                                                                                      | --        | <1000 U                                          | --      | <54 U                                            | --      | <52 U                                            | --      | <69 U        | --      | <68 U         | --      | <78 U         | --      |
| TOLUENE                            | 108-88-3   | 5,400 (I)                                                      | 16,000 (I)                                            | 3.30E+5 (C,I)                                                                   | 2.70E+10 (I)                                            | 5E+07 (C,I)                                 | 16,000 (I)                                                | 1.20E+10 (I)                                                | 1.60E+8 (C,I)                                  | 3,700                         | 11,000                                                                      | <10 U                                                                                                      | --      | NM                                         | --      | NM                                                                  | --      | 64                                                                              | --      | 240                                                                                      | --      | 1,300                                                                                                        | --        | 1,300                                            | --      | 290                                              | --      | <52 U                                            | --      | <69 U        | --      | 300           | --      | 310           | --      |
| XYLENE - TOTAL                     | 1330-20-7  | 980 (I)                                                        | 5,600 (I)                                             | 6.30E+6 (I)                                                                     | 2.90E+11 (I)                                            | 4.1E+08 (C,I)                               | 5,600 (I)                                                 | 1.30E+11 (I)                                                | 1.00E+9 (C,D,I)                                | 280 (J)                       | 830 (J)                                                                     | <30 U                                                                                                      | --      | NM                                         | --      | NM                                                                  | --      | ND                                                                              | --      | 640                                                                                      | [18]    | 1,100                                                                                                        | [2,18,19] | ND                                               | --      | 570                                              | [18]    | ND                                               | --      | ND           | --      | 450           | [18]    | 750           | [18]    |
| Organics - Pesticides (ug/kg)      |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             |                                                                                                            |         |                                            |         |                                                                     |         |                                                                                 |         |                                                                                          |         |                                                                                                              |           |                                                  |         |                                                  |         |                                                  |         |              |         |               |         |               |         |
| 4,4-DDE                            | 72-55-9    | NLL                                                            | NLL                                                   | NLV                                                                             | 3.20E+07                                                | 45,000                                      | NLL                                                       | 4.00E+07                                                    | 1.90E+05                                       | NA                            | NA                                                                          | NM                                                                                                         | --      | NM                                         | --      | NM                                                                  | --      | <3.4 U                                                                          | --      | <3.5 U                                                                                   | --      | <3.4 U                                                                                                       | --        | <3.5 U                                           | --      | <7.7 U                                           | --      | <3.4 U                                           | --      | NM           | --      | NM            | --      | NM            | --      |
| 4,4-DDT                            | 50-29-3    | NLL                                                            | NLL                                                   | NLV                                                                             | 3.20E+07                                                | 57,000                                      | NLL                                                       | 4.00E+07                                                    | 2.80E+05                                       | NA                            | NA                                                                          | NM                                                                                                         | --      | NM                                         | --      | NM                                                                  | --      | <3.4 U                                                                          | --      | <3.5 U                                                                                   | --      | <3.4 U                                                                                                       | --        | <3.5 U                                           | --      | <7.7 U                                           | --      | <3.4 U                                           | --      | NM           | --      | NM            | --      | NM            | --      |
| ALDRIN                             | 309-00-2   | NLL                                                            | NLL                                                   | 1.30E+06                                                                        | 6.40E+05                                                | 1,000                                       | NLL                                                       | 8.00E+05                                                    | 4,300                                          | NA                            | NA                                                                          | NM                                                                                                         | --      | NM                                         | --      | NM                                                                  | --      | <1.8 U                                                                          | --      | <1.8 U                                                                                   | --      | <1.8 U                                                                                                       | --        | <1.8 U                                           | --      | <4 U                                             | --      | <1.8 U                                           | --      | NM           | --      | NM            | --      | NM            | --      |
| ALPHA-CHLORDANE                    | 5103-71-9  | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | NM                                                                                                         | --      | NM                                         | --      | NM                                                                  | --      | <1.8 U                                                                          | --      | 2.5                                                                                      | --      | 7.2                                                                                                          | --        | <1.8 U                                           | --      | 35                                               | --      | <1.8 U                                           | --      | NM           | --      | NM            | --      | NM            | --      |
| BETA-BHC                           | 319-85-7   | ID                                                             | 37                                                    | NLV                                                                             | 5.90E+06                                                | 5,400                                       | 150                                                       | 7.40E+06                                                    | 25,000                                         | NA                            | NA                                                                          | NM                                                                                                         | --      | NM                                         | --      | NM                                                                  | --      | <1.8 U                                                                          | --      | <1.8 U                                                                                   | --      | <1.8 U                                                                                                       | --        | <1.8 U                                           | --      | <4 U                                             | --      | <1.8 U                                           | --      | NM           | --      | NM            | --      | NM            | --      |
| ENDOSULFAN I                       | 959-98-8   | NLL                                                            | NLL                                                   | ID                                                                              | ID                                                      | 1.4E+06 (J)                                 | NLL                                                       | ID                                                          | 4.40E+06 (J)                                   | NA                            | NA                                                                          | NM                                                                                                         | --      | NM                                         | --      | NM                                                                  | --      | <1.8 U                                                                          | --      | <1.8 U                                                                                   | --      | <1.8 U                                                                                                       | --        | <1.8 U                                           | --      | <4 U                                             | --      | <1.8 U                                           | --      | NM           | --      | NM            | --      | NM            | --      |
| ENDRIN KETONE                      | 53494-70-5 | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | NM                                                                                                         | --      | NM                                         | --      | NM                                                                  | --      | 1.8 J                                                                           | --      | 1.8 J                                                                                    | --      | <1.8 U                                                                                                       | --        | <3.5 U                                           | --      | 4.7 J                                            | --      | <3.4 U                                           | --      | NM           | --      | NM            | --      | NM            | --      |
| GAMMA-CHLORDANE                    | 5103-74-2  | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | NM                                                                                                         | --      | NM                                         | --      | NM                                                                  | --      | <1.8 U                                                                          | --      | 2                                                                                        | --      | 6.9                                                                                                          | --        | <1.8 U                                           | --      | 39                                               | --      | <1.8 U                                           | --      | NM           | --      | NM            | --      | NM            | --      |
| HEPTACHLOR                         | 76-44-8    | NLL                                                            | NLL                                                   | 3.50E+05                                                                        | 2.40E+06                                                | 5,600                                       | NLL                                                       | 3.00E+06                                                    | 23,000                                         | NA                            | NA                                                                          | NM                                                                                                         | --      | NM                                         | --      | NM                                                                  | --      | <1.8 U                                                                          | --      | <1.8 U                                                                                   | --      | 2.5                                                                                                          | --        | <1.8 U                                           | --      | 20                                               | --      | <1.8 U                                           | --      | NM           | --      | NM            | --      | NM            | --      |
| Other                              |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             |                                                                                                            |         |                                            |         |                                                                     |         |                                                                                 |         |                                                                                          |         |                                                                                                              |           |                                                  |         |                                                  |         |                                                  |         |              |         |               |         |               |         |
| CHLORIDE                           |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             |                                                                                                            |         |                                            |         |                                                                     |         |                                                                                 |         |                                                                                          |         |                                                                                                              |           |                                                  |         |                                                  |         |                                                  |         |              |         |               |         |               |         |

Note: Analytical and Criteria Footnotes are included on the last page of the table.



TABLE 6-1  
Summary of Soil Analytical Results  
Area B  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Soil Table Footnotes:

- EGLE Part 201 residential and non-residential generic cleanup criteria and screening levels criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Release Date: December 30, 2013. Updated June 2018.

- Only detected analytes are listed - Gray rows indicate requested analyses. If no analytes are listed below a gray row then all analytes of that group were either not analyzed or not detected.

- **Bold** values are concentrations detected above the laboratory reporting limit.

- **Bold/Shaded** cells indicate analyte concentration exceeded applicable criteria. EGLE Part 201 criteria exceeded is indicated by the footnote in [brackets] following the result value and defined below:

- |                                                                                |                                                                                    |
|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| [2] - Groundwater Surface Water Interface Protection Criteria                  | [11] - Nonresidential Drinking Water Protection Criteria                           |
| [3] - Soil Saturation Concentration Screening Levels                           | [12] - Nonresidential Soil Volatilization to Indoor Air Inhalation Criteria (VIAC) |
| [4] - Residential Drinking Water Protection Criteria                           | [13] - Nonresidential Infinite Source Volatile Soil Inhalation Criteria (VSIC)     |
| [5] - Residential Soil Volatilization to Indoor Air Inhalation Criteria (VIAC) | [14] - Nonresidential Finite VSIC for 5 Meter Source Thickness                     |
| [6] - Residential Infinite Source Volatile Soil Inhalation Criteria (VSIC)     | [15] - Nonresidential Finite VSIC for 2 Meter Source Thickness                     |
| [7] - Residential Finite VSIC for 5 Meter Source Thickness                     | [16] - Nonresidential Particulate Soil Inhalation Criteria                         |
| [8] - Residential Finite VSIC for 2 Meter Source Thickness                     | [17] - Nonresidential Direct Contact Criteria                                      |
| [9] - Residential Particulate Soil Inhalation Criteria                         | [18] - Soil Residential MSSL                                                       |
| [10] - Residential Direct Contact Criteria                                     | [19] - Soil Nonresidential MSSL                                                    |

Evaluation based on EGLE Criteria at time of Project completion.

Samples described in this evaluation may actually refer to stamp sands or to other mining waste from the historic mining and reclamation processes conducted in the area.

- |                                  |                                                                                   |
|----------------------------------|-----------------------------------------------------------------------------------|
| -- = No Exceedances              | PCBs = Polychlorinated biphenyls                                                  |
| NM = Not Measured                | VOC = Volatile organic compound                                                   |
| ND = Not Detected                | SVOC = Semi-volatile organic compound                                             |
| bgs = Below ground surface       | MSSL = Media-Specific Volatilization to Indoor Air Interim Action Screening Level |
| ft = Feet                        | ug/kg = Micrograms per kilogram                                                   |
| in = Inches                      | % = Percentage                                                                    |
| mg/kg = Milligrams per kilogram. |                                                                                   |

Criteria Footnotes:

ID = Insufficient data to develop criterion.

NA = A criterion or value is not available

NLL = Hazardous substance is not likely to leach under most soil conditions.

(B) = Background, as defined in R 299.1(b), may be substituted if higher than the calculated cleanup criterion. Background levels may be less than criteria for some inorganic compounds.

(BB) = The state drinking water standard for asbestos (fibers greater than 10 micrometers in length) is in units of a million fibers per liter of water (MFL). Soil concentrations of asbestos are determined by polarized light microscop.

(C) = The criterion developed under R 299.20 to R 299.26 exceeds the chemical- specific soil saturation screening level (Csat). The person proposing or implementing response activity shall document whether additional response activity is required to control free-phase liquids or NAPL to protect against risks associated with free-phase liquids by using methods appropriate for the free-phase liquids present. Development of a site-specific Csat or methods presented in R 299.22, R 299.24(5), and R 299.26(8) may be conducted for the relevant exposure pathways.

(D) = Calculated criterion exceeds 100 percent, hence it is reduced to 100 percent or 1.0E+9 parts per billion (ppb).

(DD) = Hazardous substance causes developmental effects. Residential direct contact criteria are protective of both prenatal and postnatal exposure. Nonresidential direct contact criteria are protective for a pregnant adult receptor.

(F) = Criterion is based on adverse impacts to plant life and phytotoxicity.

(G) = Groundwater surface water interface (GSI) criterion depends on the pH or water hardness, or both, of the receiving surface water. The final chronic value (FCV) for the protection of aquatic life shall be calculated based on the pH or hardness of the receiving surface water. Where water hardness exceeds 400 mg Ca<sub>4</sub>/L, use 400 mg CaCO<sub>3</sub>/L for the FCV calculation. The FCV formula provides values in units of ug/L or ppb.

The generic GSI criterion is the lesser of the calculated FCV, the wildlife value (WV), and the surface water human non-drinking water value (HNDV). The soil GSI protection criteria for these hazardous substances are the greater of the 20 times the GSI criterion or the GSI soil-water partition values using the GSI criteria developed with the procedure described in this footnote. A spreadsheet that may be used to calculate GSI and GSI protection criteria for (G)-footnoted hazardous substances is available on the Department of Environment, Great Lakes, and Energy (EGLE) internet web site. A hardness value of 47.5 CaC<sub>4</sub>L and pH of 7, derived from the Michigan Department of Environmental Quality Draft Site Inspection Report for Lake Linden Operations dated 3/29/13, was used in the footnote G calculation spreadsheet.

(H) = Valence-specific chromium data (Cr III and Cr VI) shall be compared to the corresponding valence-specific cleanup criteria. If both Cr III and Cr VI are present in groundwater, the total concentration of both cannot exceed the drinking water criterion of 100 ug/L. If analytical data are provided for total chromium only, they shall be compared to the cleanup criteria for Cr VI. Cr III soil cleanup criterion for protection of drinking water can only be used at sites where groundwater is prevented from being used as a public water supply, currently and in the future, through an approved land or resource use restriction.

(I) = Hazardous substance may exhibit the characteristic of ignitability as defined in 40 C.F.R. §261.21 (revised as of July 1, 2001), which is adopted by reference in these rules and is available for inspection at the EGLE, 525 West Allegan Street, Lansing, Michigan. Copies of the regulation may be purchased, at a cost as of the time of adoption of these rules of \$45, from the Superintendent of documents, Government Printing Office, Washington, DC 20401 (stock number 869-044-00155-1), or from the EGLE, Remediation and Redevelopment Division (RRD), 525 West Allegan Street, Lansing, Michigan 48933, at cost.

(J) = Hazardous substance may be present in several isomer forms. Isomer-specific concentrations shall be added together for comparison to criteria.

(M) = Calculated criterion is below the analytical target detection limit, therefore, the criterion defaults to the target detection limit.

(P) = Amenable cyanide methods or method OIA-1677 shall be used to quantify cyanide concentrations for compliance with all groundwater criteria. Total cyanide methods or method OIA-1677 shall be used to quantify cyanide concentrations for compliance with soil criteria. Nonresidential direct contact criteria may not be protective of the potential for release of hydrogen cyanide gas. Additional land or resource use restrictions may be necessary to protect for the acute inhalation concerns associated with hydrogen cyanide gas.

(Q) = Criteria for carcinogenic polycyclic aromatic hydrocarbons were developed using relative potential potencies to benzo(a)pyrene.

(R) = Hazardous substance may exhibit the characteristic of reactivity as defined in 40 C.F.R. §261.23 (revised as of July 1, 2001), which is adopted by reference in these rules and is available for inspection at the EGLE, 525 West Allegan Street, Lansing, Michigan. Copies of the regulation may be purchased, at a cost as of the time of adoption of these rules of \$45, from the Superintendent of Documents, Government Printing Office, Washington, DC 20401 (stock number 869-044-00155-1), or from the EGLE, RRD, 525 West Allegan Street, Lansing, Michigan 48933, at cost.

(T) = Refer to the federal Toxic Substances Control Act (TSCA), 40 C.F.R. §761, Subpart D and 40 C.F.R. §761, Subpart G, to determine the applicability of TSCA cleanup standards. Subpart D and Subpart G of 40 C.F.R. §761 (July 1, 2001) are adopted by reference in these rules and are available for inspection at the EGLE, 525 West Allegan Street, Lansing, Michigan. Copies of the regulations may be purchased, at a cost as of the time of adoption of these rules of \$55, from the Superintendent of Documents, Government Printing Office, Washington, DC 20401, or from the EGLE, RRD, 525 West Allegan Street, Lansing, Michigan 48933, at cost. Alternatives to compliance with the TSCA standards listed below are possible under 40 C.F.R. §761 Subpart D. New releases may be subject to the standards identified in 40 C.F.R. §761, Subpart G. Use Part 201 soil direct contact cleanup criteria in the published table if TSCA standards are not applicable.

(X) = The GSI criterion shown in the generic cleanup criteria tables is not protective for surface water that is used as a drinking water source. (See R 299.49 Footnotes for generic cleanup criteria tables for additional information.)

(Z) = Mercury is typically measured as total mercury. The generic cleanup criteria, however, are based on data for different species of mercury. Specifically, data for elemental mercury, chemical abstract service (CAS) number 7439976, serve as the basis for the soil volatilization to indoor air criteria, groundwater volatilization to indoor air, and soil inhalation criteria. Data for methyl mercury, CAS number 22967926, serve as the basis for the GSI criterion; and data for mercuric chloride, CAS number 7487947, serve as the basis for the drinking water, groundwater contact, soil direct contact, and the groundwater protection criteria. Comparison to criteria shall be based on species-specific analytical data only if sufficient facility characterization has been conducted to rule out the presence of other species of mercury.

MSSL Footnotes:

J = Hazardous substance may be present in several isomer forms. Isomer-specific concentrations must be added together for comparison to screening level.

JT = Hazardous substance may be present in several isomer forms. Screening levels may be used for the individual isomer provided that it is the sole isomer detected; however, when multiple isomers are detected in a medium, the isomer-specific concentrations must be added together and compared to the most restrictive screening level of the detected isomers.

M = The screening level may be below target detection limits (TDL).

Laboratory Footnotes:

J = The result is an estimated quantity.

U = Analyte analyzed for but not detected above the reported sample reporting limit.

UU = Analyte analyzed for but not detected above the reported sample reporting limit and is an estimated quantity.

**TABLE 6-1**  
**Summary of Soil Analytical Results**  
**Area B**  
**Quincy Mining Company Portage Operations Area**  
**Abandoned Mining Wastes - Torch Lake Non-Superfund Site**

|                                                                                                         | Part 201 Generic Cleanup Criteria Evaluated                                        | Exceedance |
|---------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------|
| <b>EGLE Part 201 Generic Cleanup Criteria<br/>(June 2018)</b>                                           | [2] - Groundwater Surface Water Interface Protection Criteria                      | YES        |
|                                                                                                         | [3] - Soil Saturation Concentration Screening Levels                               | NO         |
|                                                                                                         | [4] - Residential Drinking Water Protection Criteria                               | YES        |
|                                                                                                         | [5] - Residential Soil Volatilization to Indoor Air Inhalation Criteria (VIAC)     | YES        |
|                                                                                                         | [6] - Residential Infinite Source Volatile Soil Inhalation Criteria (VSIC)         | NO         |
|                                                                                                         | [7] - Residential Finite VSIC for 5 Meter Source Thickness                         | NO         |
|                                                                                                         | [8] - Residential Finite VSIC for 2 Meter Source Thickness                         | NO         |
|                                                                                                         | [9] - Residential Particulate Soil Inhalation Criteria                             | NO         |
|                                                                                                         | [10] - Residential Direct Contact Criteria                                         | YES        |
|                                                                                                         | [11] - Nonresidential Drinking Water Protection Criteria                           | YES        |
|                                                                                                         | [12] - Nonresidential Soil Volatilization to Indoor Air Inhalation Criteria (VIAC) | NO         |
|                                                                                                         | [13] - Nonresidential Infinite Source Volatile Soil Inhalation Criteria (VSIC)     | NO         |
|                                                                                                         | [14] - Nonresidential Finite VSIC for 5 Meter Source Thickness                     | NO         |
|                                                                                                         | [15] - Nonresidential Finite VSIC for 2 Meter Source Thickness                     | NO         |
|                                                                                                         | [16] - Nonresidential Particulate Soil Inhalation Criteria                         | NO         |
|                                                                                                         | [17] - Nonresidential Direct Contact Criteria                                      | YES        |
| <b>Media-Specific Volatilization to Indoor Air Interim<br/>Action Screening Levels<br/>(March 2021)</b> | [18] - Soil Residential Media-Specific Screening Level (MSSL)                      | YES        |
|                                                                                                         | [19] - Soil Nonresidential MSSL                                                    | YES        |

TABLE 6-2  
Summary of Groundwater Analytical Results  
Area B  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code                      |            | EGLE Part 201 Generic Cleanup Criteria           |                                                     |                                                              |                                                                                                |                                                                                                   |                         | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                                         |                                            |                                               |                                               |                                                             | Area B      |             |                     |             |             |         |             |         |             |         |             |         |
|------------------------------------|------------|--------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------|-----------------------------------------------|-----------------------------------------------|-------------------------------------------------------------|-------------|-------------|---------------------|-------------|-------------|---------|-------------|---------|-------------|---------|-------------|---------|
| Station Name                       | CAS Number | [1]<br>Residential<br>Drinking Water<br>Criteria | [2]<br>Nonresidential<br>Drinking Water<br>Criteria | [3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [4]<br>Residential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [5]<br>Nonresidential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [6]<br>Water Solubility | [8]<br>Shallow<br>Groundwater<br>Residential<br>MSSL                        | [9]<br>Shallow<br>Groundwater<br>Nonresidential<br>MSSL | [10]<br>Groundwater<br>Residential<br>MSSL | [11]<br>Groundwater<br>Residential TS<br>MSSL | [12]<br>Groundwater<br>Nonresidential<br>MSSL | [13]<br>Groundwater<br>Nonresidential<br>MSSL <sub>12</sub> | SB-101      |             |                     |             | SB-102      |         | SB-103      |         | SB-104      |         | SB-105      |         |
| Field Sample ID                    |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 5381 SB-101 |             | 5381 SB-101 Cleanup |             | 5382 SB-102 |         | 5383 SB-103 |         | 5384 SB-104 |         | 5385 SB-105 |         |
| Sample Date                        |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 7/19/1995   |             | 7/19/1995           |             | 7/19/1995   |         | 7/19/1995   |         | 7/19/1995   |         | 7/19/1995   |         |
| Sample Interval (bgs)              |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | --          |             | --                  |             | --          |         | --          |         | --          |         | --          |         |
|                                    |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | Result      | Exceeds     | Result              | Exceeds     | Result      | Exceeds | Result      | Exceeds | Result      | Exceeds | Result      | Exceeds |
| Inorganics - Metals (ug/l)         |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |             |                     |             |             |         |             |         |             |         |             |         |
| ARSENIC                            | 7440-38-2  | 10 (A)                                           | 10 (A)                                              | 10                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --          | NM                  | --          | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| BARIUM                             | 7440-39-3  | 2,000 (A,B)                                      | 2,000 (A,B)                                         | 200 (B,G)                                                    | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --          | NM                  | --          | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| CADMIUM                            | 7440-43-9  | 5.0 (A,B)                                        | 5.0 (A,B)                                           | 1.3 (B,G,X)                                                  | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --          | NM                  | --          | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| CALCIUM                            | 7440-70-2  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --          | NM                  | --          | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| CHROMIUM                           | 7440-47-3  | 100 (A,B,H)                                      | 100 (A,B,H)                                         | 40 (B,G,H,X)                                                 | NA                                                                                             | NLV                                                                                               | NLV                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --          | NM                  | --          | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| COPPER                             | 7440-50-8  | 4.0 (B,E)                                        | 4.0 (B,E)                                           | 14 (B,G)                                                     | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --          | NM                  | --          | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| LEAD                               | 7439-92-1  | 4.0 (B,L)                                        | 4.0 (B,L)                                           | 14 (B,G,X)                                                   | NVL                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 0.023       | --          | NM                  | --          | <0.003 U    | --      | 0.003       | --      | <0.003 U    | --      | <0.003 U    | --      |
| MAGNESIUM                          | 7439-95-4  | 400,000 (B)                                      | 1,100,000 (B)                                       | NA                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --          | NM                  | --          | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| MANGANESE                          | 7439-96-5  | 50 (B,E)                                         | 50 (B,E)                                            | 1,000 (B,G,X)                                                | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --          | NM                  | --          | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| MERCURY                            | 7439-97-6  | 2.0 (A,B,Z)                                      | 2.0 (A,B,Z)                                         | 0.0013 (B,Z)                                                 | 56 (B,S,Z)                                                                                     | 56 (B,S,Z)                                                                                        | 56 (B,Z)                | 0.088                                                                       | 0.14                                                    | 1.4                                        | 4.3                                           | 4.3                                           | 8.5                                                         | NM          | --          | NM                  | --          | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| POTASSIUM                          | 7440-09-7  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --          | NM                  | --          | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| SELENIUM                           | 7782-49-2  | 50 (A,B)                                         | 50 (A,B)                                            | 5 (B)                                                        | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --          | NM                  | --          | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| SILVER                             | 7440-22-4  | 34 (B)                                           | 98 (B)                                              | 0.2 (B,M)                                                    | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --          | NM                  | --          | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| SODIUM                             | 7440-23-5  | 230,000 (HH)                                     | 350,000                                             | NA                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --          | NM                  | --          | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| STRONTIUM                          | 7440-24-6  | 4,600 (B)                                        | 13,000 (B)                                          | 21,000 (B)                                                   | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --          | NM                  | --          | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| ZINC                               | 7440-66-6  | 2,400 (B)                                        | 5,000 (B,E)                                         | 63 (B,G)                                                     | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --          | NM                  | --          | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| Organics - PCBs as Aroclors (ug/l) |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |             |                     |             |             |         |             |         |             |         |             |         |
| TOTAL PCBs                         | 1336-36-6  | 0.5 (A,J,T)                                      | 0.5 (A,J,T)                                         | 0.2 (J,M,T)                                                  | 45 (J,S,T)                                                                                     | 45 (J,S,T)                                                                                        | 44.7 (J,T)              | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --          | NM                  | --          | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| Organics - SVOCs (ug/l)            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |             |                     |             |             |         |             |         |             |         |             |         |
| 2-METHYLNAPHTHALENE (SVOC)         | 91-57-6S   | 260                                              | 750                                                 | 19                                                           | 25,000 (S)                                                                                     | 25,000 (S)                                                                                        | 24,600                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --          | NM                  | --          | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| ACENAPHTHENE                       | 83-32-9    | 1,300                                            | 3,800                                               | 38                                                           | 4,200 (S)                                                                                      | 4,200 (S)                                                                                         | 4,240                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <50 U       | --          | <25 UJ              | --          | <5 U        | --      | <5 U        | --      | <5 U        | --      | <5 U        | --      |
| ACENAPHTHYLENE                     | 208-96-8   | 52                                               | 150                                                 | ID                                                           | 3,900 (S)                                                                                      | 3,900 (S)                                                                                         | 3,930                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <50 U       | --          | <25 UJ              | --          | <5 U        | --      | <5 U        | --      | <5 U        | --      | <5 U        | --      |
| ANTHRACENE                         | 120-12-7   | 43 (S)                                           | 43 (S)                                              | ID                                                           | 43 (S)                                                                                         | 43 (S)                                                                                            | 43.4                    | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 91          | [1,2,4,5,6] | 82 J                | [1,2,4,5,6] | <5 U        | --      | <5 U        | --      | <5 U        | --      | <5 U        | --      |
| BENZO(A)ANTHRACENE                 | 56-55-3    | 2.1 (Q)                                          | 8.5 (Q)                                             | ID                                                           | NLV                                                                                            | NLV                                                                                               | 9.4 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <50 U       | --          | <25 UJ              | --          | <5 U        | --      | <5 U        | --      | <5 U        | --      | <5 U        | --      |
| BENZO(A)PYRENE                     | 50-32-8    | 5.0 (A,Q)                                        | 5.0 (A,Q)                                           | ID                                                           | NLV                                                                                            | NLV                                                                                               | 1.62 (Q)                | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <50 U       | --          | <25 UJ              | --          | <5 U        | --      | <5 U        | --      | <5 U        | --      | <5 U        | --      |
| BENZO(B)FLUORANTHENE               | 205-99-2   | 1.5 (Q,S,AA)                                     | 1.5 (Q,S,AA)                                        | ID                                                           | ID                                                                                             | ID                                                                                                | 1.5 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <50 U       | --          | <25 UJ              | --          | <5 U        | --      | <5 U        | --      | <5 U        | --      | <5 U        | --      |
| BENZO(G,H,I)PERYLENE               | 191-24-2   | 1.0 (M)                                          | 1.0 (M)                                             | ID                                                           | NLV                                                                                            | NLV                                                                                               | 0.26                    | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <50 U       | --          | <25 UJ              | --          | <5 U        | --      | <5 U        | --      | <5 U        | --      | <5 U        | --      |
| BENZO(K)FLUORANTHENE               | 207-08-9   | 1.0 (M,Q)                                        | 1.0 (M,Q)                                           | NA                                                           | NLV                                                                                            | NLV                                                                                               | 0.8 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <50 U       | --          | <25 UJ              | --          | <5 U        | --      | <5 U        | --      | <5 U        | --      | <5 U        | --      |
| CHRYSENE                           | 218-01-9   | 1.6 (Q,S)                                        | 1.6 (Q,S)                                           | ID                                                           | ID                                                                                             | ID                                                                                                | 1.6 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <50 U       | --          | <25 UJ              | --          | <5 U        | --      | <5 U        | --      | <5 U        | --      | <5 U        | --      |
| FLUORANTHENE                       | 206-44-0   | 210 (S)                                          | 210 (S)                                             | 1.6                                                          | 210 (S)                                                                                        | 210 (S)                                                                                           | 206                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <50 U       | --          | <25 UJ              | --          | <5 U        | --      | <5 U        | --      | <5 U        | --      | <5 U        | --      |
| FLUORENE                           | 86-73-7    | 880                                              | 2,000 (S)                                           | 12                                                           | 2,000 (S)                                                                                      | 2,000 (S)                                                                                         | 1,980                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 55          | [3]         | 56 J                | [3]         | <5 U        | --      | <5 U        | --      | <5 U        | --      | <5 U        | --      |
| INDENO(1,2,3-CD)PYRENE             | 193-39-5   | 2.0 (M,Q)                                        | 2.0 (M,Q)                                           | ID                                                           | NLV                                                                                            | NLV                                                                                               | 0.022 (Q)               | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <50 U       | --          | <25 UJ              | --          | <5 U        | --      | <5 U        | --      | <5 U        | --      | <5 U        | --      |
| NAPHTHALENE (SVOC)                 | 91-20-3S   | 520                                              | 1,500                                               | 11                                                           | 31,000 (S)                                                                                     | 31,000 (S)                                                                                        | 31,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 1,100       | [1,3]       | 1,100 J             | [1,3]       | <5 U        | --      | 37          | [3]     | <5 U        | --      | <5 U        | --      |
| PENTACHLOROPHENOL                  | 87-86-5    | 1.0 (A)                                          | 1.0 (A)                                             | 1.8 (G,X)                                                    | NLV                                                                                            | NLV                                                                                               | 1.85E+06                | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --          | NM                  | --          | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| PHENANTHRENE                       | 85-01-8    | 52                                               | 150                                                 | 2.0 (M)                                                      | 1,000 (S)                                                                                      | 1,000 (S)                                                                                         | 1,000                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <50 U       | --          | 73 J                | [1,3]       | <5 U        | --      | <5 U        | --      | <5 U        | --      | <5 U        | --      |
| PYRENE                             | 129-00-0   | 140 (S)                                          | 140 (S)                                             | ID                                                           | 140 (S)                                                                                        | 140 (S)                                                                                           | 135                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <50 U       | --          | <25 UJ              | --          | <5 U        | --      | <5 U        | --      | <5 U        | --      | <5 U        | --      |

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 6-2  
Summary of Groundwater Analytical Results  
Area B  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code              |            | EGLE Part 201 Generic Cleanup Criteria           |                                                     |                                                              |                                                                                                |                                                                                                   |                         | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                                         |                                            |                                               |                                               |                                                             | Area B      |                         |                     |         |             |         |             |                |             |         |             |         |
|----------------------------|------------|--------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------|-----------------------------------------------|-----------------------------------------------|-------------------------------------------------------------|-------------|-------------------------|---------------------|---------|-------------|---------|-------------|----------------|-------------|---------|-------------|---------|
| Station Name               | CAS Number | [1]<br>Residential<br>Drinking Water<br>Criteria | [2]<br>Nonresidential<br>Drinking Water<br>Criteria | [3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [4]<br>Residential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [5]<br>Nonresidential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [6]<br>Water Solubility | [8]<br>Shallow<br>Groundwater<br>Residential<br>MSSL                        | [9]<br>Shallow<br>Groundwater<br>Nonresidential<br>MSSL | [10]<br>Groundwater<br>Residential<br>MSSL | [11]<br>Groundwater<br>Residential TS<br>MSSL | [12]<br>Groundwater<br>Nonresidential<br>MSSL | [13]<br>Groundwater<br>Nonresidential<br>MSSL <sub>12</sub> | SB-101      |                         |                     |         | SB-102      |         | SB-103      |                | SB-104      |         | SB-105      |         |
| Field Sample ID            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 5381 SB-101 |                         | 5381 SB-101 Cleanup |         | 5382 SB-102 |         | 5383 SB-103 |                | 5384 SB-104 |         | 5385 SB-105 |         |
| Sample Date                |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 7/19/1995   |                         | 7/19/1995           |         | 7/19/1995   |         | 7/19/1995   |                | 7/19/1995   |         | 7/19/1995   |         |
| Sample Interval (bgs)      |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | --          |                         | --                  |         | --          |         | --          |                | --          |         | --          |         |
|                            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | Result      | Exceeds                 | Result              | Exceeds | Result      | Exceeds | Result      | Exceeds        | Result      | Exceeds | Result      | Exceeds |
| Organics - VOCs (ug/l)     |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |                         |                     |         |             |         |             |                |             |         |             |         |
| 1,1,1-TRICHLOROETHANE      | 71-55-6    | 200 (A)                                          | 200 (A)                                             | 89                                                           | 660,000                                                                                        | 1,300,000 (S)                                                                                     | 1,330,000               | 180                                                                         | 500                                                     | 8,600                                      | 8,600                                         | 24,000                                        | 24,000                                                      | NM          | --                      | NM                  | --      | NM          | --      | NM          | --             | NM          | --      | NM          | --      |
| 1,2,3-TRIMETHYLBENZENE     | 526-73-8   | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | 43 (JT)                                                                     | 67 (JT)                                                 | 800 (JT)                                   | 2,400 (JT)                                    | 2,300 (JT)                                    | 4,700 (JT)                                                  | NM          | --                      | NM                  | --      | NM          | --      | NM          | --             | NM          | --      | NM          | --      |
| 1,2,4-TRIMETHYLBENZENE     | 95-63-6    | 63 (E,I)                                         | 63 (E,I)                                            | 17 (I)                                                       | 56,000 (I,S)                                                                                   | 56,000 (I,S)                                                                                      | 55,890 (I)              | 25 (JT)                                                                     | 44 (JT)                                                 | 440 (JT)                                   | 1,300 (JT)                                    | 1,300 (JT)                                    | 2,600 (JT)                                                  | NM          | --                      | NM                  | --      | NM          | --      | NM          | --             | NM          | --      | NM          | --      |
| 1,3,5-TRIMETHYLBENZENE     | 108-67-8   | 72 (E,I)                                         | 72 (E,I)                                            | 45 (I)                                                       | 61,000 (I,S)                                                                                   | 61,000 (I,S)                                                                                      | 61,150 (I)              | 18 (JT)                                                                     | 30 (JT)                                                 | 310 (JT)                                   | 940 (JT)                                      | 920 (JT)                                      | 1,800 (JT)                                                  | NM          | --                      | NM                  | --      | NM          | --      | NM          | --             | NM          | --      | NM          | --      |
| 2-METHYLNAPHTHALENE (VOC)  | 91-57-6V   | 260                                              | 750                                                 | 19                                                           | 25,000 (S)                                                                                     | 25,000 (S)                                                                                        | 24,600                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --                      | NM                  | --      | NM          | --      | NM          | --             | NM          | --      | NM          | --      |
| ACETONE                    | 67-64-1    | 730 (I)                                          | 2100 (I)                                            | 1700 (I)                                                     | 1.0E+9 (D,I,S)                                                                                 | 1.0E+9 (D,I,S)                                                                                    | 1.0E+9 (I)              | 50,000                                                                      | 62,000                                                  | 1.20E+07                                   | 1.20E+07                                      | 2.50E+07                                      | 2.50E+07                                                    | NM          | --                      | NM                  | --      | NM          | --      | NM          | --             | NM          | --      | NM          | --      |
| BENZENE                    | 71-43-2    | 5.0 (A,I)                                        | 5.0 (A,I)                                           | 12 (I,X)                                                     | 5,600 (I)                                                                                      | 35,000 (I)                                                                                        | 1,750,000 (I)           | 1                                                                           | 2.7                                                     | 14                                         | 82                                            | 66                                            | 130                                                         | 1,800       | [1,2,3,8,9,10,11,12,13] | NM                  | --      | <5 U        | --      | 53          | [1,2,3,8,9,10] | <5 U        | --      | <5 U        | --      |
| CYCLOHEXANE                | 110-82-7   | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --                      | NM                  | --      | NM          | --      | NM          | --             | NM          | --      | NM          | --      |
| ETHYLBENZENE               | 100-41-4   | 74 (E,I)                                         | 74 (E,I)                                            | 18 (I)                                                       | 110,000 (I)                                                                                    | 170,000 (I,S)                                                                                     | 169,000 (I)             | 2.8                                                                         | 7.6                                                     | 45                                         | 450                                           | 210                                           | 420                                                         | 1,200       | [1,2,3,8,9,10,11,12,13] | NM                  | --      | 3.0         | [8]     | 94          | [1,2,3,8,9,10] | <1 U        | --      | <1 U        | --      |
| HEXANE                     | 110-54-3   | 3,000                                            | 8,600                                               | NA                                                           | 12,000 (S)                                                                                     | 12,000 (S)                                                                                        | 12,000                  | 29                                                                          | 85                                                      | 29 (GW)                                    | 33                                            | 85 (GW)                                       | 170 (GW)                                                    | NM          | --                      | NM                  | --      | NM          | --      | NM          | --             | NM          | --      | NM          | --      |
| ISOPROPYLBENZENE           | 98-82-8    | 800                                              | 2,300                                               | 28                                                           | 56,000 (S)                                                                                     | 56,000 (S)                                                                                        | 56,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --                      | NM                  | --      | NM          | --      | NM          | --             | NM          | --      | NM          | --      |
| M,P-XYLENE                 | 1330-20-7  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --                      | NM                  | --      | NM          | --      | NM          | --             | NM          | --      | NM          | --      |
| NAPHTHALENE (VOC)          | 91-20-3V   | 520                                              | 1,500                                               | 11                                                           | 31,000 (S)                                                                                     | 31,000 (S)                                                                                        | 31,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --                      | NM                  | --      | NM          | --      | NM          | --             | NM          | --      | NM          | --      |
| N-PROPYLBENZENE            | 103-65-1   | 80 (I)                                           | 230 (I)                                             | ID                                                           | ID                                                                                             | ID                                                                                                | NA                      | 43                                                                          | 83                                                      | 4100                                       | 12000                                         | 8100                                          | 8100                                                        | NM          | --                      | NM                  | --      | NM          | --      | NM          | --             | NM          | --      | NM          | --      |
| O-XYLENE                   | 95-47-6    | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --                      | NM                  | --      | NM          | --      | NM          | --             | NM          | --      | NM          | --      |
| TETRACHLOROETHYLENE        | 127-18-4   | 5.0 (A)                                          | 5.0 (A)                                             | 11 (X)                                                       | 25,000                                                                                         | 170,000                                                                                           | 200,000                 | 1.5                                                                         | 3                                                       | 96                                         | 96                                            | 190                                           | 380                                                         | NM          | --                      | NM                  | --      | NM          | --      | NM          | --             | NM          | --      | NM          | --      |
| TOLUENE                    | 108-88-3   | 790 (E,I)                                        | 790 (E,I)                                           | 270 (I)                                                      | 530,000 (I,S)                                                                                  | 530,000 (I,S)                                                                                     | 526,000 (I)             | 300                                                                         | 570                                                     | 23,000                                     | 33,000                                        | 66,000                                        | 66,000                                                      | 4,800       | [1,2,3,8,9]             | NM                  | --      | 5           | --      | 18          | --             | <1 U        | --      | <1 U        | --      |
| TRICHLOROETHYLENE          | 79-01-6    | 5.0 (A)                                          | 5.0 (A)                                             | 29 (X)                                                       | 2,200                                                                                          | 4,900                                                                                             | 1,100,000               | 0.073 (M)                                                                   | 0.14 (M)                                                | 6.1                                        | 18                                            | 12                                            | 24                                                          | NM          | --                      | NM                  | --      | NM          | --      | NM          | --             | NM          | --      | NM          | --      |
| XYLENE - TOTAL             | 1330-20-7  | 280 (E,I)                                        | 280 (E,I)                                           | 49 (I)                                                       | 190,000 (I,S)                                                                                  | 190,000 (I,S)                                                                                     | 186,000 (I)             | 75 (J)                                                                      | 120 (J)                                                 | 1,200 (J)                                  | 3,600 (J)                                     | 3,500 (J)                                     | 7,100 (J)                                                   | 5,600       | [1,2,3,8,9,10,11,12]    | NM                  | --      | 13          | --      | 260         | [3,8,9]        | <3 U        | --      | 5           | --      |
| Other                      |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |                         |                     |         |             |         |             |                |             |         |             |         |
| CHLORIDE (mg/l)            | 16887-00-6 | 250,000 (E)                                      | 250,000 (E)                                         | 50 (FF)                                                      | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --                      | NM                  | --      | NM          | --      | NM          | --             | NM          | --      | NM          | --      |
| NITROGEN (mg/l)            | 7727-37-9  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --                      | NM                  | --      | NM          | --      | NM          | --             | NM          | --      | NM          | --      |
| HYDROCARBONS, TOTAL (mg/l) | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --                      | NM                  | --      | NM          | --      | NM          | --             | NM          | --      | NM          | --      |
| Water Quality Parameters   |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |                         |                     |         |             |         |             |                |             |         |             |         |
| TEMPERATURE (°C)           | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --                      | NM                  | --      | NM          | --      | NM          | --             | NM          | --      | NM          | --      |
| CONDUCTIVITY (mS/cm)       | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --                      | NM                  | --      | NM          | --      | NM          | --             | NM          | --      | NM          | --      |
| DISSOLVED OXYGEN (%)       | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --                      | NM                  | --      | NM          | --      | NM          | --             | NM          | --      | NM          | --      |
| pH                         | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --                      | NM                  | --      | NM          | --      | NM          | --             | NM          | --      | NM          | --      |
| TURBIDITY (nTu)            | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --                      | NM                  | --      | NM          | --      | NM          | --             | NM          | --      | NM          | --      |

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 6-2  
Summary of Groundwater Analytical Results  
Area B  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code                      |            | EGLE Part 201 Generic Cleanup Criteria           |                                                     |                                                              |                                                                                                |                                                                                                   |                         | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                                         |                                            |                                               |                                               |                                                             | Area B      |         |             |         |             |         |             |         |             |         |                     |         |             |         |             |         |
|------------------------------------|------------|--------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------|-----------------------------------------------|-----------------------------------------------|-------------------------------------------------------------|-------------|---------|-------------|---------|-------------|---------|-------------|---------|-------------|---------|---------------------|---------|-------------|---------|-------------|---------|
| Station Name                       | CAS Number | [1]<br>Residential<br>Drinking Water<br>Criteria | [2]<br>Nonresidential<br>Drinking Water<br>Criteria | [3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [4]<br>Residential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [5]<br>Nonresidential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [6]<br>Water Solubility | [8]<br>Shallow<br>Groundwater<br>Residential<br>MSSL                        | [9]<br>Shallow<br>Groundwater<br>Nonresidential<br>MSSL | [10]<br>Groundwater<br>Residential<br>MSSL | [11]<br>Groundwater<br>Residential TS<br>MSSL | [12]<br>Groundwater<br>Nonresidential<br>MSSL | [13]<br>Groundwater<br>Nonresidential<br>MSSL <sub>12</sub> | SB-106      |         | SB-107      |         | SB-108      |         | SB-109      |         | SB-110      |         |                     |         | SB-111      |         | SB-112      |         |
| Field Sample ID                    |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 5386 SB-106 |         | 5387 SB-107 |         | 5388 SB-108 |         | 5389 SB-109 |         | 5390 SB-110 |         | 5390 SB-110 Cleanup |         | 5391 SB-111 |         | 5392 SB-112 |         |
| Sample Date                        |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 7/19/1995   |         | 7/19/1995   |         | 7/19/1995   |         | 7/19/1995   |         | 7/19/1995   |         | 7/19/1995           |         | 7/19/1995   |         | 7/19/1995   |         |
| Sample Interval (bgs)              |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | --          |         | --          |         | --          |         | --          |         | --          |         | --                  |         | --          |         | --          |         |
|                                    |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | Result      | Exceeds | Result      | Exceeds | Result      | Exceeds | Result      | Exceeds | Result      | Exceeds | Result              | Exceeds | Result      | Exceeds | Result      | Exceeds |
| Inorganics - Metals (ug/l)         |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |         |             |         |             |         |             |         |             |         |                     |         |             |         |             |         |
| ARSENIC                            | 7440-38-2  | 10 (A)                                           | 10 (A)                                              | 10                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      |
| BARIUM                             | 7440-39-3  | 2,000 (A,B)                                      | 2,000 (A,B)                                         | 200 (B,G)                                                    | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      |
| CADMIUM                            | 7440-43-9  | 5.0 (A,B)                                        | 5.0 (A,B)                                           | 1.3 (B,G,X)                                                  | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      |
| CALCIUM                            | 7440-70-2  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      |
| CHROMIUM                           | 7440-47-3  | 100 (A,B,H)                                      | 100 (A,B,H)                                         | 40 (B,G,H,X)                                                 | NA                                                                                             | NLV                                                                                               | NLV                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      |
| COPPER                             | 7440-50-8  | 4.0 (B,E)                                        | 4.0 (B,E)                                           | 14 (B,G)                                                     | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      |
| LEAD                               | 7439-92-1  | 4.0 (B,L)                                        | 4.0 (B,L)                                           | 14 (B,G,X)                                                   | NVL                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <0.003 U    | --      | <0.003 U    | --      | 0.009       | --      | 0.012       | --      | 0.004       | --      | NM                  | --      | <0.003 U    | --      | <0.003 U    | --      |
| MAGNESIUM                          | 7439-95-4  | 400,000 (B)                                      | 1,100,000 (B)                                       | NA                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      |
| MANGANESE                          | 7439-96-5  | 50 (B,E)                                         | 50 (B,E)                                            | 1,000 (B,G,X)                                                | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      |
| MERCURY                            | 7439-97-6  | 2.0 (A,B,Z)                                      | 2.0 (A,B,Z)                                         | 0.0013 (B,Z)                                                 | 56 (B,S,Z)                                                                                     | 56 (B,S,Z)                                                                                        | 56 (B,Z)                | 0.088                                                                       | 0.14                                                    | 1.4                                        | 4.3                                           | 4.3                                           | 8.5                                                         | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      |
| POTASSIUM                          | 7440-09-7  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      |
| SELENIUM                           | 7782-49-2  | 50 (A,B)                                         | 50 (A,B)                                            | 5 (B)                                                        | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      |
| SILVER                             | 7440-22-4  | 34 (B)                                           | 98 (B)                                              | 0.2 (B,M)                                                    | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      |
| SODIUM                             | 7440-23-5  | 230,000 (HH)                                     | 350,000                                             | NA                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      |
| STRONTIUM                          | 7440-24-6  | 4,600 (B)                                        | 13,000 (B)                                          | 21,000 (B)                                                   | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      |
| ZINC                               | 7440-66-6  | 2,400 (B)                                        | 5,000 (B,E)                                         | 63 (B,G)                                                     | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      |
| Organics - PCBs as Aroclors (ug/l) |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |         |             |         |             |         |             |         |             |         |                     |         |             |         |             |         |
| TOTAL PCBs                         | 1336-36-6  | 0.5 (A,J,T)                                      | 0.5 (A,J,T)                                         | 0.2 (J,M,T)                                                  | 45 (J,S,T)                                                                                     | 45 (J,S,T)                                                                                        | 44.7 (J,T)              | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      |
| Organics - SVOCs (ug/l)            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |         |             |         |             |         |             |         |             |         |                     |         |             |         |             |         |
| 2-METHYLNAPHTHALENE (SVOC)         | 91-57-6S   | 260                                              | 750                                                 | 19                                                           | 25,000 (S)                                                                                     | 25,000 (S)                                                                                        | 24,600                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      |
| ACENAPHTHENE                       | 83-32-9    | 1,300                                            | 3,800                                               | 38                                                           | 4,200 (S)                                                                                      | 4,200 (S)                                                                                         | 4,240                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | <5 U        | --      | <5 U        | --      | <5 U        | --      | <25 U       | --      | <5 UJ               | --      | <5 U        | --      | <5 U        | --      |
| ACENAPHTHYLENE                     | 208-96-8   | 52                                               | 150                                                 | ID                                                           | 3,900 (S)                                                                                      | 3,900 (S)                                                                                         | 3,930                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | <5 U        | --      | <5 U        | --      | <5 U        | --      | <25 U       | --      | <5 UJ               | --      | <5 U        | --      | <5 U        | --      |
| ANTHRACENE                         | 120-12-7   | 43 (S)                                           | 43 (S)                                              | ID                                                           | 43 (S)                                                                                         | 43 (S)                                                                                            | 43.4                    | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | <5 U        | --      | 10          | --      | 7           | --      | 34          | --      | 10 J                | --      | 7           | --      | <5 U        | --      |
| BENZO(A)ANTHRACENE                 | 56-55-3    | 2.1 (Q)                                          | 8.5 (Q)                                             | ID                                                           | NLV                                                                                            | NLV                                                                                               | 9.4 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | <5 U        | --      | <5 U        | --      | <5 U        | --      | <25 U       | --      | <5 UJ               | --      | <5 U        | --      | <5 U        | --      |
| BENZO(A)PYRENE                     | 50-32-8    | 5.0 (A,Q)                                        | 5.0 (A,Q)                                           | ID                                                           | NLV                                                                                            | NLV                                                                                               | 1.62 (Q)                | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | <5 U        | --      | <5 U        | --      | <5 U        | --      | <25 U       | --      | <5 UJ               | --      | <5 U        | --      | <5 U        | --      |
| BENZO(B)FLUORANTHENE               | 205-99-2   | 1.5 (Q,S,AA)                                     | 1.5 (Q,S,AA)                                        | ID                                                           | ID                                                                                             | ID                                                                                                | 1.5 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | <5 U        | --      | <5 U        | --      | <5 U        | --      | <25 U       | --      | <5 UJ               | --      | <5 U        | --      | <5 U        | --      |
| BENZO(G,H,I)PERYLENE               | 191-24-2   | 1.0 (M)                                          | 1.0 (M)                                             | ID                                                           | NLV                                                                                            | NLV                                                                                               | 0.26                    | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | <5 U        | --      | <5 U        | --      | <5 U        | --      | <25 U       | --      | <5 UJ               | --      | <5 U        | --      | <5 U        | --      |
| BENZO(K)FLUORANTHENE               | 207-08-9   | 1.0 (M,Q)                                        | 1.0 (M,Q)                                           | NA                                                           | NLV                                                                                            | NLV                                                                                               | 0.8 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | <5 U        | --      | <5 U        | --      | <5 U        | --      | <25 U       | --      | <5 UJ               | --      | <5 U        | --      | <5 U        | --      |
| CHRYSENE                           | 218-01-9   | 1.6 (Q,S)                                        | 1.6 (Q,S)                                           | ID                                                           | ID                                                                                             | ID                                                                                                | 1.6 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | <5 U        | --      | <5 U        | --      | <5 U        | --      | <25 U       | --      | <5 UJ               | --      | <5 U        | --      | <5 U        | --      |
| FLUORANTHENE                       | 206-44-0   | 210 (S)                                          | 210 (S)                                             | 1.6                                                          | 210 (S)                                                                                        | 210 (S)                                                                                           | 206                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | <5 U        | --      | 6           | [3]     | <5 U        | --      | <25 U       | --      | <5 UJ               | --      | <5 U        | --      | <5 U        | --      |
| FLUORENE                           | 86-73-7    | 880                                              | 2,000 (S)                                           | 12                                                           | 2,000 (S)                                                                                      | 2,000 (S)                                                                                         | 1,980                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | <5 U        | --      | <5 U        | --      | <5 U        | --      | <25 U       | --      | <5 UJ               | --      | <5 U        | --      | <5 U        | --      |
| INDENO(1,2,3-CD)PYRENE             | 193-39-5   | 2.0 (M,Q)                                        | 2.0 (M,Q)                                           | ID                                                           | NLV                                                                                            | NLV                                                                                               | 0.022 (Q)               | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | <5 U        | --      | <5 U        | --      | <5 U        | --      | <25 U       | --      | <5 UJ               | --      | <5 U        | --      | <5 U        | --      |
| NAPHTHALENE (SVOC)                 | 91-20-3S   | 520                                              | 1,500                                               | 11                                                           | 31,000 (S)                                                                                     | 31,000 (S)                                                                                        | 31,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | <5 U        | --      | 23          | [3]     | 82          | [3]     | 50          | [3]     | 11 J                | --      | 28          | [3]     | <5 U        | --      |
| PENTACHLOROPHENOL                  | 87-86-5    | 1.0 (A)                                          | 1.0 (A)                                             | 1.8 (G,X)                                                    | NLV                                                                                            | NLV                                                                                               | 1.85E+06                | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM                  | --      | NM          | --      | NM          | --      |
| PHENANTHRENE                       | 85-01-8    | 52                                               | 150                                                 | 2.0 (M)                                                      | 1,000 (S)                                                                                      | 1,000 (S)                                                                                         | 1,000                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | <5 U        | --      | <5 U        | --      | <5 U        | --      | <25 U       | --      | <5 UJ               | --      | <5 U        | --      | <5 U        | --      |
| PYRENE                             | 129-00-0   | 140 (S)                                          | 140 (S)                                             | ID                                                           | 140 (S)                                                                                        | 140 (S)                                                                                           | 135                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | <5 U        | --      | <5 U        | --      | <5 U        | --      | <25 U       | --      | 6 J                 | --      | <5 U        | --      | <5 U        | --      |

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 6-2  
Summary of Groundwater Analytical Results  
Area B  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code              |            | EGLE Part 201 Generic Cleanup Criteria           |                                                     |                                                              |                                                                                                |                                                                                                   |                         | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                                         |                                            |                                               |                                               |                                                             | Area B      |         |             |         |             |         |             |             |             |         |                     |         |             |         |             |         |
|----------------------------|------------|--------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------|-----------------------------------------------|-----------------------------------------------|-------------------------------------------------------------|-------------|---------|-------------|---------|-------------|---------|-------------|-------------|-------------|---------|---------------------|---------|-------------|---------|-------------|---------|
| Station Name               | CAS Number | [1]<br>Residential<br>Drinking Water<br>Criteria | [2]<br>Nonresidential<br>Drinking Water<br>Criteria | [3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [4]<br>Residential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [5]<br>Nonresidential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [6]<br>Water Solubility | [8]<br>Shallow<br>Groundwater<br>Residential<br>MSSL                        | [9]<br>Shallow<br>Groundwater<br>Nonresidential<br>MSSL | [10]<br>Groundwater<br>Residential<br>MSSL | [11]<br>Groundwater<br>Residential TS<br>MSSL | [12]<br>Groundwater<br>Nonresidential<br>MSSL | [13]<br>Groundwater<br>Nonresidential<br>MSSL <sub>12</sub> | SB-106      |         | SB-107      |         | SB-108      |         | SB-109      |             | SB-110      |         |                     |         | SB-111      |         | SB-112      |         |
| Field Sample ID            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 5386 SB-106 |         | 5387 SB-107 |         | 5388 SB-108 |         | 5389 SB-109 |             | 5390 SB-110 |         | 5390 SB-110 Cleanup |         | 5391 SB-111 |         | 5392 SB-112 |         |
| Sample Date                |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 7/19/1995   |         | 7/19/1995   |         | 7/19/1995   |         | 7/19/1995   |             | 7/19/1995   |         | 7/19/1995           |         | 7/19/1995   |         | 7/19/1995   |         |
| Sample Interval (bgs)      |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | --          |         | --          |         | --          |         | --          |             | --          |         | --                  |         | --          |         | --          |         |
|                            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | Result      | Exceeds | Result      | Exceeds | Result      | Exceeds | Result      | Exceeds     | Result      | Exceeds | Result              | Exceeds | Result      | Exceeds | Result      | Exceeds |
| Organics - VOCs (ug/l)     |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |         |             |         |             |         |             |             |             |         |                     |         |             |         |             |         |
| 1,1,1-TRICHLOROETHANE      | 71-55-6    | 200 (A)                                          | 200 (A)                                             | 89                                                           | 660,000                                                                                        | 1,300,000 (S)                                                                                     | 1,330,000               | 180                                                                         | 500                                                     | 8,600                                      | 8,600                                         | 24,000                                        | 24,000                                                      | NM          | --      | NM          | --      | NM          | --      | NM          | --          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      |
| 1,2,3-TRIMETHYLBENZENE     | 526-73-8   | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | 43 (JT)                                                                     | 67 (JT)                                                 | 800 (JT)                                   | 2,400 (JT)                                    | 2,300 (JT)                                    | 4,700 (JT)                                                  | NM          | --      | NM          | --      | NM          | --      | NM          | --          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      |
| 1,2,4-TRIMETHYLBENZENE     | 95-63-6    | 63 (E,I)                                         | 63 (E,I)                                            | 17 (I)                                                       | 56,000 (I,S)                                                                                   | 56,000 (I,S)                                                                                      | 55,890 (I)              | 25 (JT)                                                                     | 44 (JT)                                                 | 440 (JT)                                   | 1,300 (JT)                                    | 1,300 (JT)                                    | 2,600 (JT)                                                  | NM          | --      | NM          | --      | NM          | --      | NM          | --          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      |
| 1,3,5-TRIMETHYLBENZENE     | 108-67-8   | 72 (E,I)                                         | 72 (E,I)                                            | 45 (I)                                                       | 61,000 (I,S)                                                                                   | 61,000 (I,S)                                                                                      | 61,150 (I)              | 18 (JT)                                                                     | 30 (JT)                                                 | 310 (JT)                                   | 940 (JT)                                      | 920 (JT)                                      | 1,800 (JT)                                                  | NM          | --      | NM          | --      | NM          | --      | NM          | --          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      |
| 2-METHYLNAPHTHALENE (VOC)  | 91-57-6V   | 260                                              | 750                                                 | 19                                                           | 25,000 (S)                                                                                     | 25,000 (S)                                                                                        | 24,600                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      |
| ACETONE                    | 67-64-1    | 730 (I)                                          | 2100 (I)                                            | 1700 (I)                                                     | 1.0E+9 (D,I,S)                                                                                 | 1.0E+9 (D,I,S)                                                                                    | 1.0E+9 (I)              | 50,000                                                                      | 62,000                                                  | 1.20E+07                                   | 1.20E+07                                      | 2.50E+07                                      | 2.50E+07                                                    | NM          | --      | NM          | --      | NM          | --      | NM          | --          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      |
| BENZENE                    | 71-43-2    | 5.0 (A,I)                                        | 5.0 (A,I)                                           | 12 (I,X)                                                     | 5,600 (I)                                                                                      | 35,000 (I)                                                                                        | 1,750,000 (I)           | 1                                                                           | 2.7                                                     | 14                                         | 82                                            | 66                                            | 130                                                         | <5 U        | --      | <5 U        | --      | <5 U        | --      | 7           | [1,2,8,9]   | <5 U        | --      | NM                  | --      | <5 U        | --      | <5 U        | --      |
| CYCLOHEXANE                | 110-82-7   | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      |
| ETHYLBENZENE               | 100-41-4   | 74 (E,I)                                         | 74 (E,I)                                            | 18 (I)                                                       | 110,000 (I)                                                                                    | 170,000 (I,S)                                                                                     | 169,000 (I)             | 2.8                                                                         | 7.6                                                     | 45                                         | 450                                           | 210                                           | 420                                                         | <1 U        | --      | <1 U        | --      | 3.0         | [8]     | 71          | [3,8,9,10]  | 2           | --      | NM                  | --      | <1 U        | --      | <1 U        | --      |
| HEXANE                     | 110-54-3   | 3,000                                            | 8,600                                               | NA                                                           | 12,000 (S)                                                                                     | 12,000 (S)                                                                                        | 12,000                  | 29                                                                          | 85                                                      | 29 (GW)                                    | 33                                            | 85 (GW)                                       | 170 (GW)                                                    | NM          | --      | NM          | --      | NM          | --      | NM          | --          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      |
| ISOPROPYLBENZENE           | 98-82-8    | 800                                              | 2,300                                               | 28                                                           | 56,000 (S)                                                                                     | 56,000 (S)                                                                                        | 56,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      |
| M,P-XYLENE                 | 1330-20-7  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      |
| NAPHTHALENE (VOC)          | 91-20-3V   | 520                                              | 1,500                                               | 11                                                           | 31,000 (S)                                                                                     | 31,000 (S)                                                                                        | 31,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      |
| N-PROPYLBENZENE            | 103-65-1   | 80 (I)                                           | 230 (I)                                             | ID                                                           | ID                                                                                             | ID                                                                                                | NA                      | 43                                                                          | 83                                                      | 4100                                       | 12000                                         | 8100                                          | 8100                                                        | NM          | --      | NM          | --      | NM          | --      | NM          | --          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      |
| O-XYLENE                   | 95-47-6    | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      |
| TETRACHLOROETHYLENE        | 127-18-4   | 5.0 (A)                                          | 5.0 (A)                                             | 11 (X)                                                       | 25,000                                                                                         | 170,000                                                                                           | 200,000                 | 1.5                                                                         | 3                                                       | 96                                         | 96                                            | 190                                           | 380                                                         | NM          | --      | NM          | --      | NM          | --      | NM          | --          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      |
| TOLUENE                    | 108-88-3   | 790 (E,I)                                        | 790 (E,I)                                           | 270 (I)                                                      | 530,000 (I,S)                                                                                  | 530,000 (I,S)                                                                                     | 526,000 (I)             | 300                                                                         | 570                                                     | 23,000                                     | 33,000                                        | 66,000                                        | 66,000                                                      | <1 U        | --      | <1 U        | --      | <1 U        | --      | 7           | --          | 2           | --      | NM                  | --      | 1           | --      | <1 U        | --      |
| TRICHLOROETHYLENE          | 79-01-6    | 5.0 (A)                                          | 5.0 (A)                                             | 29 (X)                                                       | 2,200                                                                                          | 4,900                                                                                             | 1,100,000               | 0.073 (M)                                                                   | 0.14 (M)                                                | 6.1                                        | 18                                            | 12                                            | 24                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      |
| XYLENE - TOTAL             | 1330-20-7  | 280 (E,I)                                        | 280 (E,I)                                           | 49 (I)                                                       | 190,000 (I,S)                                                                                  | 190,000 (I,S)                                                                                     | 186,000 (I)             | 75 (J)                                                                      | 120 (J)                                                 | 1,200 (J)                                  | 3,600 (J)                                     | 3,500 (J)                                     | 7,100 (J)                                                   | <3 U        | --      | <3 U        | --      | 19          | --      | 380         | [1,2,3,8,9] | 12          | --      | NM                  | --      | NM          | --      | NM          | --      |
| Other                      |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |         |             |         |             |         |             |             |             |         |                     |         |             |         |             |         |
| CHLORIDE (mg/l)            | 16887-00-6 | 250,000 (E)                                      | 250,000 (E)                                         | 50 (FF)                                                      | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      |
| NITROGEN (mg/l)            | 7727-37-9  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      |
| HYDROCARBONS, TOTAL (mg/l) | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      |
| Water Quality Parameters   |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |         |             |         |             |         |             |             |             |         |                     |         |             |         |             |         |
| TEMPERATURE (°C)           | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      |
| CONDUCTIVITY (mS/cm)       | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      |
| DISSOLVED OXYGEN (%)       | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      |
| pH                         | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      |
| TURBIDITY (nTu)            | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      |

Note: Analytical and Criteria Footnotes are included on the last page of the table.



TABLE 6-2  
Summary of Groundwater Analytical Results  
Area B  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code                      |            | EGLE Part 201 Generic Cleanup Criteria           |                                                     |                                                              |                                                                                                |                                                                                                   |                         | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                                         |                                            |                                               |                                               |                                                             |             | Area B  |                     |         |             |         |             |         |             |             |             |         |             |         |
|------------------------------------|------------|--------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------|-----------------------------------------------|-----------------------------------------------|-------------------------------------------------------------|-------------|---------|---------------------|---------|-------------|---------|-------------|---------|-------------|-------------|-------------|---------|-------------|---------|
| Station Name                       | CAS Number | [1]<br>Residential<br>Drinking Water<br>Criteria | [2]<br>Nonresidential<br>Drinking Water<br>Criteria | [3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [4]<br>Residential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [5]<br>Nonresidential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [6]<br>Water Solubility | [8]<br>Shallow<br>Groundwater<br>Residential<br>MSSL                        | [9]<br>Shallow<br>Groundwater<br>Nonresidential<br>MSSL | [10]<br>Groundwater<br>Residential<br>MSSL | [11]<br>Groundwater<br>Residential TS<br>MSSL | [12]<br>Groundwater<br>Nonresidential<br>MSSL | [13]<br>Groundwater<br>Nonresidential<br>MSSL <sub>12</sub> | SB-114      |         |                     |         | SB-201      |         | SB-501      |         | MW-101      |             | MW-102      |         | MW-103      |         |
| Field Sample ID                    |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 5411 SB-114 |         | 5411 SB-114 Cleanup |         | 5409 SB-201 |         | 5407 SB-501 |         | 5417 MW-101 |             | 5418 MW-102 |         | 5419 MW-103 |         |
| Sample Date                        |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 7/19/1995   |         | 7/19/1995           |         | 7/20/1995   |         | 7/20/1995   |         | 7/25/1995   |             | 7/25/1995   |         | 7/25/1995   |         |
| Sample Interval (bgs)              |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | --          |         | --                  |         | --          |         | --          |         | --          |             | --          |         | --          |         |
|                                    |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | Result      | Exceeds | Result              | Exceeds | Result      | Exceeds | Result      | Exceeds | Result      | Exceeds     | Result      | Exceeds | Result      | Exceeds |
| Inorganics - Metals (ug/l)         |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |         |                     |         |             |         |             |         |             |             |             |         |             |         |
| ARSENIC                            | 7440-38-2  | 10 (A)                                           | 10 (A)                                              | 10                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --          | NM          | --      | NM          | --      |
| BARIUM                             | 7440-39-3  | 2,000 (A,B)                                      | 2,000 (A,B)                                         | 200 (B,G)                                                    | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --          | NM          | --      | NM          | --      |
| CADMIUM                            | 7440-43-9  | 5.0 (A,B)                                        | 5.0 (A,B)                                           | 1.3 (B,G,X)                                                  | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM                  | --      | 1.0         | --      | NM          | --      | NM          | --          | NM          | --      | NM          | --      |
| CALCIUM                            | 7440-70-2  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --          | NM          | --      | NM          | --      |
| CHROMIUM                           | 7440-47-3  | 100 (A,B,H)                                      | 100 (A,B,H)                                         | 40 (B,G,H,X)                                                 | NA                                                                                             | NLV                                                                                               | NLV                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM                  | --      | 130         | [1,2,3] | NM          | --      | NM          | --          | NM          | --      | NM          | --      |
| COPPER                             | 7440-50-8  | 4.0 (B,E)                                        | 4.0 (B,E)                                           | 14 (B,G)                                                     | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --          | NM          | --      | NM          | --      |
| LEAD                               | 7439-92-1  | 4.0 (B,L)                                        | 4.0 (B,L)                                           | 14 (B,G,X)                                                   | NVL                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 0.029       | --      | NM                  | --      | 0.003       | --      | NM          | --      | 0.003       | --          | <0.003 U    | --      | <0.003 U    | --      |
| MAGNESIUM                          | 7439-95-4  | 400,000 (B)                                      | 1,100,000 (B)                                       | NA                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --          | NM          | --      | NM          | --      |
| MANGANESE                          | 7439-96-5  | 50 (B,E)                                         | 50 (B,E)                                            | 1,000 (B,G,X)                                                | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --          | NM          | --      | NM          | --      |
| MERCURY                            | 7439-97-6  | 2.0 (A,B,Z)                                      | 2.0 (A,B,Z)                                         | 0.0013 (B,Z)                                                 | 56 (B,S,Z)                                                                                     | 56 (B,S,Z)                                                                                        | 56 (B,Z)                | 0.088                                                                       | 0.14                                                    | 1.4                                        | 4.3                                           | 4.3                                           | 8.5                                                         | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --          | NM          | --      | NM          | --      |
| POTASSIUM                          | 7440-09-7  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --          | NM          | --      | NM          | --      |
| SELENIUM                           | 7782-49-2  | 50 (A,B)                                         | 50 (A,B)                                            | 5 (B)                                                        | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --          | NM          | --      | NM          | --      |
| SILVER                             | 7440-22-4  | 34 (B)                                           | 98 (B)                                              | 0.2 (B,M)                                                    | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --          | NM          | --      | NM          | --      |
| SODIUM                             | 7440-23-5  | 230,000 (HH)                                     | 350,000                                             | NA                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --          | NM          | --      | NM          | --      |
| STRONTIUM                          | 7440-24-6  | 4,600 (B)                                        | 13,000 (B)                                          | 21,000 (B)                                                   | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --          | NM          | --      | NM          | --      |
| ZINC                               | 7440-66-6  | 2,400 (B)                                        | 5,000 (B,E)                                         | 63 (B,G)                                                     | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --          | NM          | --      | NM          | --      |
| Organics - PCBs as Aroclors (ug/l) |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |         |                     |         |             |         |             |         |             |             |             |         |             |         |
| TOTAL PCBs                         | 1336-36-6  | 0.5 (A,J,T)                                      | 0.5 (A,J,T)                                         | 0.2 (J,M,T)                                                  | 45 (J,S,T)                                                                                     | 45 (J,S,T)                                                                                        | 44.7 (J,T)              | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM                  | --      | ND          | --      | NM          | --      | NM          | --          | NM          | --      | NM          | --      |
| Organics - SVOCs (ug/l)            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |         |                     |         |             |         |             |         |             |             |             |         |             |         |
| 2-METHYLNAPHTHALENE (SVOC)         | 91-57-6S   | 260                                              | 750                                                 | 19                                                           | 25,000 (S)                                                                                     | 25,000 (S)                                                                                        | 24,600                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM                  | --      | NM          | --      | NM          | --      | NM          | --          | NM          | --      | NM          | --      |
| ACENAPHTHENE                       | 83-32-9    | 1,300                                            | 3,800                                               | 38                                                           | 4,200 (S)                                                                                      | 4,200 (S)                                                                                         | 4,240                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <25 U       | --      | <5 UJ               | --      | <5 U        | --      | NM          | --      | 35          | --          | <5 U        | --      | <5 U        | --      |
| ACENAPHTHYLENE                     | 208-96-8   | 52                                               | 150                                                 | ID                                                           | 3,900 (S)                                                                                      | 3,900 (S)                                                                                         | 3,930                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <25 U       | --      | <5 UJ               | --      | <5 U        | --      | NM          | --      | <25 U       | --          | <5 U        | --      | <5 U        | --      |
| ANTHRACENE                         | 120-12-7   | 43 (S)                                           | 43 (S)                                              | ID                                                           | 43 (S)                                                                                         | 43 (S)                                                                                            | 43.4                    | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <25 U       | --      | <5 UJ               | --      | <5 U        | --      | NM          | --      | 71          | [1,2,4,5,6] | <5 U        | --      | <5 U        | --      |
| BENZO(A)ANTHRACENE                 | 56-55-3    | 2.1 (Q)                                          | 8.5 (Q)                                             | ID                                                           | NLV                                                                                            | NLV                                                                                               | 9.4 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <25 U       | --      | <5 UJ               | --      | <5 U        | --      | NM          | --      | <25 U       | --          | <5 U        | --      | <5 U        | --      |
| BENZO(A)PYRENE                     | 50-32-8    | 5.0 (A,Q)                                        | 5.0 (A,Q)                                           | ID                                                           | NLV                                                                                            | NLV                                                                                               | 1.62 (Q)                | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <25 U       | --      | <5 UJ               | --      | <5 U        | --      | NM          | --      | <25 U       | --          | <5 U        | --      | <5 U        | --      |
| BENZO(B)FLUORANTHENE               | 205-99-2   | 1.5 (Q,S,AA)                                     | 1.5 (Q,S,AA)                                        | ID                                                           | ID                                                                                             | ID                                                                                                | 1.5 (Q,AA)              | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <25 U       | --      | <5 UJ               | --      | <5 U        | --      | NM          | --      | <25 U       | --          | <5 U        | --      | <5 U        | --      |
| BENZO(G,H,I)PERYLENE               | 191-24-2   | 1.0 (M)                                          | 1.0 (M)                                             | ID                                                           | NLV                                                                                            | NLV                                                                                               | 0.26                    | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <25 U       | --      | <5 UJ               | --      | <5 U        | --      | NM          | --      | <25 U       | --          | <5 U        | --      | <5 U        | --      |
| BENZO(K)FLUORANTHENE               | 207-08-9   | 1.0 (M,Q)                                        | 1.0 (M,Q)                                           | NA                                                           | NLV                                                                                            | NLV                                                                                               | 0.8 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <25 U       | --      | <5 UJ               | --      | <5 U        | --      | NM          | --      | <25 U       | --          | <5 U        | --      | <5 U        | --      |
| CHRYSENE                           | 218-01-9   | 1.6 (Q,S)                                        | 1.6 (Q,S)                                           | ID                                                           | ID                                                                                             | ID                                                                                                | 1.6 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <25 U       | --      | <5 UJ               | --      | <5 U        | --      | NM          | --      | <25 U       | --          | <5 U        | --      | <5 U        | --      |
| FLUORANTHENE                       | 206-44-0   | 210 (S)                                          | 210 (S)                                             | 1.6                                                          | 210 (S)                                                                                        | 210 (S)                                                                                           | 206                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <25 U       | --      | <5 UJ               | --      | <5 U        | --      | NM          | --      | 40          | [3]         | <5 U        | --      | <5 U        | --      |
| FLUORENE                           | 86-73-7    | 880                                              | 2,000 (S)                                           | 12                                                           | 2,000 (S)                                                                                      | 2,000 (S)                                                                                         | 1,980                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <25 U       | --      | <5 UJ               | --      | <5 U        | --      | NM          | --      | 41          | [3]         | <5 U        | --      | <5 U        | --      |
| INDENO(1,2,3-CD)PYRENE             | 193-39-5   | 2.0 (M,Q)                                        | 2.0 (M,Q)                                           | ID                                                           | NLV                                                                                            | NLV                                                                                               | 0.022 (Q)               | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <25 U       | --      | <5 UJ               | --      | <5 U        | --      | NM          | --      | <25 U       | --          | <5 U        | --      | <5 U        | --      |
| NAPHTHALENE (SVOC)                 | 91-20-3S   | 520                                              | 1,500                                               | 11                                                           | 31,000 (S)                                                                                     | 31,000 (S)                                                                                        | 31,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <25 U       | --      | <5 UJ               | --      | <5 U        | --      | NM          | --      | 280         | [3]         | <5 U        | --      | <5 U        | --      |
| PENTACHLOROPHENOL                  | 87-86-5    | 1.0 (A)                                          | 1.0 (A)                                             | 1.8 (G,X)                                                    | NLV                                                                                            | NLV                                                                                               | 1.85E+06                | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM                  | --      | --          | --      | NM          | --      | NM          | --          | NM          | --      | NM          | --      |
| PHENANTHRENE                       | 85-01-8    | 52                                               | 150                                                 | 2.0 (M)                                                      | 1,000 (S)                                                                                      | 1,000 (S)                                                                                         | 1,000                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <25 U       | --      | <5 UJ               | --      | <5 U        | --      | NM          | --      | <25 U       | --          | <5 U        | --      | <5 U        | --      |
| PYRENE                             | 129-00-0   | 140 (S)                                          | 140 (S)                                             | ID                                                           | 140 (S)                                                                                        | 140 (S)                                                                                           | 135                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <25 U       | --      | <5 UJ               | --      | <5 U        | --      | NM          | --      | 40          | --          | 5           | --      | <5 U        | --      |

Note: Analytical and Criteria Footnotes are included on the last page of the table.



TABLE 6-2  
Summary of Groundwater Analytical Results  
Area B  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code              |            | EGLE Part 201 Generic Cleanup Criteria           |                                                     |                                                              |                                                                                                |                                                                                                   |                         | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                                         |                                            |                                               |                                               |                                                             | Area B      |             |                     |         |             |                |             |         |             |         |             |         |             |           |
|----------------------------|------------|--------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------|-----------------------------------------------|-----------------------------------------------|-------------------------------------------------------------|-------------|-------------|---------------------|---------|-------------|----------------|-------------|---------|-------------|---------|-------------|---------|-------------|-----------|
| Station Name               | CAS Number | [1]<br>Residential<br>Drinking Water<br>Criteria | [2]<br>Nonresidential<br>Drinking Water<br>Criteria | [3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [4]<br>Residential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [5]<br>Nonresidential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [6]<br>Water Solubility | [8]<br>Shallow<br>Groundwater<br>Residential<br>MSSL                        | [9]<br>Shallow<br>Groundwater<br>Nonresidential<br>MSSL | [10]<br>Groundwater<br>Residential<br>MSSL | [11]<br>Groundwater<br>Residential TS<br>MSSL | [12]<br>Groundwater<br>Nonresidential<br>MSSL | [13]<br>Groundwater<br>Nonresidential<br>MSSL <sub>12</sub> | SB-114      |             |                     |         | SB-201      |                | SB-501      |         | MW-101      |         | MW-102      |         | MW-103      |           |
| Field Sample ID            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 5411 SB-114 |             | 5411 SB-114 Cleanup |         | 5409 SB-201 |                | 5407 SB-501 |         | 5417 MW-101 |         | 5418 MW-102 |         | 5419 MW-103 |           |
| Sample Date                |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 7/19/1995   |             | 7/19/1995           |         | 7/20/1995   |                | 7/20/1995   |         | 7/25/1995   |         | 7/25/1995   |         | 7/25/1995   |           |
| Sample Interval (bgs)      |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | --          |             | --                  |         | --          |                | --          |         | --          |         | --          |         | --          |           |
|                            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | Result      | Exceeds     | Result              | Exceeds | Result      | Exceeds        | Result      | Exceeds | Result      | Exceeds | Result      | Exceeds | Result      | Exceeds   |
| Organics - VOCs (ug/l)     |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |             |                     |         |             |                |             |         |             |         |             |         |             |           |
| 1,1,1-TRICHLOROETHANE      | 71-55-6    | 200 (A)                                          | 200 (A)                                             | 89                                                           | 660,000                                                                                        | 1,300,000 (S)                                                                                     | 1,330,000               | 180                                                                         | 500                                                     | 8,600                                      | 8,600                                         | 24,000                                        | 24,000                                                      | NM          | --          | NM                  | --      | <1 U        | --             | <1 U        | --      | NM          | --      | NM          | --      | NM          | --        |
| 1,2,3-TRIMETHYLBENZENE     | 526-73-8   | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | 43 (JT)                                                                     | 67 (JT)                                                 | 800 (JT)                                   | 2,400 (JT)                                    | 2,300 (JT)                                    | 4,700 (JT)                                                  | NM          | --          | NM                  | --      | NM          | --             | NM          | --      | NM          | --      | NM          | --      | NM          | --        |
| 1,2,4-TRIMETHYLBENZENE     | 95-63-6    | 63 (E,I)                                         | 63 (E,I)                                            | 17 (I)                                                       | 56,000 (I,S)                                                                                   | 56,000 (I,S)                                                                                      | 55,890 (I)              | 25 (JT)                                                                     | 44 (JT)                                                 | 440 (JT)                                   | 1,300 (JT)                                    | 1,300 (JT)                                    | 2,600 (JT)                                                  | NM          | --          | NM                  | --      | NM          | --             | NM          | --      | NM          | --      | NM          | --      | NM          | --        |
| 1,3,5-TRIMETHYLBENZENE     | 108-67-8   | 72 (E,I)                                         | 72 (E,I)                                            | 45 (I)                                                       | 61,000 (I,S)                                                                                   | 61,000 (I,S)                                                                                      | 61,150 (I)              | 18 (JT)                                                                     | 30 (JT)                                                 | 310 (JT)                                   | 940 (JT)                                      | 920 (JT)                                      | 1,800 (JT)                                                  | NM          | --          | NM                  | --      | NM          | --             | NM          | --      | NM          | --      | NM          | --      | NM          | --        |
| 2-METHYLNAPHTHALENE (VOC)  | 91-57-6V   | 260                                              | 750                                                 | 19                                                           | 25,000 (S)                                                                                     | 25,000 (S)                                                                                        | 24,600                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --          | NM                  | --      | NM          | --             | NM          | --      | NM          | --      | NM          | --      | NM          | --        |
| ACETONE                    | 67-64-1    | 730 (I)                                          | 2100 (I)                                            | 1700 (I)                                                     | 1.0E+9 (D,I,S)                                                                                 | 1.0E+9 (D,I,S)                                                                                    | 1.0E+9 (I)              | 50,000                                                                      | 62,000                                                  | 1.20E+07                                   | 1.20E+07                                      | 2.50E+07                                      | 2.50E+07                                                    | NM          | --          | NM                  | --      | NM          | --             | NM          | --      | NM          | --      | NM          | --      | NM          | --        |
| BENZENE                    | 71-43-2    | 5.0 (A,I)                                        | 5.0 (A,I)                                           | 12 (I,X)                                                     | 5,600 (I)                                                                                      | 35,000 (I)                                                                                        | 1,750,000 (I)           | 1                                                                           | 2.7                                                     | 14                                         | 82                                            | 66                                            | 130                                                         | 13          | [1,2,3,8,9] | NM                  | --      | 35          | [1,2,3,8,9,10] | NM          | --      | <5 U        | --      | <5 U        | --      | 9           | [1,2,8,9] |
| CYCLOHEXANE                | 110-82-7   | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --          | NM                  | --      | NM          | --             | NM          | --      | NM          | --      | NM          | --      | NM          | --        |
| ETHYLBENZENE               | 100-41-4   | 74 (E,I)                                         | 74 (E,I)                                            | 18 (I)                                                       | 110,000 (I)                                                                                    | 170,000 (I,S)                                                                                     | 169,000 (I)             | 2.8                                                                         | 7.6                                                     | 45                                         | 450                                           | 210                                           | 420                                                         | 12          | [8,9]       | NM                  | --      | 24          | [3,8,9]        | NM          | --      | 11          | [8,9]   | <1 U        | --      | 2           | --        |
| HEXANE                     | 110-54-3   | 3,000                                            | 8,600                                               | NA                                                           | 12,000 (S)                                                                                     | 12,000 (S)                                                                                        | 12,000                  | 29                                                                          | 85                                                      | 29 (GW)                                    | 33                                            | 85 (GW)                                       | 170 (GW)                                                    | NM          | --          | NM                  | --      | NM          | --             | NM          | --      | NM          | --      | NM          | --      | NM          | --        |
| ISOPROPYLBENZENE           | 98-82-8    | 800                                              | 2,300                                               | 28                                                           | 56,000 (S)                                                                                     | 56,000 (S)                                                                                        | 56,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --          | NM                  | --      | NM          | --             | NM          | --      | NM          | --      | NM          | --      | NM          | --        |
| M,P-XYLENE                 | 1330-20-7  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --          | NM                  | --      | NM          | --             | NM          | --      | NM          | --      | NM          | --      | NM          | --        |
| NAPHTHALENE (VOC)          | 91-20-3V   | 520                                              | 1,500                                               | 11                                                           | 31,000 (S)                                                                                     | 31,000 (S)                                                                                        | 31,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --          | NM                  | --      | NM          | --             | NM          | --      | NM          | --      | NM          | --      | NM          | --        |
| N-PROPYLBENZENE            | 103-65-1   | 80 (I)                                           | 230 (I)                                             | ID                                                           | ID                                                                                             | ID                                                                                                | NA                      | 43                                                                          | 83                                                      | 4100                                       | 12000                                         | 8100                                          | 8100                                                        | NM          | --          | NM                  | --      | NM          | --             | NM          | --      | NM          | --      | NM          | --      | NM          | --        |
| O-XYLENE                   | 95-47-6    | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --          | NM                  | --      | NM          | --             | NM          | --      | NM          | --      | NM          | --      | NM          | --        |
| TETRACHLOROETHYLENE        | 127-18-4   | 5.0 (A)                                          | 5.0 (A)                                             | 11 (X)                                                       | 25,000                                                                                         | 170,000                                                                                           | 200,000                 | 1.5                                                                         | 3                                                       | 96                                         | 96                                            | 190                                           | 380                                                         | NM          | --          | NM                  | --      | <1 U        | --             | <1 U        | --      | NM          | --      | NM          | --      | NM          | --        |
| TOLUENE                    | 108-88-3   | 790 (E,I)                                        | 790 (E,I)                                           | 270 (I)                                                      | 530,000 (I,S)                                                                                  | 530,000 (I,S)                                                                                     | 526,000 (I)             | 300                                                                         | 570                                                     | 23,000                                     | 33,000                                        | 66,000                                        | 66,000                                                      | 2           | --          | NM                  | --      | 40          | --             | NM          | --      | 2           | --      | <1 U        | --      | 3           | --        |
| TRICHLOROETHYLENE          | 79-01-6    | 5.0 (A)                                          | 5.0 (A)                                             | 29 (X)                                                       | 2,200                                                                                          | 4,900                                                                                             | 1,100,000               | 0.073 (M)                                                                   | 0.14 (M)                                                | 6.1                                        | 18                                            | 12                                            | 24                                                          | NM          | --          | NM                  | --      | <1 U        | --             | <1 U        | --      | NM          | --      | NM          | --      | NM          | --        |
| XYLENE - TOTAL             | 1330-20-7  | 280 (E,I)                                        | 280 (E,I)                                           | 49 (I)                                                       | 190,000 (I,S)                                                                                  | 190,000 (I,S)                                                                                     | 186,000 (I)             | 75 (J)                                                                      | 120 (J)                                                 | 1,200 (J)                                  | 3,600 (J)                                     | 3,500 (J)                                     | 7,100 (J)                                                   | 42          | --          | NM                  | --      | 92          | [3,8]          | NM          | --      | 60          | [3]     | <3 U        | --      | 11          | --        |
| Other                      |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |             |                     |         |             |                |             |         |             |         |             |         |             |           |
| CHLORIDE (mg/l)            | 16887-00-6 | 250,000 (E)                                      | 250,000 (E)                                         | 50 (FF)                                                      | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --          | NM                  | --      | NM          | --             | NM          | --      | NM          | --      | NM          | --      | NM          | --        |
| NITROGEN (mg/l)            | 7727-37-9  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --          | NM                  | --      | NM          | --             | NM          | --      | NM          | --      | NM          | --      | NM          | --        |
| HYDROCARBONS, TOTAL (mg/l) | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --          | NM                  | --      | NM          | --             | NM          | --      | NM          | --      | NM          | --      | NM          | --        |
| Water Quality Parameters   |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |             |                     |         |             |                |             |         |             |         |             |         |             |           |
| TEMPERATURE (°C)           | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --          | NM                  | --      | NM          | --             | NM          | --      | NM          | --      | NM          | --      | NM          | --        |
| CONDUCTIVITY (mS/cm)       | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --          | NM                  | --      | NM          | --             | NM          | --      | NM          | --      | NM          | --      | NM          | --        |
| DISSOLVED OXYGEN (%)       | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --          | NM                  | --      | NM          | --             | NM          | --      | NM          | --      | NM          | --      | NM          | --        |
| pH                         | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --          | NM                  | --      | NM          | --             | NM          | --      | NM          | --      | NM          | --      | NM          | --        |
| TURBIDITY (nTu)            | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --          | NM                  | --      | NM          | --             | NM          | --      | NM          | --      | NM          | --      | NM          | --        |

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 6-2  
Summary of Groundwater Analytical Results  
Area B  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code                      |            | EGLE Part 201 Generic Cleanup Criteria           |                                                     |                                                              |                                                                                                |                                                                                                   |                         | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                                         |                                            |                                               |                                               |                                                             | Area B      |         |             |         |             |         |             |         |             |         |             |         |             |         |
|------------------------------------|------------|--------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------|-----------------------------------------------|-----------------------------------------------|-------------------------------------------------------------|-------------|---------|-------------|---------|-------------|---------|-------------|---------|-------------|---------|-------------|---------|-------------|---------|
| Station Name                       | CAS Number | [1]<br>Residential<br>Drinking Water<br>Criteria | [2]<br>Nonresidential<br>Drinking Water<br>Criteria | [3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [4]<br>Residential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [5]<br>Nonresidential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [6]<br>Water Solubility | [8]<br>Shallow<br>Groundwater<br>Residential<br>MSSL                        | [9]<br>Shallow<br>Groundwater<br>Nonresidential<br>MSSL | [10]<br>Groundwater<br>Residential<br>MSSL | [11]<br>Groundwater<br>Residential TS<br>MSSL | [12]<br>Groundwater<br>Nonresidential<br>MSSL | [13]<br>Groundwater<br>Nonresidential<br>MSSL <sub>12</sub> | MW-104      |         | MW-105      |         | MW-106      |         | MW-108      |         | MW-109      |         | MW-110      |         | MW-112      |         |
| Field Sample ID                    |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 5420 MW-104 |         | 8795 MW-105 |         | 8775 MW-106 |         | 8777 MW-108 |         | 8778 MW-109 |         | 8779 MW-110 |         | 8781 MW-112 |         |
| Sample Date                        |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 7/25/1995   |         | 10/29/1996  |         | 10/11/1996  |         | 10/11/1996  |         | 10/11/1996  |         | 10/11/1996  |         |             |         |
| Sample Interval (bgs)              |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | --          |         | --          |         | --          |         | --          |         | --          |         | --          |         |             |         |
|                                    |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | Result      | Exceeds | Result      | Exceeds | Result      | Exceeds | Result      | Exceeds | Result      | Exceeds | Result      | Exceeds | Result      | Exceeds |
| Inorganics - Metals (ug/l)         |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |         |             |         |             |         |             |         |             |         |             |         |             |         |
| ARSENIC                            | 7440-38-2  | 10 (A)                                           | 10 (A)                                              | 10                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| BARIUM                             | 7440-39-3  | 2,000 (A,B)                                      | 2,000 (A,B)                                         | 200 (B,G)                                                    | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| CADMIUM                            | 7440-43-9  | 5.0 (A,B)                                        | 5.0 (A,B)                                           | 1.3 (B,G,X)                                                  | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| CALCIUM                            | 7440-70-2  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| CHROMIUM                           | 7440-47-3  | 100 (A,B,H)                                      | 100 (A,B,H)                                         | 40 (B,G,H,X)                                                 | NA                                                                                             | NLV                                                                                               | NLV                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| COPPER                             | 7440-50-8  | 4.0 (B,E)                                        | 4.0 (B,E)                                           | 14 (B,G)                                                     | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| LEAD                               | 7439-92-1  | 4.0 (B,L)                                        | 4.0 (B,L)                                           | 14 (B,G,X)                                                   | NVL                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 0.006       | --      | 160         | [1,2,3] | 6.0         | [1,2]   | <3 U        | --      | <3 U        | --      | <3 U        | --      | <3 U        | --      |
| MAGNESIUM                          | 7439-95-4  | 400,000 (B)                                      | 1,100,000 (B)                                       | NA                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| MANGANESE                          | 7439-96-5  | 50 (B,E)                                         | 50 (B,E)                                            | 1,000 (B,G,X)                                                | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| MERCURY                            | 7439-97-6  | 2.0 (A,B,Z)                                      | 2.0 (A,B,Z)                                         | 0.0013 (B,Z)                                                 | 56 (B,S,Z)                                                                                     | 56 (B,S,Z)                                                                                        | 56 (B,Z)                | 0.088                                                                       | 0.14                                                    | 1.4                                        | 4.3                                           | 4.3                                           | 8.5                                                         | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| POTASSIUM                          | 7440-09-7  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| SELENIUM                           | 7782-49-2  | 50 (A,B)                                         | 50 (A,B)                                            | 5 (B)                                                        | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| SILVER                             | 7440-22-4  | 34 (B)                                           | 98 (B)                                              | 0.2 (B,M)                                                    | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| SODIUM                             | 7440-23-5  | 230,000 (HH)                                     | 350,000                                             | NA                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| STRONTIUM                          | 7440-24-6  | 4,600 (B)                                        | 13,000 (B)                                          | 21,000 (B)                                                   | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| ZINC                               | 7440-66-6  | 2,400 (B)                                        | 5,000 (B,E)                                         | 63 (B,G)                                                     | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| Organics - PCBs as Aroclors (ug/l) |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |         |             |         |             |         |             |         |             |         |             |         |             |         |
| TOTAL PCBs                         | 1336-36-6  | 0.5 (A,J,T)                                      | 0.5 (A,J,T)                                         | 0.2 (J,M,T)                                                  | 45 (J,S,T)                                                                                     | 45 (J,S,T)                                                                                        | 44.7 (J,T)              | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| Organics - SVOCs (ug/l)            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |         |             |         |             |         |             |         |             |         |             |         |             |         |
| 2-METHYLNAPHTHALENE (SVOC)         | 91-57-6S   | 260                                              | 750                                                 | 19                                                           | 25,000 (S)                                                                                     | 25,000 (S)                                                                                        | 24,600                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| ACENAPHTHENE                       | 83-32-9    | 1,300                                            | 3,800                                               | 38                                                           | 4,200 (S)                                                                                      | 4,200 (S)                                                                                         | 4,240                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | <5 U        | --      | 16          | --      | <5 U        | --      | 6           | --      | <25 U       | --      | <5 U        | --      |
| ACENAPHTHYLENE                     | 208-96-8   | 52                                               | 150                                                 | ID                                                           | 3,900 (S)                                                                                      | 3,900 (S)                                                                                         | 3,930                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | <5 U        | --      | 8           | --      | <5 U        | --      | <5 U        | --      | <25 U       | --      | <5 U        | --      |
| ANTHRACENE                         | 120-12-7   | 43 (S)                                           | 43 (S)                                              | ID                                                           | 43 (S)                                                                                         | 43 (S)                                                                                            | 43.4                    | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | <5 U        | --      | 5           | --      | <5 U        | --      | 9           | --      | <25 U       | --      | <5 U        | --      |
| BENZO(A)ANTHRACENE                 | 56-55-3    | 2.1 (Q)                                          | 8.5 (Q)                                             | ID                                                           | NLV                                                                                            | NLV                                                                                               | 9.4 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | <5 U        | --      | <5 U        | --      | 11          | [1,2,6] | 24          | [1,2,6] | <25 U       | --      | <5 U        | --      |
| BENZO(A)PYRENE                     | 50-32-8    | 5.0 (A,Q)                                        | 5.0 (A,Q)                                           | ID                                                           | NLV                                                                                            | NLV                                                                                               | 1.62 (Q)                | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | <5 U        | --      | <5 U        | --      | 11          | [1,2,6] | 22          | [1,2,6] | <25 U       | --      | <5 U        | --      |
| BENZO(B)FLUORANTHENE               | 205-99-2   | 1.5 (Q,S,AA)                                     | 1.5 (Q,S,AA)                                        | ID                                                           | ID                                                                                             | ID                                                                                                | 1.5 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | <5 U        | --      | <5 U        | --      | 10          | [1,2,6] | 24          | [1,2,6] | <25 U       | --      | <5 U        | --      |
| BENZO(G,H,I)PERYLENE               | 191-24-2   | 1.0 (M)                                          | 1.0 (M)                                             | ID                                                           | NLV                                                                                            | NLV                                                                                               | 0.26                    | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | <5 U        | --      | <5 U        | --      | 8           | [1,2,6] | 13          | [1,2,6] | <25 U       | --      | <5 U        | --      |
| BENZO(K)FLUORANTHENE               | 207-08-9   | 1.0 (M,Q)                                        | 1.0 (M,Q)                                           | NA                                                           | NLV                                                                                            | NLV                                                                                               | 0.8 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | <5 U        | --      | <5 U        | --      | 8           | [1,2,6] | 18          | [1,2,6] | <25 U       | --      | <5 U        | --      |
| CHRYSENE                           | 218-01-9   | 1.6 (Q,S)                                        | 1.6 (Q,S)                                           | ID                                                           | ID                                                                                             | ID                                                                                                | 1.6 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | <5 U        | --      | <5 U        | --      | 12          | [1,2,6] | 25          | [1,2,6] | <25 U       | --      | <5 U        | --      |
| FLUORANTHENE                       | 206-44-0   | 210 (S)                                          | 210 (S)                                             | 1.6                                                          | 210 (S)                                                                                        | 210 (S)                                                                                           | 206                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | <5 U        | --      | 7           | [3]     | 24          | [3]     | 56          | [3]     | <25 U       | --      | <5 U        | --      |
| FLUORENE                           | 86-73-7    | 880                                              | 2,000 (S)                                           | 12                                                           | 2,000 (S)                                                                                      | 2,000 (S)                                                                                         | 1,980                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | <5 U        | --      | <5 U        | --      | <5 U        | --      | 9           | --      | <25 U       | --      | <5 U        | --      |
| INDENO(1,2,3-CD)PYRENE             | 193-39-5   | 2.0 (M,Q)                                        | 2.0 (M,Q)                                           | ID                                                           | NLV                                                                                            | NLV                                                                                               | 0.022 (Q)               | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | <5 U        | --      | <5 U        | --      | 9           | [1,2,6] | 15          | [1,2,6] | <25 U       | --      | <5 U        | --      |
| NAPHTHALENE (SVOC)                 | 91-20-3S   | 520                                              | 1,500                                               | 11                                                           | 31,000 (S)                                                                                     | 31,000 (S)                                                                                        | 31,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | 5           | --      | 85          | [3]     | <5 U        | --      | 18          | [3]     | 410         | [3]     | 11          | --      |
| PENTACHLOROPHENOL                  | 87-86-5    | 1.0 (A)                                          | 1.0 (A)                                             | 1.8 (G,X)                                                    | NLV                                                                                            | NLV                                                                                               | 1.85E+06                | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| PHENANTHRENE                       | 85-01-8    | 52                                               | 150                                                 | 2.0 (M)                                                      | 1,000 (S)                                                                                      | 1,000 (S)                                                                                         | 1,000                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | <5 U        | --      | 27          | [3]     | 9           | [3]     | 36          | [3]     | 41          | [3]     | 12          | [3]     |
| PYRENE                             | 129-00-0   | 140 (S)                                          | 140 (S)                                             | ID                                                           | 140 (S)                                                                                        | 140 (S)                                                                                           | 135                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | <5 U        | --      | 6           | --      | 19          | --      | 40          | --      | <25 U       | --      | 10          | --      |

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 6-2  
Summary of Groundwater Analytical Results  
Area B  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code              |            | EGLE Part 201 Generic Cleanup Criteria           |                                                     |                                                              |                                                                                                |                                                                                                   |                         | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                                         |                                            |                                               |                                               |                                                             | Area B      |         |             |           |             |             |             |         |             |                |             |                      |             |         |
|----------------------------|------------|--------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------|-----------------------------------------------|-----------------------------------------------|-------------------------------------------------------------|-------------|---------|-------------|-----------|-------------|-------------|-------------|---------|-------------|----------------|-------------|----------------------|-------------|---------|
| Station Name               | CAS Number | [1]<br>Residential<br>Drinking Water<br>Criteria | [2]<br>Nonresidential<br>Drinking Water<br>Criteria | [3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [4]<br>Residential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [5]<br>Nonresidential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [6]<br>Water Solubility | [8]<br>Shallow<br>Groundwater<br>Residential<br>MSSL                        | [9]<br>Shallow<br>Groundwater<br>Nonresidential<br>MSSL | [10]<br>Groundwater<br>Residential<br>MSSL | [11]<br>Groundwater<br>Residential TS<br>MSSL | [12]<br>Groundwater<br>Nonresidential<br>MSSL | [13]<br>Groundwater<br>Nonresidential<br>MSSL <sub>12</sub> | MW-104      |         | MW-105      |           | MW-106      |             | MW-108      |         | MW-109      |                | MW-110      |                      | MW-112      |         |
| Field Sample ID            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 5420 MW-104 |         | 8795 MW-105 |           | 8775 MW-106 |             | 8777 MW-108 |         | 8778 MW-109 |                | 8779 MW-110 |                      | 8781 MW-112 |         |
| Sample Date                |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 7/25/1995   |         | 10/29/1996  |           | 10/11/1996  |             | 10/11/1996  |         | 10/11/1996  |                | 10/11/1996  |                      |             |         |
| Sample Interval (bgs)      |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | --          |         | --          |           | --          |             | --          |         | --          |                | --          |                      |             |         |
|                            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | Result      | Exceeds | Result      | Exceeds   | Result      | Exceeds     | Result      | Exceeds | Result      | Exceeds        | Result      | Exceeds              | Result      | Exceeds |
| Organics - VOCs (ug/l)     |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |         |             |           |             |             |             |         |             |                |             |                      |             |         |
| 1,1,1-TRICHLOROETHANE      | 71-55-6    | 200 (A)                                          | 200 (A)                                             | 89                                                           | 660,000                                                                                        | 1,300,000 (S)                                                                                     | 1,330,000               | 180                                                                         | 500                                                     | 8,600                                      | 8,600                                         | 24,000                                        | 24,000                                                      | NM          | --      | NM          | --        | NM          | --          | NM          | --      | NM          | --             | NM          | --                   | NM          | --      |
| 1,2,3-TRIMETHYLBENZENE     | 526-73-8   | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | 43 (JT)                                                                     | 67 (JT)                                                 | 800 (JT)                                   | 2,400 (JT)                                    | 2,300 (JT)                                    | 4,700 (JT)                                                  | NM          | --      | NM          | --        | NM          | --          | NM          | --      | NM          | --             | NM          | --                   | NM          | --      |
| 1,2,4-TRIMETHYLBENZENE     | 95-63-6    | 63 (E,I)                                         | 63 (E,I)                                            | 17 (I)                                                       | 56,000 (I,S)                                                                                   | 56,000 (I,S)                                                                                      | 55,890 (I)              | 25 (JT)                                                                     | 44 (JT)                                                 | 440 (JT)                                   | 1,300 (JT)                                    | 1,300 (JT)                                    | 2,600 (JT)                                                  | NM          | --      | NM          | --        | NM          | --          | NM          | --      | NM          | --             | NM          | --                   | NM          | --      |
| 1,3,5-TRIMETHYLBENZENE     | 108-67-8   | 72 (E,I)                                         | 72 (E,I)                                            | 45 (I)                                                       | 61,000 (I,S)                                                                                   | 61,000 (I,S)                                                                                      | 61,150 (I)              | 18 (JT)                                                                     | 30 (JT)                                                 | 310 (JT)                                   | 940 (JT)                                      | 920 (JT)                                      | 1,800 (JT)                                                  | NM          | --      | NM          | --        | NM          | --          | NM          | --      | NM          | --             | NM          | --                   | NM          | --      |
| 2-METHYLNAPHTHALENE (VOC)  | 91-57-6V   | 260                                              | 750                                                 | 19                                                           | 25,000 (S)                                                                                     | 25,000 (S)                                                                                        | 24,600                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --        | NM          | --          | NM          | --      | NM          | --             | NM          | --                   | NM          | --      |
| ACETONE                    | 67-64-1    | 730 (I)                                          | 2100 (I)                                            | 1700 (I)                                                     | 1.0E+9 (D,I,S)                                                                                 | 1.0E+9 (D,I,S)                                                                                    | 1.0E+9 (I)              | 50,000                                                                      | 62,000                                                  | 1.20E+07                                   | 1.20E+07                                      | 2.50E+07                                      | 2.50E+07                                                    | NM          | --      | NM          | --        | NM          | --          | NM          | --      | NM          | --             | NM          | --                   | NM          | --      |
| BENZENE                    | 71-43-2    | 5.0 (A,I)                                        | 5.0 (A,I)                                           | 12 (I,X)                                                     | 5,600 (I)                                                                                      | 35,000 (I)                                                                                        | 1,750,000 (I)           | 1                                                                           | 2.7                                                     | 14                                         | 82                                            | 66                                            | 130                                                         | <5 U        | --      | 8           | [1,2,8,9] | 8           | [1,2,8,9]   | <5 U        | --      | 30          | [1,2,3,8,9,10] | 110         | [1,2,3,8,9,10,11,12] | <5 U        | --      |
| CYCLOHEXANE                | 110-82-7   | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --        | NM          | --          | NM          | --      | NM          | --             | NM          | --                   | NM          | --      |
| ETHYLBENZENE               | 100-41-4   | 74 (E,I)                                         | 74 (E,I)                                            | 18 (I)                                                       | 110,000 (I)                                                                                    | 170,000 (I,S)                                                                                     | 169,000 (I)             | 2.8                                                                         | 7.6                                                     | 45                                         | 450                                           | 210                                           | 420                                                         | <1 U        | --      | 28          | [3,8,9]   | 22          | [3,8,9]     | <1 U        | --      | 9.0         | [8,9]          | 430         | [1,2,3,8,9,10,12,13] | <1 U        | --      |
| HEXANE                     | 110-54-3   | 3,000                                            | 8,600                                               | NA                                                           | 12,000 (S)                                                                                     | 12,000 (S)                                                                                        | 12,000                  | 29                                                                          | 85                                                      | 29 (GW)                                    | 33                                            | 85 (GW)                                       | 170 (GW)                                                    | NM          | --      | NM          | --        | NM          | --          | NM          | --      | NM          | --             | NM          | --                   | NM          | --      |
| ISOPROPYLBENZENE           | 98-82-8    | 800                                              | 2,300                                               | 28                                                           | 56,000 (S)                                                                                     | 56,000 (S)                                                                                        | 56,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --        | NM          | --          | NM          | --      | NM          | --             | NM          | --                   | NM          | --      |
| M,P-XYLENE                 | 1330-20-7  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --        | NM          | --          | NM          | --      | NM          | --             | NM          | --                   | NM          | --      |
| NAPHTHALENE (VOC)          | 91-20-3V   | 520                                              | 1,500                                               | 11                                                           | 31,000 (S)                                                                                     | 31,000 (S)                                                                                        | 31,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --        | NM          | --          | NM          | --      | NM          | --             | NM          | --                   | NM          | --      |
| N-PROPYLBENZENE            | 103-65-1   | 80 (I)                                           | 230 (I)                                             | ID                                                           | ID                                                                                             | ID                                                                                                | NA                      | 43                                                                          | 83                                                      | 4100                                       | 12000                                         | 8100                                          | 8100                                                        | NM          | --      | NM          | --        | NM          | --          | NM          | --      | NM          | --             | NM          | --                   | NM          | --      |
| O-XYLENE                   | 95-47-6    | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --        | NM          | --          | NM          | --      | NM          | --             | NM          | --                   | NM          | --      |
| TETRACHLOROETHYLENE        | 127-18-4   | 5.0 (A)                                          | 5.0 (A)                                             | 11 (X)                                                       | 25,000                                                                                         | 170,000                                                                                           | 200,000                 | 1.5                                                                         | 3                                                       | 96                                         | 96                                            | 190                                           | 380                                                         | NM          | --      | NM          | --        | NM          | --          | NM          | --      | NM          | --             | NM          | --                   | NM          | --      |
| TOLUENE                    | 108-88-3   | 790 (E,I)                                        | 790 (E,I)                                           | 270 (I)                                                      | 530,000 (I,S)                                                                                  | 530,000 (I,S)                                                                                     | 526,000 (I)             | 300                                                                         | 570                                                     | 23,000                                     | 33,000                                        | 66,000                                        | 66,000                                                      | <1 U        | --      | 8           | --        | 68          | --          | <1 U        | --      | 21          | --             | 28          | --                   | 1           | --      |
| TRICHLOROETHYLENE          | 79-01-6    | 5.0 (A)                                          | 5.0 (A)                                             | 29 (X)                                                       | 2,200                                                                                          | 4,900                                                                                             | 1,100,000               | 0.073 (M)                                                                   | 0.14 (M)                                                | 6.1                                        | 18                                            | 12                                            | 24                                                          | NM          | --      | NM          | --        | NM          | --          | NM          | --      | NM          | --             | NM          | --                   | NM          | --      |
| XYLENE - TOTAL             | 1330-20-7  | 280 (E,I)                                        | 280 (E,I)                                           | 49 (I)                                                       | 190,000 (I,S)                                                                                  | 190,000 (I,S)                                                                                     | 186,000 (I)             | 75 (J)                                                                      | 120 (J)                                                 | 1,200 (J)                                  | 3,600 (J)                                     | 3,500 (J)                                     | 7,100 (J)                                                   | <3 U        | --      | 72          | [3]       | 500         | [1,2,3,8,9] | <3 U        | --      | 20          | --             | 1,700       | [1,2,3,8,9,10]       | <3 U        | --      |
| Other                      |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |         |             |           |             |             |             |         |             |                |             |                      |             |         |
| CHLORIDE (mg/l)            | 16887-00-6 | 250,000 (E)                                      | 250,000 (E)                                         | 50 (FF)                                                      | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | 720         | [3]       | 100         | [3]         | 20          | --      | 2,000       | [3]            | 400         | [3]                  | 20          | --      |
| NITROGEN (mg/l)            | 7727-37-9  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --        | NM          | --          | NM          | --      | NM          | --             | NM          | --                   | NM          | --      |
| HYDROCARBONS, TOTAL (mg/l) | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --        | NM          | --          | NM          | --      | NM          | --             | NM          | --                   | NM          | --      |
| Water Quality Parameters   |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |         |             |           |             |             |             |         |             |                |             |                      |             |         |
| TEMPERATURE (°C)           | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --        | NM          | --          | NM          | --      | NM          | --             | NM          | --                   | NM          | --      |
| CONDUCTIVITY (mS/cm)       | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --        | NM          | --          | NM          | --      | NM          | --             | NM          | --                   | NM          | --      |
| DISSOLVED OXYGEN (%)       | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --        | NM          | --          | NM          | --      | NM          | --             | NM          | --                   | NM          | --      |
| pH                         | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --        | NM          | --          | NM          | --      | NM          | --             | NM          | --                   | NM          | --      |
| TURBIDITY (nTu)            | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM          | --        | NM          | --          | NM          | --      | NM          | --             | NM          | --                   | NM          | --      |

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 6-2  
Summary of Groundwater Analytical Results  
Area B  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code                      |            | EGLE Part 201 Generic Cleanup Criteria           |                                                     |                                                              |                                                                                                |                                                                                                   |                         | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                                         |                                            |                                               |                                               |                                                             |             | Area B       |             |             |             |              |              |              |             |              |         |         |        |         |        |         |        |         |        |         |
|------------------------------------|------------|--------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------|-----------------------------------------------|-----------------------------------------------|-------------------------------------------------------------|-------------|--------------|-------------|-------------|-------------|--------------|--------------|--------------|-------------|--------------|---------|---------|--------|---------|--------|---------|--------|---------|--------|---------|
| Station Name                       | CAS Number | [1]<br>Residential<br>Drinking Water<br>Criteria | [2]<br>Nonresidential<br>Drinking Water<br>Criteria | [3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [4]<br>Residential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [5]<br>Nonresidential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [6]<br>Water Solubility | [8]<br>Shallow<br>Groundwater<br>Residential<br>MSSL                        | [9]<br>Shallow<br>Groundwater<br>Nonresidential<br>MSSL | [10]<br>Groundwater<br>Residential<br>MSSL | [11]<br>Groundwater<br>Residential TS<br>MSSL | [12]<br>Groundwater<br>Nonresidential<br>MSSL | [13]<br>Groundwater<br>Nonresidential<br>MSSL <sub>12</sub> | MW-301      |              |             |             |             |              |              |              | MW-302      |              |         |         |        |         |        |         | MW-303 |         |        |         |
| Field Sample ID                    |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 5421 MW-301 | MW-301 10141 | QMCP MW-301 | QMCP-MW-301 | 5422 MW-302 | MW-302 10142 | QMCP MW-302  | QMCP-MW-302  | 5423 MW-303 | 8787 MW-303D |         |         |        |         |        |         |        |         |        |         |
| Sample Date                        |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 7/25/1995   | 7/9/1998     | 9/6/2018    | 9/23/2020   | 7/25/1995   | 7/9/1998     | 9/6/2018     | 9/23/2020    | 7/25/1995   | 10/11/1996   |         |         |        |         |        |         |        |         |        |         |
| Sample Interval (bgs)              |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | --          | --           | 30 - 35 ft  | 30 - 35 ft  | --          | --           | 1.7 - 6.7 ft | 1.7 - 6.7 ft | --          | --           |         |         |        |         |        |         |        |         |        |         |
|                                    |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | Result      | Exceeds      | Result      | Exceeds     | Result      | Exceeds      | Result       | Exceeds      | Result      | Exceeds      | Result  | Exceeds | Result | Exceeds | Result | Exceeds | Result | Exceeds | Result | Exceeds |
| Inorganics - Metals (ug/l)         |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |              |             |             |             |              |              |              |             |              |         |         |        |         |        |         |        |         |        |         |
| ARSENIC                            | 7440-38-2  | 10 (A)                                           | 10 (A)                                              | 10                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | <1.0 U      | --           | NM           | --           | NM          | --           | 1.1     | --      | NM     | --      | NM     | --      | NM     | --      |        |         |
| BARIUM                             | 7440-39-3  | 2,000 (A,B)                                      | 2,000 (A,B)                                         | 200 (B,G)                                                    | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | 99          | --           | NM           | --           | NM          | --           | 17      | --      | NM     | --      | NM     | --      | NM     | --      |        |         |
| CADMIUM                            | 7440-43-9  | 5.0 (A,B)                                        | 5.0 (A,B)                                           | 1.3 (B,G,X)                                                  | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | <0.2 U      | --           | NM           | --           | NM          | --           | <0.2 U  | --      | NM     | --      | NM     | --      | NM     | --      |        |         |
| CALCIUM                            | 7440-70-2  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | 66,000      | --           | NM           | --           | NM          | --           | 17,000  | --      | NM     | --      | NM     | --      | NM     | --      |        |         |
| CHROMIUM                           | 7440-47-3  | 100 (A,B,H)                                      | 100 (A,B,H)                                         | 40 (B,G,H,X)                                                 | NA                                                                                             | NLV                                                                                               | NLV                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | 2.4         | --           | NM           | --           | NM          | --           | <1.0 U  | --      | NM     | --      | NM     | --      | NM     | --      |        |         |
| COPPER                             | 7440-50-8  | 4.0 (B,E)                                        | 4.0 (B,E)                                           | 14 (B,G)                                                     | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | 5.6         | [3]          | NM           | --           | NM          | --           | 110     | [3]     | NM     | --      | NM     | --      | NM     | --      |        |         |
| LEAD                               | 7439-92-1  | 4.0 (B,L)                                        | 4.0 (B,L)                                           | 14 (B,G,X)                                                   | NVL                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | <1.0 U      | --           | NM           | --           | NM          | --           | 1.8     | --      | NM     | --      | NM     | --      | <3 U   | --      |        |         |
| MAGNESIUM                          | 7439-95-4  | 400,000 (B)                                      | 1,100,000 (B)                                       | NA                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | 18,000      | --           | NM           | --           | NM          | --           | 1,900   | --      | NM     | --      | NM     | --      | NM     | --      |        |         |
| MANGANESE                          | 7439-96-5  | 50 (B,E)                                         | 50 (B,E)                                            | 1,000 (B,G,X)                                                | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | NM          | --           | NM           | --           | NM          | --           | NM      | --      | NM     | --      | NM     | --      | NM     | --      |        |         |
| MERCURY                            | 7439-97-6  | 2.0 (A,B,Z)                                      | 2.0 (A,B,Z)                                         | 0.0013 (B,Z)                                                 | 56 (B,S,Z)                                                                                     | 56 (B,S,Z)                                                                                        | 56 (B,Z)                | 0.088                                                                       | 0.14                                                    | 1.4                                        | 4.3                                           | 4.3                                           | 8.5                                                         | NM          | --           | NM          | --          | <0.2 U      | --           | NM           | --           | NM          | --           | <0.2 U  | --      | NM     | --      | NM     | --      | NM     | --      |        |         |
| POTASSIUM                          | 7440-09-7  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | 1,700       | --           | NM           | --           | NM          | --           | 2,700   | --      | NM     | --      | NM     | --      | NM     | --      |        |         |
| SELENIUM                           | 7782-49-2  | 50 (A,B)                                         | 50 (A,B)                                            | 5 (B)                                                        | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | <1.0 U      | --           | NM           | --           | NM          | --           | <1.0 U  | --      | NM     | --      | NM     | --      | NM     | --      |        |         |
| SILVER                             | 7440-22-4  | 34 (B)                                           | 98 (B)                                              | 0.2 (B,M)                                                    | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | <0.2 U      | --           | NM           | --           | NM          | --           | <0.2 U  | --      | NM     | --      | NM     | --      | NM     | --      |        |         |
| SODIUM                             | 7440-23-5  | 230,000 (HH)                                     | 350,000                                             | NA                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | 18,000      | --           | NM           | --           | NM          | --           | 350,000 | [1]     | NM     | --      | NM     | --      | NM     | --      |        |         |
| STRONTIUM                          | 7440-24-6  | 4,600 (B)                                        | 13,000 (B)                                          | 21,000 (B)                                                   | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | NM          | --           | NM           | --           | NM          | --           | NM      | --      | NM     | --      | NM     | --      | NM     | --      |        |         |
| ZINC                               | 7440-66-6  | 2,400 (B)                                        | 5,000 (B,E)                                         | 63 (B,G)                                                     | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | <5.0 U      | --           | NM           | --           | NM          | --           | <5.0 U  | --      | NM     | --      | NM     | --      | NM     | --      |        |         |
| Organics - PCBs as Aroclors (ug/l) |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |              |             |             |             |              |              |              |             |              |         |         |        |         |        |         |        |         |        |         |
| TOTAL PCBs                         | 1336-36-6  | 0.5 (A,J,T)                                      | 0.5 (A,J,T)                                         | 0.2 (J,M,T)                                                  | 45 (J,S,T)                                                                                     | 45 (J,S,T)                                                                                        | 44.7 (J,T)              | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | NM          | --           | NM           | --           | NM          | --           | NM      | --      | NM     | --      | NM     | --      | NM     | --      |        |         |
| Organics - SVOCs (ug/l)            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |              |             |             |             |              |              |              |             |              |         |         |        |         |        |         |        |         |        |         |
| 2-METHYLNAPHTHALENE (SVOC)         | 91-57-6S   | 260                                              | 750                                                 | 19                                                           | 25,000 (S)                                                                                     | 25,000 (S)                                                                                        | 24,600                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | <5.0 U      | --           | <5 U         | --           | NM          | --           | <5 UJ   | --      | <5.1 U | --      | NM     | --      | NM     | --      |        |         |
| ACENAPHTHENE                       | 83-32-9    | 1,300                                            | 3,800                                               | 38                                                           | 4,200 (S)                                                                                      | 4,200 (S)                                                                                         | 4,240                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | <1.0 U      | --           | <1 U         | --           | NM          | --           | <1 UJ   | --      | <1 U   | --      | NM     | --      | <5 U   | --      |        |         |
| ACENAPHTHYLENE                     | 208-96-8   | 52                                               | 150                                                 | ID                                                           | 3,900 (S)                                                                                      | 3,900 (S)                                                                                         | 3,930                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | <1.0 U      | --           | <1 U         | --           | NM          | --           | <1 UJ   | --      | <1 U   | --      | NM     | --      | <5 U   | --      |        |         |
| ANTHRACENE                         | 120-12-7   | 43 (S)                                           | 43 (S)                                              | ID                                                           | 43 (S)                                                                                         | 43 (S)                                                                                            | 43.4                    | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | <1.0 U      | --           | <1 U         | --           | NM          | --           | <1 UJ   | --      | <1 U   | --      | NM     | --      | <5 U   | --      |        |         |
| BENZO(A)ANTHRACENE                 | 56-55-3    | 2.1 (Q)                                          | 8.5 (Q)                                             | ID                                                           | NLV                                                                                            | NLV                                                                                               | 9.4 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | <1.0 U      | --           | <1 U         | --           | NM          | --           | <1 UJ   | --      | <1 U   | --      | NM     | --      | <5 U   | --      |        |         |
| BENZO(A)PYRENE                     | 50-32-8    | 5.0 (A,Q)                                        | 5.0 (A,Q)                                           | ID                                                           | NLV                                                                                            | NLV                                                                                               | 1.62 (Q)                | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | <1.0 U      | --           | <1 U         | --           | NM          | --           | <1 UJ   | --      | <1 U   | --      | NM     | --      | <5 U   | --      |        |         |
| BENZO(B)FLUORANTHENE               | 205-99-2   | 1.5 (Q,S,AA)                                     | 1.5 (Q,S,AA)                                        | ID                                                           | ID                                                                                             | ID                                                                                                | 1.5 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | <1.0 U      | --           | <1 U         | --           | NM          | --           | <1 UJ   | --      | <1 U   | --      | NM     | --      | <5 U   | --      |        |         |
| BENZO(G,H,I)PERYLENE               | 191-24-2   | 1.0 (M)                                          | 1.0 (M)                                             | ID                                                           | NLV                                                                                            | NLV                                                                                               | 0.26                    | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | <1.0 U      | --           | <1 U         | --           | NM          | --           | <1 UJ   | --      | <1 U   | --      | NM     | --      | <5 U   | --      |        |         |
| BENZO(K)FLUORANTHENE               | 207-08-9   | 1.0 (M,Q)                                        | 1.0 (M,Q)                                           | NA                                                           | NLV                                                                                            | NLV                                                                                               | 0.8 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | <1.0 U      | --           | <1 U         | --           | NM          | --           | <1 UJ   | --      | <1 U   | --      | NM     | --      | <5 U   | --      |        |         |
| CHRYSENE                           | 218-01-9   | 1.6 (Q,S)                                        | 1.6 (Q,S)                                           | ID                                                           | ID                                                                                             | ID                                                                                                | 1.6 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | <1.0 U      | --           | <1 U         | --           | NM          | --           | <1 UJ   | --      | <1 U   | --      | NM     | --      | <5 U   | --      |        |         |
| FLUORANTHENE                       | 206-44-0   | 210 (S)                                          | 210 (S)                                             | 1.6                                                          | 210 (S)                                                                                        | 210 (S)                                                                                           | 206                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | <1.0 U      | --           | <1 U         | --           | NM          | --           | <1 UJ   | --      | <1 U   | --      | NM     | --      | <5 U   | --      |        |         |
| FLUORENE                           | 86-73-7    | 880                                              | 2,000 (S)                                           | 12                                                           | 2,000 (S)                                                                                      | 2,000 (S)                                                                                         | 1,980                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | <1.0 U      | --           | <1 U         | --           | NM          | --           | <1 UJ   | --      | <1 U   | --      | NM     | --      | <5 U   | --      |        |         |
| INDENO(1,2,3-CD)PYRENE             | 193-39-5   | 2.0 (M,Q)                                        | 2.0 (M,Q)                                           | ID                                                           | NLV                                                                                            | NLV                                                                                               | 0.022 (Q)               | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | <2.0 U      | --           | <2 U         | --           | NM          | --           | <2 UJ   | --      | <2.1 U | --      | NM     | --      | <5 U   | --      |        |         |
| NAPHTHALENE (SVOC)                 | 91-20-3S   | 520                                              | 1,500                                               | 11                                                           | 31,000 (S)                                                                                     | 31,000 (S)                                                                                        | 31,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | <1.0 U      | --           | <1 U         | --           | NM          | --           | <1 UJ   | --      | <1 U   | --      | NM     | --      | <5 U   | --      |        |         |
| PENTACHLOROPHENOL                  | 87-86-5    | 1.0 (A)                                          | 1.0 (A)                                             | 1.8 (G,X)                                                    | NLV                                                                                            | NLV                                                                                               | 1.85E+06                | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | NM          | --           | NM           | --           | NM          | --           | NM      | --      | NM     | --      | NM     | --      | NM     | --      |        |         |
| PHENANTHRENE                       | 85-01-8    | 52                                               | 150                                                 | 2.0 (M)                                                      | 1,000 (S)                                                                                      | 1,000 (S)                                                                                         | 1,000                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | <1.0 U      | --           | <1 U         | --           | NM          | --           | <1 UJ   | --      | <1 U   | --      | NM     | --      | <5 U   | --      |        |         |
| PYRENE                             | 129-00-0   | 140 (S)                                          | 140 (S)                                             | ID                                                           | 140 (S)                                                                                        | 140 (S)                                                                                           | 135                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | <1.0 U      | --           | <1 U         | --           | NM          | --           | <1 UJ   | --      | <1 U   | --      | NM     | --      | <5 U   | --      |        |         |

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 6-2  
Summary of Groundwater Analytical Results  
Area B  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code              |            | EGLE Part 201 Generic Cleanup Criteria           |                                                     |                                                              |                                                                                                |                                                                                                   |                         | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                                         |                                            |                                               |                                               |                                                             | Area B      |              |             |             |             |              |              |              |             |              |        |         |        |         |        |         |        |         |        |         |
|----------------------------|------------|--------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------|-----------------------------------------------|-----------------------------------------------|-------------------------------------------------------------|-------------|--------------|-------------|-------------|-------------|--------------|--------------|--------------|-------------|--------------|--------|---------|--------|---------|--------|---------|--------|---------|--------|---------|
| Station Name               | CAS Number | [1]<br>Residential<br>Drinking Water<br>Criteria | [2]<br>Nonresidential<br>Drinking Water<br>Criteria | [3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [4]<br>Residential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [5]<br>Nonresidential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [6]<br>Water Solubility | [8]<br>Shallow<br>Groundwater<br>Residential<br>MSSL                        | [9]<br>Shallow<br>Groundwater<br>Nonresidential<br>MSSL | [10]<br>Groundwater<br>Residential<br>MSSL | [11]<br>Groundwater<br>Residential TS<br>MSSL | [12]<br>Groundwater<br>Nonresidential<br>MSSL | [13]<br>Groundwater<br>Nonresidential<br>MSSL <sub>12</sub> | MW-301      |              |             |             |             |              |              |              | MW-302      |              |        |         |        |         |        |         | MW-303 |         |        |         |
| Field Sample ID            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 5421 MW-301 | MW-301 10141 | QMCP MW-301 | QMCP-MW-301 | 5422 MW-302 | MW-302 10142 | QMCP MW-302  | QMCP-MW-302  | 5423 MW-303 | 8787 MW-303D |        |         |        |         |        |         |        |         |        |         |
| Sample Date                |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 7/25/1995   | 7/9/1998     | 9/6/2018    | 9/23/2020   | 7/25/1995   | 7/9/1998     | 9/6/2018     | 9/23/2020    | 7/25/1995   | 10/11/1996   |        |         |        |         |        |         |        |         |        |         |
| Sample Interval (bgs)      |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | --          | --           | 30 - 35 ft  | 30 - 35 ft  | --          | --           | 1.7 - 6.7 ft | 1.7 - 6.7 ft | --          | --           |        |         |        |         |        |         |        |         |        |         |
|                            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | Result      | Exceeds      | Result      | Exceeds     | Result      | Exceeds      | Result       | Exceeds      | Result      | Exceeds      | Result | Exceeds | Result | Exceeds | Result | Exceeds | Result | Exceeds | Result | Exceeds |
| Organics - VOCs (ug/l)     |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |              |             |             |             |              |              |              |             |              |        |         |        |         |        |         |        |         |        |         |
| 1,1,1-TRICHLOROETHANE      | 71-55-6    | 200 (A)                                          | 200 (A)                                             | 89                                                           | 660,000                                                                                        | 1,300,000 (S)                                                                                     | 1,330,000               | 180                                                                         | 500                                                     | 8,600                                      | 8,600                                         | 24,000                                        | 24,000                                                      | NM          | --           | NM          | --          | <1.0 U      | --           | <1 U         | --           | NM          | --           | NM     | --      | <1.0 U | --      | <1 U   | --      | NM     | --      | NM     | --      |
| 1,2,3-TRIMETHYLBENZENE     | 526-73-8   | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | 43 (JT)                                                                     | 67 (JT)                                                 | 800 (JT)                                   | 2,400 (JT)                                    | 2,300 (JT)                                    | 4,700 (JT)                                                  | NM          | --           | NM          | --          | <1.0 U      | --           | <1 U         | --           | NM          | --           | NM     | --      | <1.0 U | --      | <1 U   | --      | NM     | --      | NM     | --      |
| 1,2,4-TRIMETHYLBENZENE     | 95-63-6    | 63 (E,I)                                         | 63 (E,I)                                            | 17 (I)                                                       | 56,000 (I,S)                                                                                   | 56,000 (I,S)                                                                                      | 55,890 (I)              | 25 (JT)                                                                     | 44 (JT)                                                 | 440 (JT)                                   | 1,300 (JT)                                    | 1,300 (JT)                                    | 2,600 (JT)                                                  | NM          | --           | NM          | --          | <1.0 U      | --           | <1 U         | --           | NM          | --           | NM     | --      | <1.0 U | --      | <1 U   | --      | NM     | --      | NM     | --      |
| 1,3,5-TRIMETHYLBENZENE     | 108-67-8   | 72 (E,I)                                         | 72 (E,I)                                            | 45 (I)                                                       | 61,000 (I,S)                                                                                   | 61,000 (I,S)                                                                                      | 61,150 (I)              | 18 (JT)                                                                     | 30 (JT)                                                 | 310 (JT)                                   | 940 (JT)                                      | 920 (JT)                                      | 1,800 (JT)                                                  | NM          | --           | NM          | --          | <1.0 U      | --           | <1 U         | --           | NM          | --           | NM     | --      | <1.0 U | --      | <1 U   | --      | NM     | --      | NM     | --      |
| 2-METHYLNAPHTHALENE (VOC)  | 91-57-6V   | 260                                              | 750                                                 | 19                                                           | 25,000 (S)                                                                                     | 25,000 (S)                                                                                        | 24,600                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | <5.0 U      | --           | <5 U         | --           | NM          | --           | NM     | --      | <5.0 U | --      | <5 U   | --      | NM     | --      | NM     | --      |
| ACETONE                    | 67-64-1    | 730 (I)                                          | 2100 (I)                                            | 1700 (I)                                                     | 1.0E+9 (D,I,S)                                                                                 | 1.0E+9 (D,I,S)                                                                                    | 1.0E+9 (I)              | 50,000                                                                      | 62,000                                                  | 1.20E+07                                   | 1.20E+07                                      | 2.50E+07                                      | 2.50E+07                                                    | NM          | --           | NM          | --          | <20 U       | --           | <20 U        | --           | NM          | --           | NM     | --      | <20 U  | --      | <20 U  | --      | NM     | --      | NM     | --      |
| BENZENE                    | 71-43-2    | 5.0 (A,I)                                        | 5.0 (A,I)                                           | 12 (I,X)                                                     | 5,600 (I)                                                                                      | 35,000 (I)                                                                                        | 1,750,000 (I)           | 1                                                                           | 2.7                                                     | 14                                         | 82                                            | 66                                            | 130                                                         | NM          | --           | NM          | --          | <1.0 U      | --           | <1 U         | --           | NM          | --           | NM     | --      | <1.0 U | --      | <1 U   | --      | NM     | --      | <5 U   | --      |
| CYCLOHEXANE                | 110-82-7   | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | <5.0 U      | --           | <5 U         | --           | NM          | --           | NM     | --      | <5.0 U | --      | <5 U   | --      | NM     | --      | NM     | --      |
| ETHYLBENZENE               | 100-41-4   | 74 (E,I)                                         | 74 (E,I)                                            | 18 (I)                                                       | 110,000 (I)                                                                                    | 170,000 (I,S)                                                                                     | 169,000 (I)             | 2.8                                                                         | 7.6                                                     | 45                                         | 450                                           | 210                                           | 420                                                         | NM          | --           | NM          | --          | <1.0 U      | --           | <1 U         | --           | NM          | --           | NM     | --      | <1.0 U | --      | <1 U   | --      | NM     | --      | <1 U   | --      |
| HEXANE                     | 110-54-3   | 3,000                                            | 8,600                                               | NA                                                           | 12,000 (S)                                                                                     | 12,000 (S)                                                                                        | 12,000                  | 29                                                                          | 85                                                      | 29 (GW)                                    | 33                                            | 85 (GW)                                       | 170 (GW)                                                    | NM          | --           | NM          | --          | <1.0 U      | --           | <1 U         | --           | NM          | --           | NM     | --      | <1.0 U | --      | <1 U   | --      | NM     | --      | NM     | --      |
| ISOPROPYLBENZENE           | 98-82-8    | 800                                              | 2,300                                               | 28                                                           | 56,000 (S)                                                                                     | 56,000 (S)                                                                                        | 56,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | <1.0 U      | --           | <1 U         | --           | NM          | --           | NM     | --      | <1.0 U | --      | <1 U   | --      | NM     | --      | NM     | --      |
| M,P-XYLENE                 | 1330-20-7  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | <2.0 U      | --           | <2 U         | --           | NM          | --           | NM     | --      | <2.0 U | --      | <2 U   | --      | NM     | --      | NM     | --      |
| NAPHTHALENE (VOC)          | 91-20-3V   | 520                                              | 1,500                                               | 11                                                           | 31,000 (S)                                                                                     | 31,000 (S)                                                                                        | 31,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | <5.0 U      | --           | <5 U         | --           | NM          | --           | NM     | --      | <5.0 U | --      | <5 U   | --      | NM     | --      | NM     | --      |
| N-PROPYLBENZENE            | 103-65-1   | 80 (I)                                           | 230 (I)                                             | ID                                                           | ID                                                                                             | ID                                                                                                | NA                      | 43                                                                          | 83                                                      | 4100                                       | 12000                                         | 8100                                          | 8100                                                        | NM          | --           | NM          | --          | <1.0 U      | --           | <1 U         | --           | NM          | --           | NM     | --      | <1.0 U | --      | <1 U   | --      | NM     | --      | NM     | --      |
| O-XYLENE                   | 95-47-6    | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | <1.0 U      | --           | <1 U         | --           | NM          | --           | NM     | --      | <1.0 U | --      | <1 U   | --      | NM     | --      | NM     | --      |
| TETRACHLOROETHYLENE        | 127-18-4   | 5.0 (A)                                          | 5.0 (A)                                             | 11 (X)                                                       | 25,000                                                                                         | 170,000                                                                                           | 200,000                 | 1.5                                                                         | 3                                                       | 96                                         | 96                                            | 190                                           | 380                                                         | NM          | --           | NM          | --          | <1.0 U      | --           | <1 U         | --           | NM          | --           | NM     | --      | <1.0 U | --      | <1 U   | --      | NM     | --      | NM     | --      |
| TOLUENE                    | 108-88-3   | 790 (E,I)                                        | 790 (E,I)                                           | 270 (I)                                                      | 530,000 (I,S)                                                                                  | 530,000 (I,S)                                                                                     | 526,000 (I)             | 300                                                                         | 570                                                     | 23,000                                     | 33,000                                        | 66,000                                        | 66,000                                                      | NM          | --           | NM          | --          | <1.0 U      | --           | <1 U         | --           | NM          | --           | NM     | --      | <1.0 U | --      | <1 U   | --      | NM     | --      | <1 U   | --      |
| TRICHLOROETHYLENE          | 79-01-6    | 5.0 (A)                                          | 5.0 (A)                                             | 29 (X)                                                       | 2,200                                                                                          | 4,900                                                                                             | 1,100,000               | 0.073 (M)                                                                   | 0.14 (M)                                                | 6.1                                        | 18                                            | 12                                            | 24                                                          | NM          | --           | NM          | --          | <1.0 U      | --           | <1 U         | --           | NM          | --           | NM     | --      | <1.0 U | --      | <1 U   | --      | NM     | --      | NM     | --      |
| XYLENE - TOTAL             | 1330-20-7  | 280 (E,I)                                        | 280 (E,I)                                           | 49 (I)                                                       | 190,000 (I,S)                                                                                  | 190,000 (I,S)                                                                                     | 186,000 (I)             | 75 (J)                                                                      | 120 (J)                                                 | 1,200 (J)                                  | 3,600 (J)                                     | 3,500 (J)                                     | 7,100 (J)                                                   | NM          | --           | NM          | --          | ND          | --           | <0 U         | --           | NM          | --           | NM     | --      | ND     | --      | <0 U   | --      | NM     | --      | <3 U   | --      |
| Other                      |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |              |             |             |             |              |              |              |             |              |        |         |        |         |        |         |        |         |        |         |
| CHLORIDE (mg/l)            | 16887-00-6 | 250,000 (E)                                      | 250,000 (E)                                         | 50 (FF)                                                      | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 48          | --           | 1,200       | [3]         | NM          | --           | NM           | --           | 530         | [3]          | 16     | --      | NM     | --      | NM     | --      | 630    | [3]     | 170    | [3]     |
| NITROGEN (mg/l)            | 7727-37-9  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | NM          | --           | NM           | --           | NM          | --           | NM     | --      | NM     | --      | NM     | --      | NM     | --      | NM     | --      |
| HYDROCARBONS, TOTAL (mg/l) | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | NM          | --           | NM           | --           | NM          | --           | NM     | --      | NM     | --      | NM     | --      | NM     | --      | NM     | --      |
| Water Quality Parameters   |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |              |             |             |             |              |              |              |             |              |        |         |        |         |        |         |        |         |        |         |
| TEMPERATURE (°C)           | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | 10.8        | --           | 11.7         | --           | NM          | --           | NM     | --      | 15.6   | --      | 14     | --      | NM     | --      | NM     | --      |
| CONDUCTIVITY (mS/cm)       | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | 0.394       | --           | 0.459        | --           | NM          | --           | NM     | --      | 1.380  | --      | 1.700  | --      | NM     | --      | NM     | --      |
| DISSOLVED OXYGEN (%)       | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | 64.6        | --           | 87.5         | --           | NM          | --           | NM     | --      | 0.8    | --      | 6.6    | --      | NM     | --      | NM     | --      |
| pH                         | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | 7.82        | --           | 7.81         | --           | NM          | --           | NM     | --      | 7.64   | --      | 5.01   | --      | NM     | --      | NM     | --      |
| TURBIDITY (nTu)            | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM          | --          | 2.65        | --           | 4.38         | --           | NM          | --           | NM     | --      | 7.6    | --      | 8.3    | --      | NM     | --      | NM     | --      |

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 6-2  
Summary of Groundwater Analytical Results  
Area B  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code                      |            | EGLE Part 201 Generic Cleanup Criteria           |                                                     |                                                              |                                                                                                |                                                                                                   |                         | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                                         |                                            |                                               |                                               |                                                             | Area B      |         |            |         |             |         |             |         |             |         |             |         |             |         |             |         |
|------------------------------------|------------|--------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------|-----------------------------------------------|-----------------------------------------------|-------------------------------------------------------------|-------------|---------|------------|---------|-------------|---------|-------------|---------|-------------|---------|-------------|---------|-------------|---------|-------------|---------|
| Station Name                       | CAS Number | [1]<br>Residential<br>Drinking Water<br>Criteria | [2]<br>Nonresidential<br>Drinking Water<br>Criteria | [3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [4]<br>Residential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [5]<br>Nonresidential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [6]<br>Water Solubility | [8]<br>Shallow<br>Groundwater<br>Residential<br>MSSL                        | [9]<br>Shallow<br>Groundwater<br>Nonresidential<br>MSSL | [10]<br>Groundwater<br>Residential<br>MSSL | [11]<br>Groundwater<br>Residential TS<br>MSSL | [12]<br>Groundwater<br>Nonresidential<br>MSSL | [13]<br>Groundwater<br>Nonresidential<br>MSSL <sub>12</sub> | MW-305      |         | MW-306     |         | MW-401      |         | MW-402      |         | MW-403      |         | MW-404      |         | MW-405      |         | MW-406      |         |
| Field Sample ID                    |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 8788 MW-305 |         | 8000       |         | 5424 MW-401 |         | 5600 MW-402 |         | 5600 MW-403 |         | 8789 MW-404 |         | 8790 MW-405 |         | 7726 MW-406 |         |
| Sample Date                        |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 10/11/1996  |         | 10/23/1997 |         | 7/25/1995   |         | 7/25/1995   |         | 7/25/1995   |         | 10/11/1996  |         | 10/11/1996  |         | 3/6/1997    |         |
| Sample Interval (bgs)              |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | --          |         | --         |         | --          |         | --          |         | --          |         | --          |         | --          |         | --          |         |
|                                    |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | Result      | Exceeds | Result     | Exceeds | Result      | Exceeds | Result      | Exceeds | Result      | Exceeds | Result      | Exceeds | Result      | Exceeds | Result      | Exceeds |
| Inorganics - Metals (ug/l)         |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |         |            |         |             |         |             |         |             |         |             |         |             |         |             |         |
| ARSENIC                            | 7440-38-2  | 10 (A)                                           | 10 (A)                                              | 10                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM         | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| BARIUM                             | 7440-39-3  | 2,000 (A,B)                                      | 2,000 (A,B)                                         | 200 (B,G)                                                    | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM         | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| CADMIUM                            | 7440-43-9  | 5.0 (A,B)                                        | 5.0 (A,B)                                           | 1.3 (B,G,X)                                                  | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM         | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| CALCIUM                            | 7440-70-2  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM         | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| CHROMIUM                           | 7440-47-3  | 100 (A,B,H)                                      | 100 (A,B,H)                                         | 40 (B,G,H,X)                                                 | NA                                                                                             | NLV                                                                                               | NLV                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM         | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| COPPER                             | 7440-50-8  | 4.0 (B,E)                                        | 4.0 (B,E)                                           | 14 (B,G)                                                     | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM         | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| LEAD                               | 7439-92-1  | 4.0 (B,L)                                        | 4.0 (B,L)                                           | 14 (B,G,X)                                                   | NVL                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <3 U        | --      | 9.0        | [1,2]   | NM          | --      | NM          | --      | NM          | --      | <3 U        | --      | <3 U        | --      | 6.0         | [1,2]   |
| MAGNESIUM                          | 7439-95-4  | 400,000 (B)                                      | 1,100,000 (B)                                       | NA                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM         | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| MANGANESE                          | 7439-96-5  | 50 (B,E)                                         | 50 (B,E)                                            | 1,000 (B,G,X)                                                | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM         | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| MERCURY                            | 7439-97-6  | 2.0 (A,B,Z)                                      | 2.0 (A,B,Z)                                         | 0.0013 (B,Z)                                                 | 56 (B,S,Z)                                                                                     | 56 (B,S,Z)                                                                                        | 56 (B,Z)                | 0.088                                                                       | 0.14                                                    | 1.4                                        | 4.3                                           | 4.3                                           | 8.5                                                         | NM          | --      | NM         | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| POTASSIUM                          | 7440-09-7  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM         | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| SELENIUM                           | 7782-49-2  | 50 (A,B)                                         | 50 (A,B)                                            | 5 (B)                                                        | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM         | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| SILVER                             | 7440-22-4  | 34 (B)                                           | 98 (B)                                              | 0.2 (B,M)                                                    | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM         | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| SODIUM                             | 7440-23-5  | 230,000 (HH)                                     | 350,000                                             | NA                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM         | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| STRONTIUM                          | 7440-24-6  | 4,600 (B)                                        | 13,000 (B)                                          | 21,000 (B)                                                   | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM         | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| ZINC                               | 7440-66-6  | 2,400 (B)                                        | 5,000 (B,E)                                         | 63 (B,G)                                                     | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM         | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| Organics - PCBs as Aroclors (ug/l) |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |         |            |         |             |         |             |         |             |         |             |         |             |         |             |         |
| TOTAL PCBs                         | 1336-36-6  | 0.5 (A,J,T)                                      | 0.5 (A,J,T)                                         | 0.2 (J,M,T)                                                  | 45 (J,S,T)                                                                                     | 45 (J,S,T)                                                                                        | 44.7 (J,T)              | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM         | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| Organics - SVOCs (ug/l)            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |         |            |         |             |         |             |         |             |         |             |         |             |         |             |         |
| 2-METHYLNAPHTHALENE (SVOC)         | 91-57-6S   | 260                                              | 750                                                 | 19                                                           | 25,000 (S)                                                                                     | 25,000 (S)                                                                                        | 24,600                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM         | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| ACENAPHTHENE                       | 83-32-9    | 1,300                                            | 3,800                                               | 38                                                           | 4,200 (S)                                                                                      | 4,200 (S)                                                                                         | 4,240                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | <5 U       | --      | NM          | --      | NM          | --      | NM          | --      | <5 U        | --      | <5 U        | --      | <5 U        | --      |
| ACENAPHTHYLENE                     | 208-96-8   | 52                                               | 150                                                 | ID                                                           | 3,900 (S)                                                                                      | 3,900 (S)                                                                                         | 3,930                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | <5 U       | --      | NM          | --      | NM          | --      | NM          | --      | <5 U        | --      | <5 U        | --      | <5 U        | --      |
| ANTHRACENE                         | 120-12-7   | 43 (S)                                           | 43 (S)                                              | ID                                                           | 43 (S)                                                                                         | 43 (S)                                                                                            | 43.4                    | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | <5 U       | --      | NM          | --      | NM          | --      | NM          | --      | <5 U        | --      | <5 U        | --      | <5 U        | --      |
| BENZO(A)ANTHRACENE                 | 56-55-3    | 2.1 (Q)                                          | 8.5 (Q)                                             | ID                                                           | NLV                                                                                            | NLV                                                                                               | 9.4 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | <5 U       | --      | NM          | --      | NM          | --      | NM          | --      | <5 U        | --      | <5 U        | --      | <5 U        | --      |
| BENZO(A)PYRENE                     | 50-32-8    | 5.0 (A,Q)                                        | 5.0 (A,Q)                                           | ID                                                           | NLV                                                                                            | NLV                                                                                               | 1.62 (Q)                | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | <5 U       | --      | NM          | --      | NM          | --      | NM          | --      | <5 U        | --      | <5 U        | --      | <5 U        | --      |
| BENZO(B)FLUORANTHENE               | 205-99-2   | 1.5 (Q,S,AA)                                     | 1.5 (Q,S,AA)                                        | ID                                                           | ID                                                                                             | ID                                                                                                | 1.5 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | <5 U       | --      | NM          | --      | NM          | --      | NM          | --      | <5 U        | --      | <5 U        | --      | <5 U        | --      |
| BENZO(G,H,I)PERYLENE               | 191-24-2   | 1.0 (M)                                          | 1.0 (M)                                             | ID                                                           | NLV                                                                                            | NLV                                                                                               | 0.26                    | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | <5 U       | --      | NM          | --      | NM          | --      | NM          | --      | <5 U        | --      | <5 U        | --      | <5 U        | --      |
| BENZO(K)FLUORANTHENE               | 207-08-9   | 1.0 (M,Q)                                        | 1.0 (M,Q)                                           | NA                                                           | NLV                                                                                            | NLV                                                                                               | 0.8 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | <5 U       | --      | NM          | --      | NM          | --      | NM          | --      | <5 U        | --      | <5 U        | --      | <5 U        | --      |
| CHRYSENE                           | 218-01-9   | 1.6 (Q,S)                                        | 1.6 (Q,S)                                           | ID                                                           | ID                                                                                             | ID                                                                                                | 1.6 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | <5 U       | --      | NM          | --      | NM          | --      | NM          | --      | <5 U        | --      | <5 U        | --      | <5 U        | --      |
| FLUORANTHENE                       | 206-44-0   | 210 (S)                                          | 210 (S)                                             | 1.6                                                          | 210 (S)                                                                                        | 210 (S)                                                                                           | 206                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | <5 U       | --      | NM          | --      | NM          | --      | NM          | --      | <5 U        | --      | <5 U        | --      | <5 U        | --      |
| FLUORENE                           | 86-73-7    | 880                                              | 2,000 (S)                                           | 12                                                           | 2,000 (S)                                                                                      | 2,000 (S)                                                                                         | 1,980                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | <5 U       | --      | NM          | --      | NM          | --      | NM          | --      | <5 U        | --      | <5 U        | --      | <5 U        | --      |
| INDENO(1,2,3-CD)PYRENE             | 193-39-5   | 2.0 (M,Q)                                        | 2.0 (M,Q)                                           | ID                                                           | NLV                                                                                            | NLV                                                                                               | 0.022 (Q)               | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | <5 U       | --      | NM          | --      | NM          | --      | NM          | --      | <5 U        | --      | <5 U        | --      | <5 U        | --      |
| NAPHTHALENE (SVOC)                 | 91-20-3S   | 520                                              | 1,500                                               | 11                                                           | 31,000 (S)                                                                                     | 31,000 (S)                                                                                        | 31,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | <5 U       | --      | NM          | --      | NM          | --      | NM          | --      | <5 U        | --      | <5 U        | --      | <5 U        | --      |
| PENTACHLOROPHENOL                  | 87-86-5    | 1.0 (A)                                          | 1.0 (A)                                             | 1.8 (G,X)                                                    | NLV                                                                                            | NLV                                                                                               | 1.85E+06                | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM         | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| PHENANTHRENE                       | 85-01-8    | 52                                               | 150                                                 | 2.0 (M)                                                      | 1,000 (S)                                                                                      | 1,000 (S)                                                                                         | 1,000                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | <5 U       | --      | NM          | --      | NM          | --      | NM          | --      | <5 U        | --      | <5 U        | --      | <5 U        | --      |
| PYRENE                             | 129-00-0   | 140 (S)                                          | 140 (S)                                             | ID                                                           | 140 (S)                                                                                        | 140 (S)                                                                                           | 135                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | <5 U       | --      | NM          | --      | NM          | --      | NM          | --      | <5 U        | --      | <5 U        | --      | <5 U        | --      |

Note: Analytical and Criteria Footnotes are included on the last page of the table.



TABLE 6-2  
Summary of Groundwater Analytical Results  
Area B  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code              |            | EGLE Part 201 Generic Cleanup Criteria           |                                                     |                                                              |                                                                                                |                                                                                                   |                         | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                                         |                                            |                                               |                                               |                                                             | Area B      |         |            |         |             |         |             |         |             |         |             |         |             |         |             |         |
|----------------------------|------------|--------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------|-----------------------------------------------|-----------------------------------------------|-------------------------------------------------------------|-------------|---------|------------|---------|-------------|---------|-------------|---------|-------------|---------|-------------|---------|-------------|---------|-------------|---------|
| Station Name               | CAS Number | [1]<br>Residential<br>Drinking Water<br>Criteria | [2]<br>Nonresidential<br>Drinking Water<br>Criteria | [3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [4]<br>Residential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [5]<br>Nonresidential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [6]<br>Water Solubility | [8]<br>Shallow<br>Groundwater<br>Residential<br>MSSL                        | [9]<br>Shallow<br>Groundwater<br>Nonresidential<br>MSSL | [10]<br>Groundwater<br>Residential<br>MSSL | [11]<br>Groundwater<br>Residential TS<br>MSSL | [12]<br>Groundwater<br>Nonresidential<br>MSSL | [13]<br>Groundwater<br>Nonresidential<br>MSSL <sub>12</sub> | MW-305      |         | MW-306     |         | MW-401      |         | MW-402      |         | MW-403      |         | MW-404      |         | MW-405      |         | MW-406      |         |
| Field Sample ID            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 8788 MW-305 |         | 8000       |         | 5424 MW-401 |         | 5600 MW-402 |         | 5600 MW-403 |         | 8789 MW-404 |         | 8790 MW-405 |         | 7726 MW-406 |         |
| Sample Date                |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 10/11/1996  |         | 10/23/1997 |         | 7/25/1995   |         | 7/25/1995   |         | 7/25/1995   |         | 10/11/1996  |         | 10/11/1996  |         | 3/6/1997    |         |
| Sample Interval (bgs)      |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | --          |         | --         |         | --          |         | --          |         | --          |         | --          |         | --          |         | --          |         |
|                            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | Result      | Exceeds | Result     | Exceeds | Result      | Exceeds | Result      | Exceeds | Result      | Exceeds | Result      | Exceeds | Result      | Exceeds | Result      | Exceeds |
| Organics - VOCs (ug/l)     |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |         |            |         |             |         |             |         |             |         |             |         |             |         |             |         |
| 1,1,1-TRICHLOROETHANE      | 71-55-6    | 200 (A)                                          | 200 (A)                                             | 89                                                           | 660,000                                                                                        | 1,300,000 (S)                                                                                     | 1,330,000               | 180                                                                         | 500                                                     | 8,600                                      | 8,600                                         | 24,000                                        | 24,000                                                      | NM          | --      | NM         | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| 1,2,3-TRIMETHYLBENZENE     | 526-73-8   | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | 43 (JT)                                                                     | 67 (JT)                                                 | 800 (JT)                                   | 2,400 (JT)                                    | 2,300 (JT)                                    | 4,700 (JT)                                                  | NM          | --      | NM         | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| 1,2,4-TRIMETHYLBENZENE     | 95-63-6    | 63 (E,I)                                         | 63 (E,I)                                            | 17 (I)                                                       | 56,000 (I,S)                                                                                   | 56,000 (I,S)                                                                                      | 55,890 (I)              | 25 (JT)                                                                     | 44 (JT)                                                 | 440 (JT)                                   | 1,300 (JT)                                    | 1,300 (JT)                                    | 2,600 (JT)                                                  | NM          | --      | NM         | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| 1,3,5-TRIMETHYLBENZENE     | 108-67-8   | 72 (E,I)                                         | 72 (E,I)                                            | 45 (I)                                                       | 61,000 (I,S)                                                                                   | 61,000 (I,S)                                                                                      | 61,150 (I)              | 18 (JT)                                                                     | 30 (JT)                                                 | 310 (JT)                                   | 940 (JT)                                      | 920 (JT)                                      | 1,800 (JT)                                                  | NM          | --      | NM         | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| 2-METHYLNAPHTHALENE (VOC)  | 91-57-6V   | 260                                              | 750                                                 | 19                                                           | 25,000 (S)                                                                                     | 25,000 (S)                                                                                        | 24,600                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM         | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| ACETONE                    | 67-64-1    | 730 (I)                                          | 2100 (I)                                            | 1700 (I)                                                     | 1.0E+9 (D,I,S)                                                                                 | 1.0E+9 (D,I,S)                                                                                    | 1.0E+9 (I)              | 50,000                                                                      | 62,000                                                  | 1.20E+07                                   | 1.20E+07                                      | 2.50E+07                                      | 2.50E+07                                                    | NM          | --      | NM         | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| BENZENE                    | 71-43-2    | 5.0 (A,I)                                        | 5.0 (A,I)                                           | 12 (I,X)                                                     | 5,600 (I)                                                                                      | 35,000 (I)                                                                                        | 1,750,000 (I)           | 1                                                                           | 2.7                                                     | 14                                         | 82                                            | 66                                            | 130                                                         | <5 U        | --      | <5 U       | --      | NM          | --      | NM          | --      | NM          | --      | <5 U        | --      | <5 U        | --      | <5 U        | --      |
| CYCLOHEXANE                | 110-82-7   | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM         | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| ETHYLBENZENE               | 100-41-4   | 74 (E,I)                                         | 74 (E,I)                                            | 18 (I)                                                       | 110,000 (I)                                                                                    | 170,000 (I,S)                                                                                     | 169,000 (I)             | 2.8                                                                         | 7.6                                                     | 45                                         | 450                                           | 210                                           | 420                                                         | <1 U        | --      | <1 U       | --      | NM          | --      | NM          | --      | NM          | --      | <1 U        | --      | <1 U        | --      | <1 U        | --      |
| HEXANE                     | 110-54-3   | 3,000                                            | 8,600                                               | NA                                                           | 12,000 (S)                                                                                     | 12,000 (S)                                                                                        | 12,000                  | 29                                                                          | 85                                                      | 29 (GW)                                    | 33                                            | 85 (GW)                                       | 170 (GW)                                                    | NM          | --      | NM         | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| ISOPROPYLBENZENE           | 98-82-8    | 800                                              | 2,300                                               | 28                                                           | 56,000 (S)                                                                                     | 56,000 (S)                                                                                        | 56,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM         | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| M,P-XYLENE                 | 1330-20-7  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM         | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| NAPHTHALENE (VOC)          | 91-20-3V   | 520                                              | 1,500                                               | 11                                                           | 31,000 (S)                                                                                     | 31,000 (S)                                                                                        | 31,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM         | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| N-PROPYLBENZENE            | 103-65-1   | 80 (I)                                           | 230 (I)                                             | ID                                                           | ID                                                                                             | ID                                                                                                | NA                      | 43                                                                          | 83                                                      | 4100                                       | 12000                                         | 8100                                          | 8100                                                        | NM          | --      | NM         | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| O-XYLENE                   | 95-47-6    | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM         | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| TETRACHLOROETHYLENE        | 127-18-4   | 5.0 (A)                                          | 5.0 (A)                                             | 11 (X)                                                       | 25,000                                                                                         | 170,000                                                                                           | 200,000                 | 1.5                                                                         | 3                                                       | 96                                         | 96                                            | 190                                           | 380                                                         | NM          | --      | NM         | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| TOLUENE                    | 108-88-3   | 790 (E,I)                                        | 790 (E,I)                                           | 270 (I)                                                      | 530,000 (I,S)                                                                                  | 530,000 (I,S)                                                                                     | 526,000 (I)             | 300                                                                         | 570                                                     | 23,000                                     | 33,000                                        | 66,000                                        | 66,000                                                      | <1 U        | --      | <1 U       | --      | NM          | --      | NM          | --      | NM          | --      | <1 U        | --      | <1 U        | --      | <1 U        | --      |
| TRICHLOROETHYLENE          | 79-01-6    | 5.0 (A)                                          | 5.0 (A)                                             | 29 (X)                                                       | 2,200                                                                                          | 4,900                                                                                             | 1,100,000               | 0.073 (M)                                                                   | 0.14 (M)                                                | 6.1                                        | 18                                            | 12                                            | 24                                                          | NM          | --      | NM         | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| XYLENE - TOTAL             | 1330-20-7  | 280 (E,I)                                        | 280 (E,I)                                           | 49 (I)                                                       | 190,000 (I,S)                                                                                  | 190,000 (I,S)                                                                                     | 186,000 (I)             | 75 (J)                                                                      | 120 (J)                                                 | 1,200 (J)                                  | 3,600 (J)                                     | 3,500 (J)                                     | 7,100 (J)                                                   | <3 U        | --      | <3 U       | --      | NM          | --      | NM          | --      | NM          | --      | <3 U        | --      | <3 U        | --      | 3           | --      |
| Other                      |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |         |            |         |             |         |             |         |             |         |             |         |             |         |             |         |
| CHLORIDE (mg/l)            | 16887-00-6 | 250,000 (E)                                      | 250,000 (E)                                         | 50 (FF)                                                      | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 1,100       | [3]     | 240        | [3]     | 350         | [3]     | 29          | --      | 220         | [3]     | 120         | [3]     | 1,400       | [3]     | 34          | --      |
| NITROGEN (mg/l)            | 7727-37-9  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM         | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| HYDROCARBONS, TOTAL (mg/l) | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM         | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| Water Quality Parameters   |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |         |            |         |             |         |             |         |             |         |             |         |             |         |             |         |
| TEMPERATURE (°C)           | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM         | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| CONDUCTIVITY (mS/cm)       | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM         | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| DISSOLVED OXYGEN (%)       | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM         | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| pH                         | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM         | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |
| TURBIDITY (nTu)            | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM         | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      | NM          | --      |

Note: Analytical and Criteria Footnotes are included on the last page of the table.



TABLE 6-2  
Summary of Groundwater Analytical Results  
Area B  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code                      |            | EGLE Part 201 Generic Cleanup Criteria           |                                                     |                                                              |                                                                                                |                                                                                                   |                         | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                                         |                                            |                                               |                                               |                                                             | Area B      |              |              |                  |              |             |              |     |        |    |      |       |
|------------------------------------|------------|--------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------|-----------------------------------------------|-----------------------------------------------|-------------------------------------------------------------|-------------|--------------|--------------|------------------|--------------|-------------|--------------|-----|--------|----|------|-------|
| Station Name                       | CAS Number | [1]<br>Residential<br>Drinking Water<br>Criteria | [2]<br>Nonresidential<br>Drinking Water<br>Criteria | [3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [4]<br>Residential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [5]<br>Nonresidential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [6]<br>Water Solubility | [8]<br>Shallow<br>Groundwater<br>Residential<br>MSSL                        | [9]<br>Shallow<br>Groundwater<br>Nonresidential<br>MSSL | [10]<br>Groundwater<br>Residential<br>MSSL | [11]<br>Groundwater<br>Residential TS<br>MSSL | [12]<br>Groundwater<br>Nonresidential<br>MSSL | [13]<br>Groundwater<br>Nonresidential<br>MSSL <sub>12</sub> | Area B      |              |              |                  |              |             |              |     |        |    |      |       |
| Field Sample ID                    |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | MW-501      |              |              |                  |              |             |              |     | MW-502 |    |      |       |
| Sample Date                        |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 8782 MW-501 | MW-501 10136 | QMCP MW-501  | QMCP MW-501-DUP1 | QMCP-MW-501  | 8783 MW-502 | MW-502 10137 |     |        |    |      |       |
| Sample Interval (bgs)              |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 10/11/1996  | 7/9/1998     | 9/7/2018     | 9/7/2018         | 9/23/2020    | 10/11/1996  | 7/9/1998     |     |        |    |      |       |
|                                    |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | --          | --           | 1.5 - 6.5 ft | 1.5 - 6.5 ft     | 1.5 - 6.5 ft | --          | --           |     |        |    |      |       |
|                                    |            | Result                                           | Exceeds                                             | Result                                                       | Exceeds                                                                                        | Result                                                                                            | Exceeds                 | Result                                                                      | Exceeds                                                 | Result                                     | Exceeds                                       | Result                                        | Exceeds                                                     | Result      | Exceeds      | Result       | Exceeds          |              |             |              |     |        |    |      |       |
| Inorganics - Metals (ug/l)         |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |              |              |                  |              |             |              |     |        |    |      |       |
| ARSENIC                            | 7440-38-2  | 10 (A)                                           | 10 (A)                                              | 10                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM           | --               | 1.3          | --          | 1.3          | --  | NM     | -- | NM   | --    |
| BARIUM                             | 7440-39-3  | 2,000 (A,B)                                      | 2,000 (A,B)                                         | 200 (B,G)                                                    | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM           | --               | 40           | --          | 43           | --  | NM     | -- | NM   | --    |
| CADMIUM                            | 7440-43-9  | 5.0 (A,B)                                        | 5.0 (A,B)                                           | 1.3 (B,G,X)                                                  | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM           | --               | <0.2 U       | --          | <0.2 U       | --  | NM     | -- | NM   | --    |
| CALCIUM                            | 7440-70-2  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM           | --               | 26,000       | --          | 28,000       | --  | NM     | -- | NM   | --    |
| CHROMIUM                           | 7440-47-3  | 100 (A,B,H)                                      | 100 (A,B,H)                                         | 40 (B,G,H,X)                                                 | NA                                                                                             | NLV                                                                                               | NLV                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM           | --               | <1.0 U       | --          | <1.0 U       | --  | NM     | -- | NM   | --    |
| COPPER                             | 7440-50-8  | 4.0 (B,E)                                        | 4.0 (B,E)                                           | 14 (B,G)                                                     | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM           | --               | 9.7          | [3]         | 13           | [3] | NM     | -- | NM   | --    |
| LEAD                               | 7439-92-1  | 4.0 (B,L)                                        | 4.0 (B,L)                                           | 14 (B,G,X)                                                   | NVL                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <3 U        | --           | <3 U         | --               | 1.3          | --          | 1.8          | --  | NM     | -- | 6.0  | [1,2] |
| MAGNESIUM                          | 7439-95-4  | 400,000 (B)                                      | 1,100,000 (B)                                       | NA                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM           | --               | 4,800        | --          | 5,300        | --  | NM     | -- | NM   | --    |
| MANGANESE                          | 7439-96-5  | 50 (B,E)                                         | 50 (B,E)                                            | 1,000 (B,G,X)                                                | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM           | --               | NM           | --          | NM           | --  | NM     | -- | NM   | --    |
| MERCURY                            | 7439-97-6  | 2.0 (A,B,Z)                                      | 2.0 (A,B,Z)                                         | 0.0013 (B,Z)                                                 | 56 (B,S,Z)                                                                                     | 56 (B,S,Z)                                                                                        | 56 (B,Z)                | 0.088                                                                       | 0.14                                                    | 1.4                                        | 4.3                                           | 4.3                                           | 8.5                                                         | NM          | --           | NM           | --               | <0.2 U       | --          | <0.2 U       | --  | NM     | -- | NM   | --    |
| POTASSIUM                          | 7440-09-7  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM           | --               | 1,300        | --          | 1,400        | --  | NM     | -- | NM   | --    |
| SELENIUM                           | 7782-49-2  | 50 (A,B)                                         | 50 (A,B)                                            | 5 (B)                                                        | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM           | --               | <1.0 U       | --          | <1.0 U       | --  | NM     | -- | NM   | --    |
| SILVER                             | 7440-22-4  | 34 (B)                                           | 98 (B)                                              | 0.2 (B,M)                                                    | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM           | --               | <0.2 U       | --          | <0.2 U       | --  | NM     | -- | NM   | --    |
| SODIUM                             | 7440-23-5  | 230,000 (HH)                                     | 350,000                                             | NA                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM           | --               | 7,000        | --          | 7,400        | --  | NM     | -- | NM   | --    |
| STRONTIUM                          | 7440-24-6  | 4,600 (B)                                        | 13,000 (B)                                          | 21,000 (B)                                                   | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM           | --               | NM           | --          | NM           | --  | NM     | -- | NM   | --    |
| ZINC                               | 7440-66-6  | 2,400 (B)                                        | 5,000 (B,E)                                         | 63 (B,G)                                                     | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM           | --               | <5.0 U       | --          | 7            | --  | NM     | -- | NM   | --    |
| Organics - PCBs as Aroclors (ug/l) |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |              |              |                  |              |             |              |     |        |    |      |       |
| TOTAL PCBs                         | 1336-36-6  | 0.5 (A,J,T)                                      | 0.5 (A,J,T)                                         | 0.2 (J,M,T)                                                  | 45 (J,S,T)                                                                                     | 45 (J,S,T)                                                                                        | 44.7 (J,T)              | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM           | --               | NM           | --          | NM           | --  | NM     | -- | NM   | --    |
| Organics - SVOCs (ug/l)            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |              |              |                  |              |             |              |     |        |    |      |       |
| 2-METHYLNAPHTHALENE (SVOC)         | 91-57-6S   | 260                                              | 750                                                 | 19                                                           | 25,000 (S)                                                                                     | 25,000 (S)                                                                                        | 24,600                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM           | --               | <5.1 U       | --          | <5.0 U       | --  | <5 U   | -- | NM   | --    |
| ACENAPHTHENE                       | 83-32-9    | 1,300                                            | 3,800                                               | 38                                                           | 4,200 (S)                                                                                      | 4,200 (S)                                                                                         | 4,240                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <10 U       | --           | NM           | --               | <1.0 U       | --          | <1.0 U       | --  | <1 U   | -- | <5 U | --    |
| ACENAPHTHYLENE                     | 208-96-8   | 52                                               | 150                                                 | ID                                                           | 3,900 (S)                                                                                      | 3,900 (S)                                                                                         | 3,930                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <10 U       | --           | NM           | --               | <1.0 U       | --          | <1.0 U       | --  | <1 U   | -- | <5 U | --    |
| ANTHRACENE                         | 120-12-7   | 43 (S)                                           | 43 (S)                                              | ID                                                           | 43 (S)                                                                                         | 43 (S)                                                                                            | 43.4                    | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <10 U       | --           | NM           | --               | <1.0 U       | --          | <1.0 U       | --  | <1 U   | -- | <5 U | --    |
| BENZO(A)ANTHRACENE                 | 56-55-3    | 2.1 (Q)                                          | 8.5 (Q)                                             | ID                                                           | NLV                                                                                            | NLV                                                                                               | 9.4 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <10 U       | --           | NM           | --               | <1.0 U       | --          | <1.0 U       | --  | <1 U   | -- | <5 U | --    |
| BENZO(A)PYRENE                     | 50-32-8    | 5.0 (A,Q)                                        | 5.0 (A,Q)                                           | ID                                                           | NLV                                                                                            | NLV                                                                                               | 1.62 (Q)                | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <10 U       | --           | NM           | --               | <1.0 U       | --          | <1.0 U       | --  | <1 U   | -- | <5 U | --    |
| BENZO(B)FLUORANTHENE               | 205-99-2   | 1.5 (Q,S,AA)                                     | 1.5 (Q,S,AA)                                        | ID                                                           | ID                                                                                             | ID                                                                                                | 1.5 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <10 U       | --           | NM           | --               | <1.0 U       | --          | <1.0 U       | --  | <1 U   | -- | <5 U | --    |
| BENZO(G,H,I)PERYLENE               | 191-24-2   | 1.0 (M)                                          | 1.0 (M)                                             | ID                                                           | NLV                                                                                            | NLV                                                                                               | 0.26                    | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <10 U       | --           | NM           | --               | <1.0 U       | --          | <1.0 U       | --  | <1 U   | -- | <5 U | --    |
| BENZO(K)FLUORANTHENE               | 207-08-9   | 1.0 (M,Q)                                        | 1.0 (M,Q)                                           | NA                                                           | NLV                                                                                            | NLV                                                                                               | 0.8 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <10 U       | --           | NM           | --               | <1.0 U       | --          | <1.0 U       | --  | <1 U   | -- | <5 U | --    |
| CHRYSENE                           | 218-01-9   | 1.6 (Q,S)                                        | 1.6 (Q,S)                                           | ID                                                           | ID                                                                                             | ID                                                                                                | 1.6 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <10 U       | --           | NM           | --               | <1.0 U       | --          | <1.0 U       | --  | <1 U   | -- | <5 U | --    |
| FLUORANTHENE                       | 206-44-0   | 210 (S)                                          | 210 (S)                                             | 1.6                                                          | 210 (S)                                                                                        | 210 (S)                                                                                           | 206                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <10 U       | --           | NM           | --               | <1.0 U       | --          | <1.0 U       | --  | <1 U   | -- | <5 U | --    |
| FLUORENE                           | 86-73-7    | 880                                              | 2,000 (S)                                           | 12                                                           | 2,000 (S)                                                                                      | 2,000 (S)                                                                                         | 1,980                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <10 U       | --           | NM           | --               | <1.0 U       | --          | <1.0 U       | --  | <1 U   | -- | <5 U | --    |
| INDENO(1,2,3-CD)PYRENE             | 193-39-5   | 2.0 (M,Q)                                        | 2.0 (M,Q)                                           | ID                                                           | NLV                                                                                            | NLV                                                                                               | 0.022 (Q)               | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <10 U       | --           | NM           | --               | <2.0 U       | --          | <2.0 U       | --  | <2 U   | -- | <5 U | --    |
| NAPHTHALENE (SVOC)                 | 91-20-3S   | 520                                              | 1,500                                               | 11                                                           | 31,000 (S)                                                                                     | 31,000 (S)                                                                                        | 31,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <10 U       | --           | NM           | --               | <1.0 U       | --          | <1.0 U       | --  | <1 U   | -- | <5 U | --    |
| PENTACHLOROPHENOL                  | 87-86-5    | 1.0 (A)                                          | 1.0 (A)                                             | 1.8 (G,X)                                                    | NLV                                                                                            | NLV                                                                                               | 1.85E+06                | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM           | --               | NM           | --          | NM           | --  | NM     | -- | NM   | --    |
| PHENANTHRENE                       | 85-01-8    | 52                                               | 150                                                 | 2.0 (M)                                                      | 1,000 (S)                                                                                      | 1,000 (S)                                                                                         | 1,000                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <10 U       | --           | NM           | --               | <1.0 U       | --          | <1.0 U       | --  | <1 U   | -- | <5 U | --    |
| PYRENE                             | 129-00-0   | 140 (S)                                          | 140 (S)                                             | ID                                                           | 140 (S)                                                                                        | 140 (S)                                                                                           | 135                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <10 U       | --           | NM           | --               | <1.0 U       | --          | <1.0 U       | --  | <1 U   | -- | <5 U | --    |

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 6-2  
Summary of Groundwater Analytical Results  
Area B  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code              |            | EGLE Part 201 Generic Cleanup Criteria           |                                                     |                                                              |                                                                                                |                                                                                                   |                         | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                                         |                                            |                                               |                                               |                                                             | Area B      |              |              |                  |              |             |              |         |        |         |        |         |      |    |
|----------------------------|------------|--------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------|-----------------------------------------------|-----------------------------------------------|-------------------------------------------------------------|-------------|--------------|--------------|------------------|--------------|-------------|--------------|---------|--------|---------|--------|---------|------|----|
| Station Name               | CAS Number | [1]<br>Residential<br>Drinking Water<br>Criteria | [2]<br>Nonresidential<br>Drinking Water<br>Criteria | [3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [4]<br>Residential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [5]<br>Nonresidential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [6]<br>Water Solubility | [8]<br>Shallow<br>Groundwater<br>Residential<br>MSSL                        | [9]<br>Shallow<br>Groundwater<br>Nonresidential<br>MSSL | [10]<br>Groundwater<br>Residential<br>MSSL | [11]<br>Groundwater<br>Residential TS<br>MSSL | [12]<br>Groundwater<br>Nonresidential<br>MSSL | [13]<br>Groundwater<br>Nonresidential<br>MSSL <sub>12</sub> | MW-501      |              |              |                  |              |             |              |         | MW-502 |         |        |         |      |    |
| Field Sample ID            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 8782 MW-501 | MW-501 10136 | QMCP MW-501  | QMCP MW-501-DUP1 | QMCP-MW-501  | 8783 MW-502 | MW-502 10137 |         |        |         |        |         |      |    |
| Sample Date                |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 10/11/1996  | 7/9/1998     | 9/7/2018     | 9/7/2018         | 9/23/2020    | 10/11/1996  | 7/9/1998     |         |        |         |        |         |      |    |
| Sample Interval (bgs)      |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | --          | --           | 1.5 - 6.5 ft | 1.5 - 6.5 ft     | 1.5 - 6.5 ft | --          | --           |         |        |         |        |         |      |    |
|                            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | Result      | Exceeds      | Result       | Exceeds          | Result       | Exceeds     | Result       | Exceeds | Result | Exceeds | Result | Exceeds |      |    |
| Organics - VOCs (ug/l)     |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |              |              |                  |              |             |              |         |        |         |        |         |      |    |
| 1,1,1-TRICHLOROETHANE      | 71-55-6    | 200 (A)                                          | 200 (A)                                             | 89                                                           | 660,000                                                                                        | 1,300,000 (S)                                                                                     | 1,330,000               | 180                                                                         | 500                                                     | 8,600                                      | 8,600                                         | 24,000                                        | 24,000                                                      | NM          | --           | NM           | --               | <1.0 U       | --          | <1.0 U       | --      | <1 U   | --      | NM     | --      | NM   | -- |
| 1,2,3-TRIMETHYLBENZENE     | 526-73-8   | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | 43 (JT)                                                                     | 67 (JT)                                                 | 800 (JT)                                   | 2,400 (JT)                                    | 2,300 (JT)                                    | 4,700 (JT)                                                  | NM          | --           | NM           | --               | <1.0 U       | --          | <1.0 U       | --      | <1 U   | --      | NM     | --      | NM   | -- |
| 1,2,4-TRIMETHYLBENZENE     | 95-63-6    | 63 (E,I)                                         | 63 (E,I)                                            | 17 (I)                                                       | 56,000 (I,S)                                                                                   | 56,000 (I,S)                                                                                      | 55,890 (I)              | 25 (JT)                                                                     | 44 (JT)                                                 | 440 (JT)                                   | 1,300 (JT)                                    | 1,300 (JT)                                    | 2,600 (JT)                                                  | NM          | --           | NM           | --               | <1.0 U       | --          | <1.0 U       | --      | <1 U   | --      | NM     | --      | NM   | -- |
| 1,3,5-TRIMETHYLBENZENE     | 108-67-8   | 72 (E,I)                                         | 72 (E,I)                                            | 45 (I)                                                       | 61,000 (I,S)                                                                                   | 61,000 (I,S)                                                                                      | 61,150 (I)              | 18 (JT)                                                                     | 30 (JT)                                                 | 310 (JT)                                   | 940 (JT)                                      | 920 (JT)                                      | 1,800 (JT)                                                  | NM          | --           | NM           | --               | <1.0 U       | --          | <1.0 U       | --      | <1 U   | --      | NM     | --      | NM   | -- |
| 2-METHYLNAPHTHALENE (VOC)  | 91-57-6V   | 260                                              | 750                                                 | 19                                                           | 25,000 (S)                                                                                     | 25,000 (S)                                                                                        | 24,600                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM           | --               | <5.0 U       | --          | <5.0 U       | --      | <5 U   | --      | NM     | --      | NM   | -- |
| ACETONE                    | 67-64-1    | 730 (I)                                          | 2100 (I)                                            | 1700 (I)                                                     | 1.0E+9 (D,I,S)                                                                                 | 1.0E+9 (D,I,S)                                                                                    | 1.0E+9 (I)              | 50,000                                                                      | 62,000                                                  | 1.20E+07                                   | 1.20E+07                                      | 2.50E+07                                      | 2.50E+07                                                    | NM          | --           | NM           | --               | <20 UJ       | --          | <20 U        | --      | <20 U  | --      | NM     | --      | NM   | -- |
| BENZENE                    | 71-43-2    | 5.0 (A,I)                                        | 5.0 (A,I)                                           | 12 (I,X)                                                     | 5,600 (I)                                                                                      | 35,000 (I)                                                                                        | 1,750,000 (I)           | 1                                                                           | 2.7                                                     | 14                                         | 82                                            | 66                                            | 130                                                         | <5 U        | --           | <5 U         | --               | <1.0 U       | --          | <1.0 U       | --      | <1 U   | --      | <5 U   | --      | <5 U | -- |
| CYCLOHEXANE                | 110-82-7   | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM           | --               | <5.0 U       | --          | <5.0 U       | --      | <5 U   | --      | NM     | --      | NM   | -- |
| ETHYLBENZENE               | 100-41-4   | 74 (E,I)                                         | 74 (E,I)                                            | 18 (I)                                                       | 110,000 (I)                                                                                    | 170,000 (I,S)                                                                                     | 169,000 (I)             | 2.8                                                                         | 7.6                                                     | 45                                         | 450                                           | 210                                           | 420                                                         | <1 U        | --           | <1 U         | --               | <1.0 U       | --          | <1.0 U       | --      | <1 U   | --      | <1 U   | --      | <1 U | -- |
| HEXANE                     | 110-54-3   | 3,000                                            | 8,600                                               | NA                                                           | 12,000 (S)                                                                                     | 12,000 (S)                                                                                        | 12,000                  | 29                                                                          | 85                                                      | 29 (GW)                                    | 33                                            | 85 (GW)                                       | 170 (GW)                                                    | NM          | --           | NM           | --               | <1.0 U       | --          | <1.0 U       | --      | <1 U   | --      | NM     | --      | NM   | -- |
| ISOPROPYLBENZENE           | 98-82-8    | 800                                              | 2,300                                               | 28                                                           | 56,000 (S)                                                                                     | 56,000 (S)                                                                                        | 56,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM           | --               | <1.0 U       | --          | <1.0 U       | --      | <1 U   | --      | NM     | --      | NM   | -- |
| M,P-XYLENE                 | 1330-20-7  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM           | --               | <2.0 U       | --          | <2.0 U       | --      | <2 U   | --      | NM     | --      | NM   | -- |
| NAPHTHALENE (VOC)          | 91-20-3V   | 520                                              | 1,500                                               | 11                                                           | 31,000 (S)                                                                                     | 31,000 (S)                                                                                        | 31,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM           | --               | <5.0 U       | --          | <5.0 U       | --      | <5 U   | --      | NM     | --      | NM   | -- |
| N-PROPYLBENZENE            | 103-65-1   | 80 (I)                                           | 230 (I)                                             | ID                                                           | ID                                                                                             | ID                                                                                                | NA                      | 43                                                                          | 83                                                      | 4100                                       | 12000                                         | 8100                                          | 8100                                                        | NM          | --           | NM           | --               | <1.0 U       | --          | <1.0 U       | --      | <1 U   | --      | NM     | --      | NM   | -- |
| O-XYLENE                   | 95-47-6    | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM           | --               | <1.0 U       | --          | <1.0 U       | --      | <1 U   | --      | NM     | --      | NM   | -- |
| TETRACHLOROETHYLENE        | 127-18-4   | 5.0 (A)                                          | 5.0 (A)                                             | 11 (X)                                                       | 25,000                                                                                         | 170,000                                                                                           | 200,000                 | 1.5                                                                         | 3                                                       | 96                                         | 96                                            | 190                                           | 380                                                         | NM          | --           | NM           | --               | <1.0 U       | --          | <1.0 U       | --      | <1 U   | --      | NM     | --      | NM   | -- |
| TOLUENE                    | 108-88-3   | 790 (E,I)                                        | 790 (E,I)                                           | 270 (I)                                                      | 530,000 (I,S)                                                                                  | 530,000 (I,S)                                                                                     | 526,000 (I)             | 300                                                                         | 570                                                     | 23,000                                     | 33,000                                        | 66,000                                        | 66,000                                                      | 3           | --           | 7.1          | --               | <1.0 U       | --          | <1.0 U       | --      | 1.1    | --      | 11     | --      | <1 U | -- |
| TRICHLOROETHYLENE          | 79-01-6    | 5.0 (A)                                          | 5.0 (A)                                             | 29 (X)                                                       | 2,200                                                                                          | 4,900                                                                                             | 1,100,000               | 0.073 (M)                                                                   | 0.14 (M)                                                | 6.1                                        | 18                                            | 12                                            | 24                                                          | NM          | --           | NM           | --               | <1.0 U       | --          | <1.0 U       | --      | <1 U   | --      | NM     | --      | NM   | -- |
| XYLENE - TOTAL             | 1330-20-7  | 280 (E,I)                                        | 280 (E,I)                                           | 49 (I)                                                       | 190,000 (I,S)                                                                                  | 190,000 (I,S)                                                                                     | 186,000 (I)             | 75 (J)                                                                      | 120 (J)                                                 | 1,200 (J)                                  | 3,600 (J)                                     | 3,500 (J)                                     | 7,100 (J)                                                   | <3 U        | --           | <3 U         | --               | ND           | --          | ND           | --      | <0 U   | --      | <3 U   | --      | <3 U | -- |
| Other                      |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |              |              |                  |              |             |              |         |        |         |        |         |      |    |
| CHLORIDE (mg/l)            | 16887-00-6 | 250,000 (E)                                      | 250,000 (E)                                         | 50 (FF)                                                      | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 40          | --           | NM           | --               | NM           | --          | NM           | --      | NM     | --      | <10 U  | --      | NM   | -- |
| NITROGEN (mg/l)            | 7727-37-9  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM           | --               | NM           | --          | NM           | --      | NM     | --      | NM     | --      | NM   | -- |
| HYDROCARBONS, TOTAL (mg/l) | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM           | --               | NM           | --          | NM           | --      | NM     | --      | NM     | --      | NM   | -- |
| Water Quality Parameters   |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |              |              |                  |              |             |              |         |        |         |        |         |      |    |
| TEMPERATURE (°C)           | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM           | --               | 18.5         | --          | NM           | --      | 15.8   | --      | NM     | --      | NM   | -- |
| CONDUCTIVITY (mS/cm)       | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM           | --               | 0.190        | --          | NM           | --      | 0.292  | --      | NM     | --      | NM   | -- |
| DISSOLVED OXYGEN (%)       | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM           | --               | 0.8          | --          | NM           | --      | 2.7    | --      | NM     | --      | NM   | -- |
| pH                         | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM           | --               | 6.55         | --          | NM           | --      | 6.73   | --      | NM     | --      | NM   | -- |
| TURBIDITY (nTu)            | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --           | NM           | --               | 5.3          | --          | NM           | --      | 2.3    | --      | NM     | --      | NM   | -- |

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 6-2  
Summary of Groundwater Analytical Results  
Area B  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code                      |            | EGLE Part 201 Generic Cleanup Criteria           |                                                     |                                                              |                                                                                                |                                                                                                   |                         | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                                         |                                            |                                               |                                               |                                                             |             | Area B  |              |         |              |         |              |         |             |         |              |         |
|------------------------------------|------------|--------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------|-----------------------------------------------|-----------------------------------------------|-------------------------------------------------------------|-------------|---------|--------------|---------|--------------|---------|--------------|---------|-------------|---------|--------------|---------|
| Station Name                       | CAS Number | [1]<br>Residential<br>Drinking Water<br>Criteria | [2]<br>Nonresidential<br>Drinking Water<br>Criteria | [3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [4]<br>Residential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [5]<br>Nonresidential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [6]<br>Water Solubility | [8]<br>Shallow<br>Groundwater<br>Residential<br>MSSL                        | [9]<br>Shallow<br>Groundwater<br>Nonresidential<br>MSSL | [10]<br>Groundwater<br>Residential<br>MSSL | [11]<br>Groundwater<br>Residential TS<br>MSSL | [12]<br>Groundwater<br>Nonresidential<br>MSSL | [13]<br>Groundwater<br>Nonresidential<br>MSSL <sub>12</sub> | MW-503      |         |              |         |              |         |              |         | MW-504      |         |              |         |
| Field Sample ID                    |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 8784 MW-503 |         | MW-503 10138 |         | QMCP MW-503  |         | QMCP-MW-503  |         | 8785 MW-504 |         | MW-504 10139 |         |
| Sample Date                        |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 10/11/1996  |         | 7/9/1998     |         | 9/7/2018     |         | 9/23/2020    |         | 10/11/1996  |         | 7/9/1998     |         |
| Sample Interval (bgs)              |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | --          |         | --           |         | 1.5 - 6.5 ft |         | 1.5 - 6.5 ft |         | --          |         | --           |         |
|                                    |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | Result      | Exceeds | Result       | Exceeds | Result       | Exceeds | Result       | Exceeds | Result      | Exceeds | Result       | Exceeds |
| Inorganics - Metals (ug/l)         |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |         |              |         |              |         |              |         |             |         |              |         |
| ARSENIC                            | 7440-38-2  | 10 (A)                                           | 10 (A)                                              | 10                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | 1.9          | --      | NM           | --      | NM          | --      | NM           | --      |
| BARIUM                             | 7440-39-3  | 2,000 (A,B)                                      | 2,000 (A,B)                                         | 200 (B,G)                                                    | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | 49           | --      | NM           | --      | NM          | --      | NM           | --      |
| CADMIUM                            | 7440-43-9  | 5.0 (A,B)                                        | 5.0 (A,B)                                           | 1.3 (B,G,X)                                                  | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | <0.2 U       | --      | NM           | --      | NM          | --      | NM           | --      |
| CALCIUM                            | 7440-70-2  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | 35,000       | --      | NM           | --      | NM          | --      | NM           | --      |
| CHROMIUM                           | 7440-47-3  | 100 (A,B,H)                                      | 100 (A,B,H)                                         | 40 (B,G,H,X)                                                 | NA                                                                                             | NLV                                                                                               | NLV                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | <1.0 U       | --      | NM           | --      | NM          | --      | NM           | --      |
| COPPER                             | 7440-50-8  | 4.0 (B,E)                                        | 4.0 (B,E)                                           | 14 (B,G)                                                     | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | 25           | [3]     | NM           | --      | NM          | --      | NM           | --      |
| LEAD                               | 7439-92-1  | 4.0 (B,L)                                        | 4.0 (B,L)                                           | 14 (B,G,X)                                                   | NVL                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <3 U        | --      | <3 U         | --      | <1.0 U       | --      | NM           | --      | <3 U        | --      | <3 U         | --      |
| MAGNESIUM                          | 7439-95-4  | 400,000 (B)                                      | 1,100,000 (B)                                       | NA                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | 5,500        | --      | NM           | --      | NM          | --      | NM           | --      |
| MANGANESE                          | 7439-96-5  | 50 (B,E)                                         | 50 (B,E)                                            | 1,000 (B,G,X)                                                | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | NM           | --      | NM           | --      | NM          | --      | NM           | --      |
| MERCURY                            | 7439-97-6  | 2.0 (A,B,Z)                                      | 2.0 (A,B,Z)                                         | 0.0013 (B,Z)                                                 | 56 (B,S,Z)                                                                                     | 56 (B,S,Z)                                                                                        | 56 (B,Z)                | 0.088                                                                       | 0.14                                                    | 1.4                                        | 4.3                                           | 4.3                                           | 8.5                                                         | NM          | --      | NM           | --      | <0.2 U       | --      | NM           | --      | NM          | --      | NM           | --      |
| POTASSIUM                          | 7440-09-7  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | 1,900        | --      | NM           | --      | NM          | --      | NM           | --      |
| SELENIUM                           | 7782-49-2  | 50 (A,B)                                         | 50 (A,B)                                            | 5 (B)                                                        | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | <1.0 U       | --      | NM           | --      | NM          | --      | NM           | --      |
| SILVER                             | 7440-22-4  | 34 (B)                                           | 98 (B)                                              | 0.2 (B,M)                                                    | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | <0.2 U       | --      | NM           | --      | NM          | --      | NM           | --      |
| SODIUM                             | 7440-23-5  | 230,000 (HH)                                     | 350,000                                             | NA                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | 16,000       | --      | NM           | --      | NM          | --      | NM           | --      |
| STRONTIUM                          | 7440-24-6  | 4,600 (B)                                        | 13,000 (B)                                          | 21,000 (B)                                                   | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | NM           | --      | NM           | --      | NM          | --      | NM           | --      |
| ZINC                               | 7440-66-6  | 2,400 (B)                                        | 5,000 (B,E)                                         | 63 (B,G)                                                     | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | 12           | --      | NM           | --      | NM          | --      | NM           | --      |
| Organics - PCBs as Aroclors (ug/l) |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |         |              |         |              |         |              |         |             |         |              |         |
| TOTAL PCBs                         | 1336-36-6  | 0.5 (A,J,T)                                      | 0.5 (A,J,T)                                         | 0.2 (J,M,T)                                                  | 45 (J,S,T)                                                                                     | 45 (J,S,T)                                                                                        | 44.7 (J,T)              | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | NM           | --      | NM           | --      | NM          | --      | NM           | --      |
| Organics - SVOCs (ug/l)            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |         |              |         |              |         |              |         |             |         |              |         |
| 2-METHYLNAPHTHALENE (SVOC)         | 91-57-6S   | 260                                              | 750                                                 | 19                                                           | 25,000 (S)                                                                                     | 25,000 (S)                                                                                        | 24,600                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | <5.0 U       | --      | <5 U         | --      | NM          | --      | NM           | --      |
| ACENAPHTHENE                       | 83-32-9    | 1,300                                            | 3,800                                               | 38                                                           | 4,200 (S)                                                                                      | 4,200 (S)                                                                                         | 4,240                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | <5 U        | --      | NM           | --      |
| ACENAPHTHYLENE                     | 208-96-8   | 52                                               | 150                                                 | ID                                                           | 3,900 (S)                                                                                      | 3,900 (S)                                                                                         | 3,930                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | <5 U        | --      | NM           | --      |
| ANTHRACENE                         | 120-12-7   | 43 (S)                                           | 43 (S)                                              | ID                                                           | 43 (S)                                                                                         | 43 (S)                                                                                            | 43.4                    | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | <5 U        | --      | NM           | --      |
| BENZO(A)ANTHRACENE                 | 56-55-3    | 2.1 (Q)                                          | 8.5 (Q)                                             | ID                                                           | NLV                                                                                            | NLV                                                                                               | 9.4 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | <5 U        | --      | NM           | --      |
| BENZO(A)PYRENE                     | 50-32-8    | 5.0 (A,Q)                                        | 5.0 (A,Q)                                           | ID                                                           | NLV                                                                                            | NLV                                                                                               | 1.62 (Q)                | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | <5 U        | --      | NM           | --      |
| BENZO(B)FLUORANTHENE               | 205-99-2   | 1.5 (Q,S,AA)                                     | 1.5 (Q,S,AA)                                        | ID                                                           | ID                                                                                             | ID                                                                                                | 1.5 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | <5 U        | --      | NM           | --      |
| BENZO(G,H,I)PERYLENE               | 191-24-2   | 1.0 (M)                                          | 1.0 (M)                                             | ID                                                           | NLV                                                                                            | NLV                                                                                               | 0.26                    | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | <5 U        | --      | NM           | --      |
| BENZO(K)FLUORANTHENE               | 207-08-9   | 1.0 (M,Q)                                        | 1.0 (M,Q)                                           | NA                                                           | NLV                                                                                            | NLV                                                                                               | 0.8 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | <5 U        | --      | NM           | --      |
| CHRYSENE                           | 218-01-9   | 1.6 (Q,S)                                        | 1.6 (Q,S)                                           | ID                                                           | ID                                                                                             | ID                                                                                                | 1.6 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | <5 U        | --      | NM           | --      |
| FLUORANTHENE                       | 206-44-0   | 210 (S)                                          | 210 (S)                                             | 1.6                                                          | 210 (S)                                                                                        | 210 (S)                                                                                           | 206                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | <5 U        | --      | NM           | --      |
| FLUORENE                           | 86-73-7    | 880                                              | 2,000 (S)                                           | 12                                                           | 2,000 (S)                                                                                      | 2,000 (S)                                                                                         | 1,980                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | <5 U        | --      | NM           | --      |
| INDENO(1,2,3-CD)PYRENE             | 193-39-5   | 2.0 (M,Q)                                        | 2.0 (M,Q)                                           | ID                                                           | NLV                                                                                            | NLV                                                                                               | 0.022 (Q)               | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | NM           | --      | <2.0 U       | --      | <2 U         | --      | <5 U        | --      | NM           | --      |
| NAPHTHALENE (SVOC)                 | 91-20-3S   | 520                                              | 1,500                                               | 11                                                           | 31,000 (S)                                                                                     | 31,000 (S)                                                                                        | 31,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | <5 U        | --      | NM           | --      |
| PENTACHLOROPHENOL                  | 87-86-5    | 1.0 (A)                                          | 1.0 (A)                                             | 1.8 (G,X)                                                    | NLV                                                                                            | NLV                                                                                               | 1.85E+06                | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | NM           | --      | NM           | --      | NM          | --      | NM           | --      |
| PHENANTHRENE                       | 85-01-8    | 52                                               | 150                                                 | 2.0 (M)                                                      | 1,000 (S)                                                                                      | 1,000 (S)                                                                                         | 1,000                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | <5 U        | --      | NM           | --      |
| PYRENE                             | 129-00-0   | 140 (S)                                          | 140 (S)                                             | ID                                                           | 140 (S)                                                                                        | 140 (S)                                                                                           | 135                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | <5 U        | --      | NM           | --      |

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 6-2  
Summary of Groundwater Analytical Results  
Area B  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code              |            | EGLE Part 201 Generic Cleanup Criteria           |                                                     |                                                              |                                                                                                |                                                                                                   |                         | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                                         |                                            |                                               |                                               |                                                             |             | Area B  |              |         |              |         |              |         |             |         |              |         |
|----------------------------|------------|--------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------|-----------------------------------------------|-----------------------------------------------|-------------------------------------------------------------|-------------|---------|--------------|---------|--------------|---------|--------------|---------|-------------|---------|--------------|---------|
| Station Name               | CAS Number | [1]<br>Residential<br>Drinking Water<br>Criteria | [2]<br>Nonresidential<br>Drinking Water<br>Criteria | [3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [4]<br>Residential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [5]<br>Nonresidential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [6]<br>Water Solubility | [8]<br>Shallow<br>Groundwater<br>Residential<br>MSSL                        | [9]<br>Shallow<br>Groundwater<br>Nonresidential<br>MSSL | [10]<br>Groundwater<br>Residential<br>MSSL | [11]<br>Groundwater<br>Residential TS<br>MSSL | [12]<br>Groundwater<br>Nonresidential<br>MSSL | [13]<br>Groundwater<br>Nonresidential<br>MSSL <sub>12</sub> | MW-503      |         |              |         |              |         |              |         | MW-504      |         |              |         |
| Field Sample ID            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 8784 MW-503 |         | MW-503 10138 |         | QMCP MW-503  |         | QMCP-MW-503  |         | 8785 MW-504 |         | MW-504 10139 |         |
| Sample Date                |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 10/11/1996  |         | 7/9/1998     |         | 9/7/2018     |         | 9/23/2020    |         | 10/11/1996  |         | 7/9/1998     |         |
| Sample Interval (bgs)      |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | --          |         | --           |         | 1.5 - 6.5 ft |         | 1.5 - 6.5 ft |         | --          |         | --           |         |
|                            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | Result      | Exceeds | Result       | Exceeds | Result       | Exceeds | Result       | Exceeds | Result      | Exceeds | Result       | Exceeds |
| Organics - VOCs (ug/l)     |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |         |              |         |              |         |              |         |             |         |              |         |
| 1,1,1-TRICHLOROETHANE      | 71-55-6    | 200 (A)                                          | 200 (A)                                             | 89                                                           | 660,000                                                                                        | 1,300,000 (S)                                                                                     | 1,330,000               | 180                                                                         | 500                                                     | 8,600                                      | 8,600                                         | 24,000                                        | 24,000                                                      | NM          | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | NM          | --      | NM           | --      |
| 1,2,3-TRIMETHYLBENZENE     | 526-73-8   | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | 43 (JT)                                                                     | 67 (JT)                                                 | 800 (JT)                                   | 2,400 (JT)                                    | 2,300 (JT)                                    | 4,700 (JT)                                                  | NM          | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | NM          | --      | NM           | --      |
| 1,2,4-TRIMETHYLBENZENE     | 95-63-6    | 63 (E,I)                                         | 63 (E,I)                                            | 17 (I)                                                       | 56,000 (I,S)                                                                                   | 56,000 (I,S)                                                                                      | 55,890 (I)              | 25 (JT)                                                                     | 44 (JT)                                                 | 440 (JT)                                   | 1,300 (JT)                                    | 1,300 (JT)                                    | 2,600 (JT)                                                  | NM          | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | NM          | --      | NM           | --      |
| 1,3,5-TRIMETHYLBENZENE     | 108-67-8   | 72 (E,I)                                         | 72 (E,I)                                            | 45 (I)                                                       | 61,000 (I,S)                                                                                   | 61,000 (I,S)                                                                                      | 61,150 (I)              | 18 (JT)                                                                     | 30 (JT)                                                 | 310 (JT)                                   | 940 (JT)                                      | 920 (JT)                                      | 1,800 (JT)                                                  | NM          | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | NM          | --      | NM           | --      |
| 2-METHYLNAPHTHALENE (VOC)  | 91-57-6V   | 260                                              | 750                                                 | 19                                                           | 25,000 (S)                                                                                     | 25,000 (S)                                                                                        | 24,600                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | <5.0 U       | --      | <5 U         | --      | NM          | --      | NM           | --      |
| ACETONE                    | 67-64-1    | 730 (I)                                          | 2100 (I)                                            | 1700 (I)                                                     | 1.0E+9 (D,I,S)                                                                                 | 1.0E+9 (D,I,S)                                                                                    | 1.0E+9 (I)              | 50,000                                                                      | 62,000                                                  | 1.20E+07                                   | 1.20E+07                                      | 2.50E+07                                      | 2.50E+07                                                    | NM          | --      | NM           | --      | <20 U        | --      | <20 U        | --      | NM          | --      | NM           | --      |
| BENZENE                    | 71-43-2    | 5.0 (A,I)                                        | 5.0 (A,I)                                           | 12 (I,X)                                                     | 5,600 (I)                                                                                      | 35,000 (I)                                                                                        | 1,750,000 (I)           | 1                                                                           | 2.7                                                     | 14                                         | 82                                            | 66                                            | 130                                                         | <5 U        | --      | <5 U         | --      | <1.0 U       | --      | <1 U         | --      | <5 U        | --      | <5 U         | --      |
| CYCLOHEXANE                | 110-82-7   | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | <5.0 U       | --      | <5 U         | --      | NM          | --      | NM           | --      |
| ETHYLBENZENE               | 100-41-4   | 74 (E,I)                                         | 74 (E,I)                                            | 18 (I)                                                       | 110,000 (I)                                                                                    | 170,000 (I,S)                                                                                     | 169,000 (I)             | 2.8                                                                         | 7.6                                                     | 45                                         | 450                                           | 210                                           | 420                                                         | <1 U        | --      | <1 U         | --      | <1.0 U       | --      | <1 U         | --      | <1 U        | --      | <1 U         | --      |
| HEXANE                     | 110-54-3   | 3,000                                            | 8,600                                               | NA                                                           | 12,000 (S)                                                                                     | 12,000 (S)                                                                                        | 12,000                  | 29                                                                          | 85                                                      | 29 (GW)                                    | 33                                            | 85 (GW)                                       | 170 (GW)                                                    | NM          | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | NM          | --      | NM           | --      |
| ISOPROPYLBENZENE           | 98-82-8    | 800                                              | 2,300                                               | 28                                                           | 56,000 (S)                                                                                     | 56,000 (S)                                                                                        | 56,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | NM          | --      | NM           | --      |
| M,P-XYLENE                 | 1330-20-7  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | <2.0 U       | --      | <2 U         | --      | NM          | --      | NM           | --      |
| NAPHTHALENE (VOC)          | 91-20-3V   | 520                                              | 1,500                                               | 11                                                           | 31,000 (S)                                                                                     | 31,000 (S)                                                                                        | 31,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | <5.0 U       | --      | <5 U         | --      | NM          | --      | NM           | --      |
| N-PROPYLBENZENE            | 103-65-1   | 80 (I)                                           | 230 (I)                                             | ID                                                           | ID                                                                                             | ID                                                                                                | NA                      | 43                                                                          | 83                                                      | 4100                                       | 12000                                         | 8100                                          | 8100                                                        | NM          | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | NM          | --      | NM           | --      |
| O-XYLENE                   | 95-47-6    | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | NM          | --      | NM           | --      |
| TETRACHLOROETHYLENE        | 127-18-4   | 5.0 (A)                                          | 5.0 (A)                                             | 11 (X)                                                       | 25,000                                                                                         | 170,000                                                                                           | 200,000                 | 1.5                                                                         | 3                                                       | 96                                         | 96                                            | 190                                           | 380                                                         | NM          | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | NM          | --      | NM           | --      |
| TOLUENE                    | 108-88-3   | 790 (E,I)                                        | 790 (E,I)                                           | 270 (I)                                                      | 530,000 (I,S)                                                                                  | 530,000 (I,S)                                                                                     | 526,000 (I)             | 300                                                                         | 570                                                     | 23,000                                     | 33,000                                        | 66,000                                        | 66,000                                                      | <1 U        | --      | <1 U         | --      | <1.0 U       | --      | <1 U         | --      | <1 U        | --      | <1 U         | --      |
| TRICHLOROETHYLENE          | 79-01-6    | 5.0 (A)                                          | 5.0 (A)                                             | 29 (X)                                                       | 2,200                                                                                          | 4,900                                                                                             | 1,100,000               | 0.073 (M)                                                                   | 0.14 (M)                                                | 6.1                                        | 18                                            | 12                                            | 24                                                          | NM          | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | NM          | --      | NM           | --      |
| XYLENE - TOTAL             | 1330-20-7  | 280 (E,I)                                        | 280 (E,I)                                           | 49 (I)                                                       | 190,000 (I,S)                                                                                  | 190,000 (I,S)                                                                                     | 186,000 (I)             | 75 (J)                                                                      | 120 (J)                                                 | 1,200 (J)                                  | 3,600 (J)                                     | 3,500 (J)                                     | 7,100 (J)                                                   | <3 U        | --      | <3 U         | --      | ND           | --      | <0 U         | --      | <3 U        | --      | <3 U         | --      |
| Other                      |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |         |              |         |              |         |              |         |             |         |              |         |
| CHLORIDE (mg/l)            | 16887-00-6 | 250,000 (E)                                      | 250,000 (E)                                         | 50 (FF)                                                      | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <10 U       | --      | NM           | --      | NM           | --      | NM           | --      | 40          | --      | NM           | --      |
| NITROGEN (mg/l)            | 7727-37-9  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | NM           | --      | NM           | --      | NM          | --      | NM           | --      |
| HYDROCARBONS, TOTAL (mg/l) | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | NM           | --      | NM           | --      | NM          | --      | NM           | --      |
| Water Quality Parameters   |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |         |              |         |              |         |              |         |             |         |              |         |
| TEMPERATURE (°C)           | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | 18.3         | --      | 16           | --      | NM          | --      | NM           | --      |
| CONDUCTIVITY (mS/cm)       | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | 0.256        | --      | 0.334        | --      | NM          | --      | NM           | --      |
| DISSOLVED OXYGEN (%)       | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | 8.4          | --      | 17.9         | --      | NM          | --      | NM           | --      |
| pH                         | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | 6.56         | --      | 4.38         | --      | NM          | --      | NM           | --      |
| TURBIDITY (nTu)            | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | 160          | --      | 14.8         | --      | NM          | --      | NM           | --      |

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 6-2  
Summary of Groundwater Analytical Results  
Area B  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code                      |            | EGLE Part 201 Generic Cleanup Criteria           |                                                     |                                                              |                                                                                                |                                                                                                   |                         | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                                         |                                            |                                               |                                               |                                                             | Area B      |         |              |         |              |         |              |         |                 |         |              |         |               |         |               |         |
|------------------------------------|------------|--------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------|-----------------------------------------------|-----------------------------------------------|-------------------------------------------------------------|-------------|---------|--------------|---------|--------------|---------|--------------|---------|-----------------|---------|--------------|---------|---------------|---------|---------------|---------|
| Station Name                       | CAS Number | [1]<br>Residential<br>Drinking Water<br>Criteria | [2]<br>Nonresidential<br>Drinking Water<br>Criteria | [3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [4]<br>Residential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [5]<br>Nonresidential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [6]<br>Water Solubility | [8]<br>Shallow<br>Groundwater<br>Residential<br>MSSL                        | [9]<br>Shallow<br>Groundwater<br>Nonresidential<br>MSSL | [10]<br>Groundwater<br>Residential<br>MSSL | [11]<br>Groundwater<br>Residential TS<br>MSSL | [12]<br>Groundwater<br>Nonresidential<br>MSSL | [13]<br>Groundwater<br>Nonresidential<br>MSSL <sub>12</sub> | MW-505      |         |              |         |              |         |              |         |                 |         | QMCP-GW07    |         | QMCP-GW67     |         | QMCP-GW68     |         |
| Field Sample ID                    |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 8786 MW-505 |         | MW-505 10140 |         | QMCP MW-505  |         | QMCP-MW-505  |         | QMCP-MW-505-DUF |         | QMCP-GW7 3-7 |         | QMCP-GW67 3-7 |         | QMCP-GW68 3-7 |         |
| Sample Date                        |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 10/11/1996  |         | 7/9/1998     |         | 9/6/2018     |         | 9/23/2020    |         | 9/23/2020       |         | 9/11/2018    |         | 9/11/2018     |         | 9/11/2018     |         |
| Sample Interval (bgs)              |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | --          |         | --           |         | 2.5 - 7.5 ft |         | 2.5 - 7.5 ft |         | 2.5 - 7.5 ft    |         | 3 - 7 ft     |         | 3 - 7 ft      |         | 3 - 7 ft      |         |
|                                    |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | Result      | Exceeds | Result       | Exceeds | Result       | Exceeds | Result       | Exceeds | Result          | Exceeds | Result       | Exceeds | Result        | Exceeds | Result        | Exceeds |
| Inorganics - Metals (ug/l)         |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |         |              |         |              |         |              |         |                 |         |              |         |               |         |               |         |
| ARSENIC                            | 7440-38-2  | 10 (A)                                           | 10 (A)                                              | 10                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | 2.4          | --      | NM           | --      | NM              | --      | NM           | --      | NM            | --      | NM            | --      |
| BARIUM                             | 7440-39-3  | 2,000 (A,B)                                      | 2,000 (A,B)                                         | 200 (B,G)                                                    | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | 54           | --      | NM           | --      | NM              | --      | NM           | --      | NM            | --      | NM            | --      |
| CADMIUM                            | 7440-43-9  | 5.0 (A,B)                                        | 5.0 (A,B)                                           | 1.3 (B,G,X)                                                  | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | <0.2 U       | --      | NM           | --      | NM              | --      | <0.2 U       | --      | 0.4           | --      | <0.2 U        | --      |
| CALCIUM                            | 7440-70-2  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | 34,000       | --      | NM           | --      | NM              | --      | NM           | --      | NM            | --      | NM            | --      |
| CHROMIUM                           | 7440-47-3  | 100 (A,B,H)                                      | 100 (A,B,H)                                         | 40 (B,G,H,X)                                                 | NA                                                                                             | NLV                                                                                               | NLV                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | <1.0 U       | --      | NM           | --      | NM              | --      | 7.4          | --      | 42            | [3]     | 5.3           | --      |
| COPPER                             | 7440-50-8  | 4.0 (B,E)                                        | 4.0 (B,E)                                           | 14 (B,G)                                                     | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | 98           | [3]     | NM           | --      | NM              | --      | NM           | --      | NM            | --      | NM            | --      |
| LEAD                               | 7439-92-1  | 4.0 (B,L)                                        | 4.0 (B,L)                                           | 14 (B,G,X)                                                   | NVL                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 4           | --      | 5.0          | [1,2]   | 1.1          | --      | NM           | --      | NM              | --      | 12           | [1,2]   | 180           | [1,2,3] | 14            | [1,2]   |
| MAGNESIUM                          | 7439-95-4  | 400,000 (B)                                      | 1,100,000 (B)                                       | NA                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | 5,300        | --      | NM           | --      | NM              | --      | NM           | --      | NM            | --      | NM            | --      |
| MANGANESE                          | 7439-96-5  | 50 (B,E)                                         | 50 (B,E)                                            | 1,000 (B,G,X)                                                | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | NM           | --      | NM           | --      | NM              | --      | NM           | --      | NM            | --      | NM            | --      |
| MERCURY                            | 7439-97-6  | 2.0 (A,B,Z)                                      | 2.0 (A,B,Z)                                         | 0.0013 (B,Z)                                                 | 56 (B,S,Z)                                                                                     | 56 (B,S,Z)                                                                                        | 56 (B,Z)                | 0.088                                                                       | 0.14                                                    | 1.4                                        | 4.3                                           | 4.3                                           | 8.5                                                         | NM          | --      | NM           | --      | <0.2 U       | --      | NM           | --      | NM              | --      | NM           | --      | NM            | --      | NM            | --      |
| POTASSIUM                          | 7440-09-7  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | 3,100        | --      | NM           | --      | NM              | --      | NM           | --      | NM            | --      | NM            | --      |
| SELENIUM                           | 7782-49-2  | 50 (A,B)                                         | 50 (A,B)                                            | 5 (B)                                                        | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | <1.0 U       | --      | NM           | --      | NM              | --      | NM           | --      | NM            | --      | NM            | --      |
| SILVER                             | 7440-22-4  | 34 (B)                                           | 98 (B)                                              | 0.2 (B,M)                                                    | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | <0.2 U       | --      | NM           | --      | NM              | --      | NM           | --      | NM            | --      | NM            | --      |
| SODIUM                             | 7440-23-5  | 230,000 (HH)                                     | 350,000                                             | NA                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | 35,000       | --      | NM           | --      | NM              | --      | NM           | --      | NM            | --      | NM            | --      |
| STRONTIUM                          | 7440-24-6  | 4,600 (B)                                        | 13,000 (B)                                          | 21,000 (B)                                                   | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | NM           | --      | NM           | --      | NM              | --      | NM           | --      | NM            | --      | NM            | --      |
| ZINC                               | 7440-66-6  | 2,400 (B)                                        | 5,000 (B,E)                                         | 63 (B,G)                                                     | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | <5.0 U       | --      | NM           | --      | NM              | --      | NM           | --      | NM            | --      | NM            | --      |
| Organics - PCBs as Aroclors (ug/l) |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |         |              |         |              |         |              |         |                 |         |              |         |               |         |               |         |
| TOTAL PCBs                         | 1336-36-6  | 0.5 (A,J,T)                                      | 0.5 (A,J,T)                                         | 0.2 (J,M,T)                                                  | 45 (J,S,T)                                                                                     | 45 (J,S,T)                                                                                        | 44.7 (J,T)              | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | NM           | --      | NM           | --      | NM              | --      | NM           | --      | NM            | --      | NM            | --      |
| Organics - SVOCs (ug/l)            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |         |              |         |              |         |              |         |                 |         |              |         |               |         |               |         |
| 2-METHYLNAPHTHALENE (SVOC)         | 91-57-6S   | 260                                              | 750                                                 | 19                                                           | 25,000 (S)                                                                                     | 25,000 (S)                                                                                        | 24,600                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | <5.0 U       | --      | <5 U         | --      | <5 U            | --      | <5.0 U       | --      | <5 UJ         | --      | <5.1 U        | --      |
| ACENAPHTHENE                       | 83-32-9    | 1,300                                            | 3,800                                               | 38                                                           | 4,200 (S)                                                                                      | 4,200 (S)                                                                                         | 4,240                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | <1 U            | --      | <1.0 U       | --      | 2.8 J         | --      | <1.0 U        | --      |
| ACENAPHTHYLENE                     | 208-96-8   | 52                                               | 150                                                 | ID                                                           | 3,900 (S)                                                                                      | 3,900 (S)                                                                                         | 3,930                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | <1 U            | --      | <1.0 U       | --      | <1 UJ         | --      | <1.0 U        | --      |
| ANTHRACENE                         | 120-12-7   | 43 (S)                                           | 43 (S)                                              | ID                                                           | 43 (S)                                                                                         | 43 (S)                                                                                            | 43.4                    | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | <1 U            | --      | <1.0 U       | --      | 11 J          | --      | <1.0 U        | --      |
| BENZO(A)ANTHRACENE                 | 56-55-3    | 2.1 (Q)                                          | 8.5 (Q)                                             | ID                                                           | NLV                                                                                            | NLV                                                                                               | 9.4 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | <1 U            | --      | <1.0 U       | --      | 23 J          | [1,2,6] | <1.0 U        | --      |
| BENZO(A)PYRENE                     | 50-32-8    | 5.0 (A,Q)                                        | 5.0 (A,Q)                                           | ID                                                           | NLV                                                                                            | NLV                                                                                               | 1.62 (Q)                | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | <1 U            | --      | <1.0 U       | --      | 19 J          | [1,2,6] | <1.0 U        | --      |
| BENZO(B)FLUORANTHENE               | 205-99-2   | 1.5 (Q,S,AA)                                     | 1.5 (Q,S,AA)                                        | ID                                                           | ID                                                                                             | ID                                                                                                | 1.5 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | <1 U            | --      | <1.0 U       | --      | 30 J          | [1,2,6] | <1.0 U        | --      |
| BENZO(G,H,I)PERYLENE               | 191-24-2   | 1.0 (M)                                          | 1.0 (M)                                             | ID                                                           | NLV                                                                                            | NLV                                                                                               | 0.26                    | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | <1 U            | --      | <1.0 U       | --      | 4.2 J         | [1,2,6] | <1.0 U        | --      |
| BENZO(K)FLUORANTHENE               | 207-08-9   | 1.0 (M,Q)                                        | 1.0 (M,Q)                                           | NA                                                           | NLV                                                                                            | NLV                                                                                               | 0.8 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | <1 U            | --      | <1.0 U       | --      | 12 J          | [1,2,6] | <1.0 U        | --      |
| CHRYSENE                           | 218-01-9   | 1.6 (Q,S)                                        | 1.6 (Q,S)                                           | ID                                                           | ID                                                                                             | ID                                                                                                | 1.6 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | <1 U            | --      | <1.0 U       | --      | 21 J          | [1,2,6] | <1.0 U        | --      |
| FLUORANTHENE                       | 206-44-0   | 210 (S)                                          | 210 (S)                                             | 1.6                                                          | 210 (S)                                                                                        | 210 (S)                                                                                           | 206                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | <1 U            | --      | <1.0 U       | --      | 46 J          | [3]     | <1.0 U        | --      |
| FLUORENE                           | 86-73-7    | 880                                              | 2,000 (S)                                           | 12                                                           | 2,000 (S)                                                                                      | 2,000 (S)                                                                                         | 1,980                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | <1 U            | --      | <1.0 U       | --      | 3.8 J         | --      | <1.0 U        | --      |
| INDENO(1,2,3-CD)PYRENE             | 193-39-5   | 2.0 (M,Q)                                        | 2.0 (M,Q)                                           | ID                                                           | NLV                                                                                            | NLV                                                                                               | 0.022 (Q)               | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | NM           | --      | <2.0 U       | --      | <2 U         | --      | <2 U            | --      | <2.0 U       | --      | 4.5 J         | [1,2,6] | <2.0 U        | --      |
| NAPHTHALENE (SVOC)                 | 91-20-3S   | 520                                              | 1,500                                               | 11                                                           | 31,000 (S)                                                                                     | 31,000 (S)                                                                                        | 31,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | <1 U            | --      | <1.0 U       | --      | 2.3 J         | --      | <1.0 U        | --      |
| PENTACHLOROPHENOL                  | 87-86-5    | 1.0 (A)                                          | 1.0 (A)                                             | 1.8 (G,X)                                                    | NLV                                                                                            | NLV                                                                                               | 1.85E+06                | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | NM           | --      | NM           | --      | NM              | --      | NM           | --      | NM            | --      | NM            | --      |
| PHENANTHRENE                       | 85-01-8    | 52                                               | 150                                                 | 2.0 (M)                                                      | 1,000 (S)                                                                                      | 1,000 (S)                                                                                         | 1,000                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | <1 U            | --      | <1.0 U       | --      | 39 J          | [3]     | <1.0 U        | --      |
| PYRENE                             | 129-00-0   | 140 (S)                                          | 140 (S)                                             | ID                                                           | 140 (S)                                                                                        | 140 (S)                                                                                           | 135                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U        | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | <1 U            | --      | <1.0 U       | --      | 36 J          | --      | <1.0 U        | --      |

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 6-2  
Summary of Groundwater Analytical Results  
Area B  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code              |            | EGLE Part 201 Generic Cleanup Criteria           |                                                     |                                                              |                                                                                                |                                                                                                   |                         | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                                         |                                            |                                               |                                               |                                                             |             | Area B  |              |         |              |         |              |         |                 |         |              |         |               |         |               |         |
|----------------------------|------------|--------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------|-----------------------------------------------|-----------------------------------------------|-------------------------------------------------------------|-------------|---------|--------------|---------|--------------|---------|--------------|---------|-----------------|---------|--------------|---------|---------------|---------|---------------|---------|
| Station Name               | CAS Number | [1]<br>Residential<br>Drinking Water<br>Criteria | [2]<br>Nonresidential<br>Drinking Water<br>Criteria | [3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [4]<br>Residential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [5]<br>Nonresidential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [6]<br>Water Solubility | [8]<br>Shallow<br>Groundwater<br>Residential<br>MSSL                        | [9]<br>Shallow<br>Groundwater<br>Nonresidential<br>MSSL | [10]<br>Groundwater<br>Residential<br>MSSL | [11]<br>Groundwater<br>Residential TS<br>MSSL | [12]<br>Groundwater<br>Nonresidential<br>MSSL | [13]<br>Groundwater<br>Nonresidential<br>MSSL <sub>12</sub> | MW-505      |         |              |         |              |         |              |         | QMCP-GW07       |         | QMCP-GW67    |         | QMCP-GW68     |         |               |         |
| Field Sample ID            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 8786 MW-505 |         | MW-505 10140 |         | QMCP MW-505  |         | QMCP-MW-505  |         | QMCP-MW-505-DUF |         | QMCP-GW7 3-7 |         | QMCP-GW67 3-7 |         | QMCP-GW68 3-7 |         |
| Sample Date                |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 10/11/1996  |         | 7/9/1998     |         | 9/6/2018     |         | 9/23/2020    |         | 9/23/2020       |         | 9/11/2018    |         | 9/11/2018     |         | 9/11/2018     |         |
| Sample Interval (bgs)      |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | --          |         | --           |         | 2.5 - 7.5 ft |         | 2.5 - 7.5 ft |         | 2.5 - 7.5 ft    |         | 3 - 7 ft     |         | 3 - 7 ft      |         | 3 - 7 ft      |         |
|                            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | Result      | Exceeds | Result       | Exceeds | Result       | Exceeds | Result       | Exceeds | Result          | Exceeds | Result       | Exceeds | Result        | Exceeds | Result        | Exceeds |
| Organics - VOCs (ug/l)     |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |         |              |         |              |         |              |         |                 |         |              |         |               |         |               |         |
| 1,1,1-TRICHLOROETHANE      | 71-55-6    | 200 (A)                                          | 200 (A)                                             | 89                                                           | 660,000                                                                                        | 1,300,000 (S)                                                                                     | 1,330,000               | 180                                                                         | 500                                                     | 8,600                                      | 8,600                                         | 24,000                                        | 24,000                                                      | NM          | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | <1 U            | --      | <1.0 U       | --      | <1.0 U        | --      | <1.0 U        | --      |
| 1,2,3-TRIMETHYLBENZENE     | 526-73-8   | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | 43 (JT)                                                                     | 67 (JT)                                                 | 800 (JT)                                   | 2,400 (JT)                                    | 2,300 (JT)                                    | 4,700 (JT)                                                  | NM          | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | <1 U            | --      | <1.0 U       | --      | <1.0 U        | --      | <1.0 U        | --      |
| 1,2,4-TRIMETHYLBENZENE     | 95-63-6    | 63 (E,I)                                         | 63 (E,I)                                            | 17 (I)                                                       | 56,000 (I,S)                                                                                   | 56,000 (I,S)                                                                                      | 55,890 (I)              | 25 (JT)                                                                     | 44 (JT)                                                 | 440 (JT)                                   | 1,300 (JT)                                    | 1,300 (JT)                                    | 2,600 (JT)                                                  | NM          | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | <1 U            | --      | <1.0 U       | --      | <1.0 U        | --      | <1.0 U        | --      |
| 1,3,5-TRIMETHYLBENZENE     | 108-67-8   | 72 (E,I)                                         | 72 (E,I)                                            | 45 (I)                                                       | 61,000 (I,S)                                                                                   | 61,000 (I,S)                                                                                      | 61,150 (I)              | 18 (JT)                                                                     | 30 (JT)                                                 | 310 (JT)                                   | 940 (JT)                                      | 920 (JT)                                      | 1,800 (JT)                                                  | NM          | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | <1 U            | --      | <1.0 U       | --      | <1.0 U        | --      | <1.0 U        | --      |
| 2-METHYLNAPHTHALENE (VOC)  | 91-57-6V   | 260                                              | 750                                                 | 19                                                           | 25,000 (S)                                                                                     | 25,000 (S)                                                                                        | 24,600                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | <5.0 U       | --      | <5 U         | --      | <5 U            | --      | <5.0 U       | --      | <5.0 U        | --      | <5.0 U        | --      |
| ACETONE                    | 67-64-1    | 730 (I)                                          | 2100 (I)                                            | 1700 (I)                                                     | 1.0E+9 (D,I,S)                                                                                 | 1.0E+9 (D,I,S)                                                                                    | 1.0E+9 (I)              | 50,000                                                                      | 62,000                                                  | 1.20E+07                                   | 1.20E+07                                      | 2.50E+07                                      | 2.50E+07                                                    | NM          | --      | NM           | --      | <20 U        | --      | <20 U        | --      | <20 U           | --      | <20 U        | --      | <20 U         | --      | <20 U         | --      |
| BENZENE                    | 71-43-2    | 5.0 (A,I)                                        | 5.0 (A,I)                                           | 12 (I,X)                                                     | 5,600 (I)                                                                                      | 35,000 (I)                                                                                        | 1,750,000 (I)           | 1                                                                           | 2.7                                                     | 14                                         | 82                                            | 66                                            | 130                                                         | <5 U        | --      | <5 U         | --      | <1.0 U       | --      | <1 U         | --      | <1 U            | --      | <1.0 U       | --      | <1.0 U        | --      | <1.0 U        | --      |
| CYCLOHEXANE                | 110-82-7   | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | <5.0 U       | --      | <5 U         | --      | <5 U            | --      | <5.0 U       | --      | <5.0 U        | --      | <5.0 U        | --      |
| ETHYLBENZENE               | 100-41-4   | 74 (E,I)                                         | 74 (E,I)                                            | 18 (I)                                                       | 110,000 (I)                                                                                    | 170,000 (I,S)                                                                                     | 169,000 (I)             | 2.8                                                                         | 7.6                                                     | 45                                         | 450                                           | 210                                           | 420                                                         | <1 U        | --      | <1 U         | --      | <1.0 U       | --      | <1 U         | --      | <1 U            | --      | <1.0 U       | --      | <1.0 U        | --      | <1.0 U        | --      |
| HEXANE                     | 110-54-3   | 3,000                                            | 8,600                                               | NA                                                           | 12,000 (S)                                                                                     | 12,000 (S)                                                                                        | 12,000                  | 29                                                                          | 85                                                      | 29 (GW)                                    | 33                                            | 85 (GW)                                       | 170 (GW)                                                    | NM          | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | <1 U            | --      | <1.0 U       | --      | <1.0 U        | --      | <1.0 U        | --      |
| ISOPROPYLBENZENE           | 98-82-8    | 800                                              | 2,300                                               | 28                                                           | 56,000 (S)                                                                                     | 56,000 (S)                                                                                        | 56,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | <1 U            | --      | <1.0 U       | --      | <1.0 U        | --      | <1.0 U        | --      |
| M,P-XYLENE                 | 1330-20-7  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | <2.0 U       | --      | <2 U         | --      | <2 U            | --      | <2.0 U       | --      | <2.0 U        | --      | <2.0 U        | --      |
| NAPHTHALENE (VOC)          | 91-20-3V   | 520                                              | 1,500                                               | 11                                                           | 31,000 (S)                                                                                     | 31,000 (S)                                                                                        | 31,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | <5.0 U       | --      | <5 U         | --      | <5 U            | --      | <5.0 U       | --      | <5.0 U        | --      | <5.0 U        | --      |
| N-PROPYLBENZENE            | 103-65-1   | 80 (I)                                           | 230 (I)                                             | ID                                                           | ID                                                                                             | ID                                                                                                | NA                      | 43                                                                          | 83                                                      | 4100                                       | 12000                                         | 8100                                          | 8100                                                        | NM          | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | <1 U            | --      | <1.0 U       | --      | <1.0 U        | --      | <1.0 U        | --      |
| O-XYLENE                   | 95-47-6    | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | <1 U            | --      | <1.0 U       | --      | <1.0 U        | --      | <1.0 U        | --      |
| TETRACHLOROETHYLENE        | 127-18-4   | 5.0 (A)                                          | 5.0 (A)                                             | 11 (X)                                                       | 25,000                                                                                         | 170,000                                                                                           | 200,000                 | 1.5                                                                         | 3                                                       | 96                                         | 96                                            | 190                                           | 380                                                         | NM          | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | <1 U            | --      | <1.0 U       | --      | <1.0 U        | --      | <1.0 U        | --      |
| TOLUENE                    | 108-88-3   | 790 (E,I)                                        | 790 (E,I)                                           | 270 (I)                                                      | 530,000 (I,S)                                                                                  | 530,000 (I,S)                                                                                     | 526,000 (I)             | 300                                                                         | 570                                                     | 23,000                                     | 33,000                                        | 66,000                                        | 66,000                                                      | <1 U        | --      | <1 U         | --      | <1.0 U       | --      | <1 U         | --      | <1 U            | --      | <1.0 U       | --      | <1.0 U        | --      | <1.0 U        | --      |
| TRICHLOROETHYLENE          | 79-01-6    | 5.0 (A)                                          | 5.0 (A)                                             | 29 (X)                                                       | 2,200                                                                                          | 4,900                                                                                             | 1,100,000               | 0.073 (M)                                                                   | 0.14 (M)                                                | 6.1                                        | 18                                            | 12                                            | 24                                                          | NM          | --      | NM           | --      | <1.0 U       | --      | <1 U         | --      | <1 U            | --      | <1.0 U       | --      | <1.0 U        | --      | <1.0 U        | --      |
| XYLENE - TOTAL             | 1330-20-7  | 280 (E,I)                                        | 280 (E,I)                                           | 49 (I)                                                       | 190,000 (I,S)                                                                                  | 190,000 (I,S)                                                                                     | 186,000 (I)             | 75 (J)                                                                      | 120 (J)                                                 | 1,200 (J)                                  | 3,600 (J)                                     | 3,500 (J)                                     | 7,100 (J)                                                   | <3 U        | --      | <3 U         | --      | ND           | --      | <0 U         | --      | <0 U            | --      | ND           | --      | ND            | --      | ND            | --      |
| Other                      |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |         |              |         |              |         |              |         |                 |         |              |         |               |         |               |         |
| CHLORIDE (mg/l)            | 16887-00-6 | 250,000 (E)                                      | 250,000 (E)                                         | 50 (FF)                                                      | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 30          | --      | NM           | --      | NM           | --      | NM           | --      | NM              | --      | NM           | --      | NM            | --      | NM            | --      |
| NITROGEN (mg/l)            | 7727-37-9  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | NM           | --      | NM           | --      | NM              | --      | NM           | --      | NM            | --      | NM            | --      |
| HYDROCARBONS, TOTAL (mg/l) | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | NM           | --      | NM           | --      | NM              | --      | NM           | --      | NM            | --      | NM            | --      |
| Water Quality Parameters   |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |             |         |              |         |              |         |              |         |                 |         |              |         |               |         |               |         |
| TEMPERATURE (°C)           | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | 17.5         | --      | 16.7         | --      | 16.7            | --      | NM           | --      | NM            | --      | NM            | --      |
| CONDUCTIVITY (mS/cm)       | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | 0.320        | --      | 0.290        | --      | 0.290           | --      | NM           | --      | NM            | --      | NM            | --      |
| DISSOLVED OXYGEN (%)       | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | 1.0          | --      | 7.0          | --      | 7.0             | --      | NM           | --      | NM            | --      | NM            | --      |
| pH                         | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | 7.24         | --      | 7.37         | --      | 7.37            | --      | NM           | --      | NM            | --      | NM            | --      |
| TURBIDITY (nTu)            | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM          | --      | NM           | --      | 1.5          | --      | 2.74         | --      | 2.74            | --      | NM           | --      | NM            | --      | NM            | --      |

Note: Analytical and Criteria Footnotes are included on the last page of the table.



TABLE 6-2  
Summary of Groundwater Analytical Results  
Area B  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Groundwater Table Footnotes:

- EGLE Part 201 residential and non-residential generic cleanup criteria and screening levels criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Release Date: December 30, 2013. Updated December 21, 2020.

- Only detected analytes are listed - Gray rows indicate requested analyses. If no analytes are listed below a gray row then all analytes of that group were either not analyzed or not detected.

- **Bold** values are concentrations detected above the laboratory reporting limit.

- **Bold/Shaded** cells indicate analyte concentration exceeded applicable criteria. EGLE Part 201 criteria exceeded is indicated by the footnote in [brackets] following the result value and defined below:

|                                                                                   |                                                    |
|-----------------------------------------------------------------------------------|----------------------------------------------------|
| [1] - Residential Drinking Water Criteria                                         | [8] Shallow Groundwater Residential MSSL           |
| [2] - Nonresidential Drinking Water Criteria                                      | [9] Shallow Groundwater Nonresidential MSSL        |
| [3] - Groundwater Surface Water Interface Criteria                                | [10] Groundwater Residential MSSL                  |
| [4] - Water Solubility                                                            | [11] Groundwater Residential TS MSSL               |
| [5] - Residential Groundwater Volatilization to Indoor Air Inhalation Criteria    | [12] Groundwater Nonresidential MSSL               |
| [6] - Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria | [13] Groundwater Nonresidential MSSL <sub>12</sub> |
| [7] - Flammability and Explosivity Screening Level                                | [14] Groundwater Nonresidential TS MSSL            |

Evaluation based on EGLE Criteria at time of Project completion.

|                                       |                                                                                                     |
|---------------------------------------|-----------------------------------------------------------------------------------------------------|
| -- = No Exceedances                   | mg/l = Milligrams per liter                                                                         |
| ND = Not Detected                     | °C = Degrees Celsius                                                                                |
| NM = Not Measured                     | mS/cm = MilliSiemens per centimeter                                                                 |
| bgs = Below ground surface            | % = Percentage                                                                                      |
| ft = Feet                             | nTu = Nephelometric Turbidity Unit                                                                  |
| PCBs = Polychlorinated biphenyls      | pH = pH acid-base scale                                                                             |
| SVOC = Semi-volatile organic compound | MSSL = Media-Specific Volatilization to Indoor Air Interim Action Screening Level                   |
| VOC = Volatile organic compound       | TS MSSL = Time Sensitive Media-Specific Volatilization to Indoor Air Interim Action Screening Level |
| ug/l = Micrograms per liter           |                                                                                                     |

Groundwater Table Footnotes:

ID = Insufficient data to develop criterion.

NA = A criterion or value is not available

NLV = Hazardous substance is not likely to volatilize under most conditions.

(A) = Criterion is the state of Michigan drinking water standard established pursuant to Section 5 of 1976 PA 399, MCL 325.1005.

(AA) = Use 10,000 ug/l where groundwater enters a structure through the use of a water well, sump or other device. Use 28,000 ug/l for all other uses.

(B) = Background, as defined in R 299.1(b), may be substituted if higher than the calculated cleanup criterion. Background levels may be less than criteria for some inorganic compounds.

(D) = Calculated criterion exceeds 100 percent, hence it is reduced to 100 percent or 1.0E+9 parts per billion (ppb).

(E) = Criterion is the aesthetic drinking water value, as required by Section 20120a(5) of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA). A notice of aesthetic impact may be employed as an institutional control mechanism if groundwater concentrations exceed the aesthetic drinking water criterion, but do not exceed the applicable health-based drinking water value provided in a table available on the Department of Environment, Great Lakes, and Energy (EGLE) internet web site. (See R 299.49 Footnotes for generic cleanup criteria tables for additional information)

(FF) = The chloride GSI criterion shall be 125 mg/l when the discharge is to surface waters of the state designated as public water supply sources or 50 mg/l when the discharge is to the Great Lakes or connecting waters. Chloride GSI criteria shall not apply for surface waters of the state that are not designated as a public water supply source, however, the total dissolved solids criterion is applicable.

(G) = Groundwater surface water interface (GSI) criterion depends on the pH or water hardness, or both, of the receiving surface water. The final chronic value (FCV) for the protection of aquatic life shall be calculated based on the pH or hardness of the receiving surface water. Where water hardness exceeds 400 mg CaCO<sub>3</sub>/L, use 400 mg CaCO<sub>3</sub>/L for the FCV calculation. The FCV formula provides values in units of ug/L or ppb. The generic GSI criterion is the lesser of the calculated FCV, the wildlife value (WV), and the surface water human non-drinking water value (HNDV). The soil GSI protection criteria for these hazardous substances are the greater of the 20 times the GSI criterion or the GSI soil-water partition values using the GSI criteria developed with the procedure described in this footnote. A spreadsheet that may be used to calculate GSI and GSI protection criteria for (G)-footnoted hazardous substances is available on the Department of Environment, Great Lakes, and Energy (EGLE) internet web site. A hardness value of 47.5 CaCO<sub>3</sub>/L and pH of 7, derived from the Michigan Department of Environmental Quality Draft Site Inspection Report for Lake Linden Operations dated 3/29/13, was used in the footnote G calculation spreadsheet.

(H) = Valence-specific chromium data (Cr III and Cr VI) shall be compared to the corresponding valence-specific cleanup criteria. If both Cr III and Cr VI are present in groundwater, the total concentration of both cannot exceed the drinking water criterion of 100 ug/L. If analytical data are provided for total chromium only, they shall be compared to the cleanup criteria for Cr VI. Cr III soil cleanup criterion for protection of drinking water can only be used at sites where groundwater is prevented from being used as a public water supply, currently and in the future, through an approved land or resource use restriction.

(HH) = The residential criterion for sodium is 230,000 ug/l in accordance with the Sodium Advisory Council recommendation and revised Groundwater Discharge Standards.

(I) = Hazardous substance may exhibit the characteristic of ignitability as defined in 40 C.F.R. §261.21 (revised as of July 1, 2001), which is adopted by reference in these rules and is available for inspection at EGLE, 525 West Allegan Street, Lansing, Michigan. Copies of the regulation may be purchased, at a cost as of the time of adoption of these rules of \$45, from the Superintendent of documents, Government Printing Office, Washington, DC 20401 (stock number 869-044-00155-1), or from the EGLE, Remediation and Redevelopment Division (RRD), 525 West Allegan Street, Lansing, Michigan 48933, at cost.

(J) = Hazardous substance may be present in several isomer forms. Isomer-specific concentrations shall be added together for comparison to criteria.

(L) = Criteria for lead are derived using a biologically based model, as allowed for under Section 20120a(9) of the NREPA, and are not calculated using the algorithms and assumptions specified in pathway-specific rules. The generic residential drinking water criterion of 4 ug/L is linked to the generic residential soil direct contact criterion of 400 mg/kg. A higher concentration in the drinking water, up to the state action level of 15 ug/L, may be allowed as a site-specific remedy and still allow for drinking water use, under Section 20120a(2) and 20120b of the NREPA if soil concentrations are appropriately lower than 400 mg/kg. If a site-specific criterion is approved based on this subdivision, a notice shall be filed on the deed for all property where the groundwater concentrations will exceed 4 ug/L to provide notice of the potential for unacceptable risk if soil or groundwater concentrations increase.

Acceptable combinations of site-specific soil and drinking water concentrations are presented in a table available on the Department of Environment, Great Lakes, and Energy (EGLE) internet web site (See R 299.49 Footnotes for generic cleanup criteria tables for additional information).

(M) = Calculated criterion is below the analytical target detection limit, therefore, the criterion defaults to the target detection limit.

(Q) = Criteria for carcinogenic polycyclic aromatic hydrocarbons were developed using relative potential potencies to benzo(a)pyrene.

(S) = Criterion defaults to the hazardous substance-specific water solubility limit.

(T) = Refer to the federal Toxic Substances Control Act (TSCA), 40 C.F.R. §761, Subpart D and 40 C.F.R. §761, Subpart G, to determine the applicability of TSCA cleanup standards. Subpart D and Subpart G of 40 C.F.R. §761 (July 1, 2001) are adopted by reference in these rules and are available for inspection at the EGLE, 525 West Allegan Street, Lansing, Michigan. Copies of the regulations may be purchased, at a cost as of the time of adoption of these rules of \$55, from the Superintendent of Documents, Government Printing Office, Washington, DC 20401, or from the EGLE, RRD, 525 West Allegan Street, Lansing, Michigan 48933, at cost. Alternatives to compliance with the TSCA standards listed below are possible under 40 C.F.R. §761 Subpart D. New releases may be subject to the standards identified in 40 C.F.R. §761, Subpart G. Use Part 201 soil direct contact cleanup criteria in the published table if TSCA standards are not applicable.

(X) = The GSI criterion shown in the generic cleanup criteria tables is not protective for surface water that is used as a drinking water source. (See R 299.49 Footnotes for generic cleanup criteria tables for additional information.)

(Z) = Mercury is typically measured as total mercury. The generic cleanup criteria, however, are based on data for different species of mercury. Specifically, data for elemental mercury, chemical abstract service (CAS) number 7439976, serve as the basis for the soil volatilization to indoor air criteria, groundwater volatilization to indoor air, and soil inhalation criteria. Data for methyl mercury, CAS number 22967926, serve as the basis for the GSI criterion; and data for mercuric chloride, CAS number 7487947, serve as the basis for the drinking water, groundwater contact, soil direct contact, and the groundwater protection criteria. Comparison to criteria shall be based on species-specific analytical data only if sufficient facility characterization has been conducted to rule out the presence of other species of mercury.

MSSL Footnotes:

GW = The calculated value for a hazardous substance based upon shallow groundwater is considered protective when it is greater than the calculated value for groundwater.

J = Hazardous substance may be present in several isomer forms. Isomer-specific concentrations must be added together for comparison to screening level.

JT = Hazardous substance may be present in several isomer forms. Screening levels may be used for the individual isomer provided that it is the sole isomer detected; however, when multiple isomers are detected in a medium, the isomer-specific concentrations must be added together and compared to the most restrictive screening level of the detected isomers.

Laboratory Footnotes:

U = Analyte analyzed for but not detected above the reported sample reporting limit.



**TABLE 6-2**  
**Summary of Groundwater Analytical Results**  
**Area B**  
**Quincy Mining Company Portage Operations Area**  
**Abandoned Mining Wastes - Torch Lake Non-Superfund Site**

|                                                                                                         | Part 201 Generic Cleanup Criteria Evaluated                                          | Exceedance |
|---------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|------------|
| <b>EGLE Part 201 Generic Cleanup Criteria<br/>(December 2020)</b>                                       | [1] Residential Drinking Water Criteria                                              | YES        |
|                                                                                                         | [2] Nonresidential Drinking Water Criteria                                           | YES        |
|                                                                                                         | [3] Groundwater Surface Water Interface Criteria                                     | YES        |
|                                                                                                         | [4] Residential Groundwater Volatilization to Indoor Air Inhalation Criteria         | YES        |
|                                                                                                         | [5] Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria      | YES        |
|                                                                                                         | [6] Water Solubility                                                                 | YES        |
|                                                                                                         | [7] Flammability and Explosivity Screening                                           | NO         |
| <b>Media-Specific Volatilization to Indoor Air<br/>Interim Action Screening Levels<br/>(March 2021)</b> | [8] Shallow Groundwater Residential Media-Specific Screening Level (MSSL)            | YES        |
|                                                                                                         | [9] Shallow Groundwater Nonresidential MSSL                                          | YES        |
|                                                                                                         | [10] Groundwater Residential MSSL                                                    | YES        |
|                                                                                                         | [11] Groundwater Residential Time Sensitive Media-Specific Screening Level (TS MSSL) | YES        |
|                                                                                                         | [12] Groundwater Nonresidential MSSL                                                 | YES        |
|                                                                                                         | [13] Groundwater Nonresidential MSSL <sub>12</sub>                                   | YES        |
|                                                                                                         | [14] Groundwater Nonresidential TS MSSL <sub>12</sub>                                | NO         |

## 7. DETAILED FINDINGS – AREA E

This Section summarizes the SI results and the subsequent findings for Area E within QMCP derived from implementation of the SAP. The narrative follows the systematic investigative approach outlined in **Section 3**, while providing specific details about the potential human health and ecological risks associated with the historical mining operations in this subarea of QMCP.

### 7.1 SITE INSPECTION AND INVESTIGATION RESULTS

The implementation of the site inspection and investigation activities provided critical lines of evidence that link the historical documentation and the current environmental conditions in and around the Portage Canal. The following subsections present the findings of the inspection and investigation activities and provide correlation, if possible, of mining era operations and their potential impacts on the nearshore and offshore environment of the Portage Canal.

#### 7.1.1 Site Inspection

The site inspection at each subarea included the inventory and locating of historical structures and similar surficial artifacts associated with the former industrial operations in the area. Each subarea was also inspected for potential physical and health hazards that were documented, photographed, and located with a GPS unit. The inventoried hazards were then qualitatively assessed for potential human health and environmental risks to determine if analytical sampling was warranted during the targeted inspection phase of the work.

On September 25, 2018, MSG field team personnel performed reconnaissance activities at Area E. In the cases where access was not requested based on historic operational and investigative findings, property conditions were evaluated from a neighboring property or public right of way where access was permitted.

Therefore, the property parcel known as Area E totaling approximately five acres was visually inspected and observations were recorded from the MDNR trail property. The qualitative assessment of the reconnaissance findings in Area E did not warrant the performance of targeted inspection activities. The following provides a summary of the findings associated with the reconnaissance activities. A copy of the reconnaissance log is provided in **Appendix C, Site Inspections – Reconnaissance Logs, Targeted Inspections & Physical Hazards Inventory**.

##### 7.1.1.1 Reconnaissance

The reconnaissance activities identified darkened stained soil near a residential burn barrel and evidence of rusted metal debris that appeared to be residential in nature that was unearthed by flooding. Potentially abandoned containers or other environmental concerns were not observed during the review of Area E.

#### 7.1.2 Site Investigation

The SI in the QMCP was developed based on a variety of data and information as outlined in **Section 3**. In addition to the historical accounts and documentation, current land use and potential exposure pathways were also taken into consideration when selecting the sampling locations specific to Area E. The following subsections present the outcomes of investigative activities completed in Area E by summarizing the laboratory analytical results and characterizing their impacts on the environmental media in which they were detected.

##### 7.1.2.1 Terrestrial Investigation

Intrusive investigation activities in Area E were generally guided by the findings of historical research, and field observations of potentially impacted soils on MDNR property from an MDNR Surveyor. From a historical standpoint,

the area was adjacent to the location of operations subject to or associated with historic mining practices; however, other historic land used and/or operations are unknown.

COCs in the study area were not generally understood nor previously investigated to fully characterize or address potential organic and inorganic contaminants in soil and groundwater. The following subsections present a summary of the field observations and analytical results derived from the terrestrial sampling activities.

#### 7.1.2.1.1 Field Observations – Soil and Groundwater

Borings within the MDNR trail property were advanced by GSS to 8 or 9 feet ft bgs. Boring locations are depicted on **Figure 7-1, Soil Analytical Results (Area E)**. Soil observations documented on field logs indicate that the subsurface of Area E within the MDNR trail property is generally comprised of medium to coarse brown sand.

During groundwater sampling, temporary well points were established at 4 ft intervals ranging from 4 ft or 5 ft bgs to the bottom of the screened interval. Saturated soil conditions were encountered at a depth of approximately 4 ft bgs. Groundwater quality parameters, including temperature, conductivity, DO, and pH, measured at the time of sample collection were generally considered normal.

#### 7.1.2.1.2 Soil Sampling Results

Terrestrial soil investigation activities were completed at Area E on September 5 and 7, 2018. During the mobilization a total of seven soil samples, including one duplicate, were collected from three soil boring locations and four soil samples, including one duplicate, were collected from three surface soil sampling locations. Samples were generally collected from 0 to 6 inches (in.) and 0.5 to 4 ft bgs. Soil boring and surface soil sampling locations are depicted on **Figure 7-1, Soil Analytical Results (Area E)**. Investigative methodologies and soil sampling techniques were conducted using the procedures outlined in **Section 3**.

All soil samples were analyzed for the parameters identified on **Table 3-1, Sampling and Analysis Summary** of this SI Report. The selection of analytical parameters was generally based upon potential environmental impacts associated with mining era operations in the vicinity of the sampling location or field observations.

The shallow and subsurface soil analytical results for Area E contained one COC (naphthalene) at concentrations at or above applicable regulatory criteria and several COCs above MSSLs.

A detailed summary of soil analytical results collected from Area E is provided in **Table 7-1, Summary of Soil Analytical Results (Area E)**. Soil boring logs are included in **Appendix E, Boring Logs** of this SI Report.

#### 7.1.2.1.3 Groundwater Sampling Results

During the advancement of soil borings in Area E, three (3) temporary groundwater sampling locations were established to characterize groundwater in the area. The temporary monitoring points were installed and sampled using the methodologies presented in **Section 3**. The screened intervals in the groundwater sampling locations were established at 4 ft to 8 ft bgs or 5 ft to 9 ft bgs depending on location. Four (4) groundwater samples were collected, including one duplicate sample. Temporary groundwater sampling locations are depicted on **Figure 7-2, Groundwater Analytical Results (Area E)**.

Collected groundwater samples were analyzed for the parameters identified on **Table 3-1, Sampling and Analysis Summary** of this SI Report. The selection of analytical parameters was generally based upon potential environmental impacts associated with mining era operations in the vicinity of the sampling location or field observations. Mercury was detected in all of the groundwater samples collected from temporary sampling points in Area E at concentrations

above residential and nonresidential MSSLS but not above regulatory criteria. PCBs were not detected in groundwater at Area E nor were any other COCs detected in groundwater above applicable criteria with the exception of metals, which were not evaluated further as discussed in **Section 4.2.5**.

A detailed summary of groundwater analytical results collected from Area E is provided in **Table 7-2, Summary of Groundwater Analytical Results (Area E)**. Groundwater analytical results are depicted on **Figure 7-2, Groundwater Analytical Results (Area E)**. Soil boring logs are included in **Appendix E, Boring Logs** of this SI Report.

## 7.2 NATURE AND EXTENT OF CONTAMINATION

Utilizing the established regulatory criteria presented in **Section 4** for various land use categories and exposure pathways, the laboratory analytical results summarized in the preceding section for Area E were reviewed and compared to EGLE Cleanup Criteria Requirements for Response Activity as applicable for the sampled environmental media.

### 7.2.1 Comprehensive Exposure Assessment

The comparison was completed to determine which ecological and human exposure pathways, risks, and conditions are relevant at Area E. Although not inclusive of relevant pathways where regulatory criteria were not exceeded, the following exposure pathways were determined to be relevant in Area E:

- Risks posed by hazardous substances in soil and the potential for the substances to leach to groundwater that could vent to surface water.

As discussed in **Section 4.2.5**, EGLE drinking water and groundwater/surface water pathway criteria exceedances for metals were excluded from the soil and groundwater evaluation. The rationale for this exclusion is twofold:

- The Project investigation and anticipated response actions are being undertaken pursuant to Part 201 of NREPA, being PA 451 of 1994, as amended. The concentrations of metals in excess of EGLE drinking water and groundwater/surface water pathway criteria are ubiquitous in the study area and are predominantly the result of the presence of stamp sands. Stamp sands are not defined as a hazardous substance nor are subject to regulation under Part 201 unless the property otherwise contains hazardous substances in excess of concentrations that satisfy the cleanup criteria for unrestricted residential use; and,
- The study area is part of OU 2 for which the EPA ROD remedy called for No Action. The EPA's ROD OU 2 includes groundwater, surface water, submerged tailings and sediments in Torch Lake, Portage Lake, the Portage Canal, and other area water bodies. Note that EPA's No Action determination relies on the following to mitigate the effects of stamp sand to the extent practicable:
  - The reduction of stamp sand loading to surface water bodies expected as a result of the remedial action taken at OU 1 and OU 3.
  - Ongoing natural sedimentation and detoxification.
  - Institutional programs and practices controlling potential future exposure to site-affected drinking water which were intended to be administered at the county and state level.
  - The long-term monitoring and the five-year review process monitoring requirements of the remedy selected for OU 1 and OU 3 under the 1992 ROD.

Note that metals criteria for other relevant pathways, and cyanide and organic contaminants for all pathways were included in the evaluation.

Furthermore, as discussed in **Section 4.2.5**, EGLE's MSSLs were not included in the exposure pathway assessment due to unknown anticipated future land use and conditions. The MSSLs were considered for screening and delineation purposes only.

#### 7.2.1.1 Soil Exposure Pathway Assessment

Soil analytical results from Area E identified COC concentrations in soil that were at or above concentrations that trigger a "Facility" designation as defined in Section 20101(1)(s) of the NREPA. The following tables provide an aggregate summary of the soil sample locations with respect to the total number of samples and how they compare to the applicable EGLE Cleanup Criteria for Response Activity under both Residential and Nonresidential exposure scenarios. The tables are based solely on the total number of samples collected from Area E. They list only the number of samples for a specific analytical suite that contained one or more exceedance of a given criterion.

| Soil Analytical Result Summary Table                                 |                         |                    |                    | Cleanup Criteria Requirements for Response Activity – Residential** |                                                         |                                                       |                                                          |                                          |                                          |                                      |                         |                                                |
|----------------------------------------------------------------------|-------------------------|--------------------|--------------------|---------------------------------------------------------------------|---------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------|------------------------------------------|------------------------------------------|--------------------------------------|-------------------------|------------------------------------------------|
|                                                                      | Analytical Summary      |                    |                    | Groundwater Protection                                              |                                                         | Indoor Air                                            | Ambient Air                                              |                                          |                                          |                                      | Contact                 | Csat                                           |
|                                                                      | Total Number of Samples | Detected Analytes* | Total Exceedances* | Residential Drinking Water Protection Criteria                      | Groundwater Surface Water Interface Protection Criteria | Soil Volatilization to Indoor Air Inhalation Criteria | Infinite Source Volatile Soil Inhalation Criteria (VSIC) | Finite VSIC for 5 Meter Source Thickness | Finite VSIC for 2 Meter Source Thickness | Particulate Soil Inhalation Criteria | Direct Contact Criteria | Soil Saturation Concentration Screening Levels |
| Inorganics                                                           | 11                      | 96                 | 0                  | NA*                                                                 | NA*                                                     | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Cyanide                                                              | 4                       | 0                  | 0                  | 0                                                                   | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| VOCs                                                                 | 7                       | 18                 | 0                  | 0                                                                   | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| SVOCs                                                                | 11                      | 44                 | 2                  | 0                                                                   | 2                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Asbestos                                                             | 0                       | 0                  | 0                  | 0                                                                   | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Total PCBs                                                           | 6                       | 0                  | 0                  | 0                                                                   | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Pesticides                                                           | 0                       | 0                  | 0                  | 0                                                                   | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| COCs exceeding applicable regulatory criteria in one or more samples |                         |                    |                    | NAPHTHALENE (SVOC)                                                  |                                                         |                                                       |                                                          |                                          |                                          |                                      |                         |                                                |

NA\* = The EGLE drinking water and groundwater/surface water interface pathway criteria exceedances for metals are excluded from the groundwater evaluation as explained in Section 4.2.5.

\*Denotes total number of specific instances of an analyte being detected or exceeding criteria, can be multiple within one sample location.

\*\*Denotes total number of samples exceeding criteria, cannot be multiple within one sample location.

Total exceedance column does not include MSSLs or non-applicable criteria (DWPC and GSIPC for metals).

| Soil Analytical Result Summary Table                                 | Cleanup Criteria Requirements for Response Activity – Nonresidential** |                    |                    |                                                   |                                                         |                                                       |                                                          |                                          |                                          |                                      |                         |                                                |
|----------------------------------------------------------------------|------------------------------------------------------------------------|--------------------|--------------------|---------------------------------------------------|---------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------|------------------------------------------|------------------------------------------|--------------------------------------|-------------------------|------------------------------------------------|
|                                                                      | Analytical Summary                                                     |                    |                    | Groundwater Protection                            |                                                         | Indoor Air                                            | Ambient Air                                              |                                          |                                          |                                      | Contact                 | Csat                                           |
|                                                                      | Total Number of Samples                                                | Detected Analytes* | Total Exceedances* | Nonresidential Drinking Water Protection Criteria | Groundwater Surface Water Interface Protection Criteria | Soil Volatilization to Indoor Air Inhalation Criteria | Infinite Source Volatile Soil Inhalation Criteria (VSIC) | Finite VSIC for 5 Meter Source Thickness | Finite VSIC for 2 Meter Source Thickness | Particulate Soil Inhalation Criteria | Direct Contact Criteria | Soil Saturation Concentration Screening Levels |
| Inorganics                                                           | 11                                                                     | 96                 | 0                  | NA*                                               | NA*                                                     | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Cyanide                                                              | 4                                                                      | 0                  | 0                  | 0                                                 | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| VOCs                                                                 | 7                                                                      | 18                 | 0                  | 0                                                 | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| SVOCs                                                                | 11                                                                     | 44                 | 2                  | 0                                                 | 2                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Asbestos                                                             | 0                                                                      | 0                  | 0                  | 0                                                 | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Total PCBs                                                           | 6                                                                      | 0                  | 0                  | 0                                                 | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Pesticides                                                           | 0                                                                      | 0                  | 0                  | 0                                                 | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| COCs exceeding applicable regulatory criteria in one or more samples |                                                                        |                    |                    | NAPHTHALENE (SVOC)                                |                                                         |                                                       |                                                          |                                          |                                          |                                      |                         |                                                |

NA\* = The EGLE drinking water and groundwater/surface water interface pathway criteria exceedances for metals are excluded from the groundwater evaluation as explained in Section 4.2.5.

\*Denotes total number of specific instances of an analyte being detected or exceeding criteria, can be multiple within one sample location.

\*\*Denotes total number of samples exceeding criteria, cannot be multiple within one sample location.

Total exceedance column does not include MSSLS or non-applicable criteria (DWPC and GSIPC for metals).

#### 7.2.1.2 Groundwater Exposure Pathway Assessment

Groundwater analytical results from Area E did not identify COC concentrations in groundwater that were at or above concentrations that trigger a “Facility” designation as defined in Section 20101(1)(s) of the NREPA. Similar to the preceding soil tables, the following table provides a summary of the aforementioned sample locations with respect to the total number of samples and how they compare to the applicable EGLE Cleanup Criteria for Response Activity under both Residential and Nonresidential exposure scenarios.

| Groundwater Analytical Result Summary Table                          | Analytical Summary      |                                    |                    | Cleanup Criteria Requirements for Response Activity – Residential and Nonresidential** |                                        |                                              |                                                                          |                                                                             |                  |                                               |
|----------------------------------------------------------------------|-------------------------|------------------------------------|--------------------|----------------------------------------------------------------------------------------|----------------------------------------|----------------------------------------------|--------------------------------------------------------------------------|-----------------------------------------------------------------------------|------------------|-----------------------------------------------|
|                                                                      | Total Number of Samples | Total Number of Detected Analytes* | Total Exceedances* | Residential Drinking Water Criteria                                                    | Nonresidential Drinking Water Criteria | Groundwater Surface Water Interface Criteria | Residential Groundwater Volatilization to Indoor Air Inhalation Criteria | Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria | Water Solubility | Flammability and Explosivity Screening Levels |
| Inorganics                                                           | 4                       | 26                                 | 0                  | NA*                                                                                    | NA*                                    | NA*                                          | 0                                                                        | 0                                                                           | 0                | 0                                             |
| Cyanide                                                              | 0                       | 0                                  | 0                  | 0                                                                                      | 0                                      | 0                                            | 0                                                                        | 0                                                                           | 0                | 0                                             |
| VOCs                                                                 | 4                       | 0                                  | 0                  | 0                                                                                      | 0                                      | 0                                            | 0                                                                        | 0                                                                           | 0                | 0                                             |
| SVOCs                                                                | 4                       | 0                                  | 0                  | 0                                                                                      | 0                                      | 0                                            | 0                                                                        | 0                                                                           | 0                | 0                                             |
| Total PCBs                                                           | 3                       | 0                                  | 0                  | 0                                                                                      | 0                                      | 0                                            | 0                                                                        | 0                                                                           | 0                | 0                                             |
| Pesticides                                                           | 0                       | 0                                  | 0                  | 0                                                                                      | 0                                      | 0                                            | 0                                                                        | 0                                                                           | 0                | 0                                             |
| COCs exceeding applicable regulatory criteria in one or more samples |                         |                                    |                    | Not Applicable                                                                         |                                        |                                              |                                                                          |                                                                             |                  |                                               |

NA\* = The EGLE drinking water and groundwater/surface water interface pathway criteria exceedances for metals are excluded from the groundwater evaluation as explained in Section 4.2.5.

\*Denotes total number of specific instances of an analyte being detected or exceeding criteria, can be multiple within one sample location.

\*\*Denotes total number of samples exceeding criteria, cannot be multiple within one sample location.

Total exceedance column does not include MSSLS or non-applicable criteria (DWC and GSIC for metals).

## 7.2.2 Extent of Contamination

The comparison of analytical results to applicable regulatory criteria indicates that potential human health and ecological risks are present in soil and groundwater in Area E. Recalling the goals and objectives of the SI, the following subsections describe the extent of contamination in environmental media in the study area.

### 7.2.2.1 Soil Extent of Contamination

Soil analytical results exceeded GSIPC and residential and nonresidential MSSLS within Area E. Naphthalene was detected at concentrations exceeding GSIPC near the approximate location of contaminated soil reported by an MDNR surveyor. While not exceeding regulatory criteria, mercury and certain VOCs were also detected at concentrations exceeding MSSLS.

All samples were collected from surface and subsurface soil intervals from areas that are generally accessible to the public despite being private or municipally-owned properties. The sampling locations were within approximately 100 ft to 350 ft of the shoreline of the Portage Canal and all but two were located on the publicly accessed MDNR trail property.



The extent of contaminated soils has not been fully delineated within Area E. Elevated concentrations of inorganic and organic contaminants potentially include exposure risks related to inhalation pathways, which must be a consideration when evaluating land use, property accessibility, and the extent of contamination in surface and near surface soils that could be encountered through normal use of the property.

The remaining exposure risks are generally related to the leaching of SVOCs to groundwater and their potential impacts on surface water. These risks pose a long-term threat to the overall environmental health of the watershed. The widespread distribution of inorganic COCs throughout the region limit determinations related to the extent of metals contamination in Area E. Nevertheless, risks are posed to groundwater and surface water and are a factor when evaluating the extent of soil contamination in Area E.

#### 7.2.2.2 *Groundwater Extent of Contamination*

Groundwater analytical results exceeded shallow groundwater MSSLS for residential and nonresidential exposure scenarios and the residential groundwater MSSL for mercury. The mercury concentrations did not exceed regulatory criteria.

No other analyzed constituents were detected above criteria or screening levels within Area E. The groundwater sampling locations were established in a zone roughly 100 ft to 250 ft from the shoreline of the Portage Canal at depths of approximately 4 ft to 9 ft bgs.

### 7.3 **CONCLUSIONS AND RECOMMENDATIONS**

The analytical results and interpretation summarized in the preceding subsections document potential human health and ecological risks that are present in Area E. The following subsections provide a synopsis of these findings and a recommended path forward for mitigating these risks in Area E.

#### 7.3.1 **Conclusions**

Environmental impacts in Area E are generally characterized by detections of organic and inorganic contaminants in soil and groundwater. Although specific sources of these contaminants may not be fully understood, historical research related to the operations nearby provided substantive evidence for selecting target analytes anticipated to be present within the study area and MDNR surveyor observations provided input on a specific area to assess.

The analytical results from SI activities summarized above provide analytical data and lines of evidence to conclude that the study area is a "Facility" as defined in Section 20101(1)(s) of the NREPA based on the detection of naphthalene exceeding GSIPC. The following table provides a summary of the affected environmental media, applicable regulatory criteria, and potential receptors within Area E.

| Area E – Media, Criteria, Potential Receptor Summary                 |                           |                                     |                |                           |                                     |                              |                |                        |            |               |              |                                                        |                              |               |
|----------------------------------------------------------------------|---------------------------|-------------------------------------|----------------|---------------------------|-------------------------------------|------------------------------|----------------|------------------------|------------|---------------|--------------|--------------------------------------------------------|------------------------------|---------------|
| Media                                                                | Soil                      |                                     |                | Groundwater               |                                     |                              | Air            |                        | Sediment   | Surface Water |              | Building Materials, Asbestos, and Abandoned Containers |                              |               |
| Criteria                                                             | Drinking Water Protection | Groundwater Surface Water Interface | Direct Contact | Drinking Water Protection | Groundwater Surface Water Interface | Flammability and Explosivity | Volatilization | Particulate Inhalation | Ecological | Ecological    | Human Health | Particulate Inhalation                                 | Flammability and Explosivity | Environmental |
| Potential Receptor                                                   |                           |                                     |                |                           |                                     |                              |                |                        |            |               |              |                                                        |                              |               |
| Residential Human                                                    |                           | ✓                                   |                |                           |                                     |                              |                |                        |            |               |              |                                                        |                              |               |
| Nonresidential Human                                                 |                           | ✓                                   |                |                           |                                     |                              |                |                        |            |               |              |                                                        |                              |               |
| Water Column Organism                                                |                           |                                     |                |                           |                                     |                              |                |                        |            |               |              |                                                        |                              |               |
| Benthic Organism                                                     |                           |                                     |                |                           |                                     |                              |                |                        |            |               |              |                                                        |                              |               |
| COCs exceeding applicable regulatory criteria in one or more samples |                           |                                     |                | NAPHTHALENE (SVOC)        |                                     |                              |                |                        |            |               |              |                                                        |                              |               |

In addition to the evaluation of analytical results from Area E, the following provides a summary of findings derived from the assessment of Area E with respect to the goals and objectives for the Project:

- Terrestrial sources of contamination are present in the form of VOCs, SVOCs, and limited inorganic COCs in the study area. Due the limited availability of historic and current SI analytical data, the extent of contamination in Area E has not been fully investigated, defined, or addressed.
- Soil impacts on the MDNR trail property exceeded GSIPC and MSSSLs for residential and nonresidential scenarios but did not exceed PSIC or DCC.

### 7.3.2 Recommendations

The conclusions outlined in the preceding subsection establish that Area E is a Part 201 Facility. Section 20107a of Part 201 of NREPA describes the duties of owners or operators of a Facility, regardless of their liability, including: prevent unacceptable exposures, prevent exacerbation, and take reasonable precautions against the foreseeable actions of third parties. Some exceptions may apply; in any case, owners and operators of contaminated properties should become familiar with Section 20107a and the associated Rules.

## FIGURES

### DETAILED FINDINGS REPORT – AREA E





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## TABLES

### DETAILED FINDINGS REPORT – AREA E



TABLE 7-1  
Summary of Soil Analytical Results  
Area E  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code                |            | EGLE Part 201 Generic Cleanup Criteria                         |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                             | Area E  |                                                    |           |                                                    |           |                                                    |           |                             |           |                                                    |           |                                                    |           |                                                    |           |                                                   |         |                                          |         |                                          |           |                                                    |         |
|------------------------------|------------|----------------------------------------------------------------|-------------------------------------------------------|---------------------------------------------------------------------------------|---------------------------------------------------------|---------------------------------------------|-----------------------------------------------------------|-------------------------------------------------------------|------------------------------------------------|-------------------------------|-----------------------------------------------------------------------------|-----------------------------|---------|----------------------------------------------------|-----------|----------------------------------------------------|-----------|----------------------------------------------------|-----------|-----------------------------|-----------|----------------------------------------------------|-----------|----------------------------------------------------|-----------|----------------------------------------------------|-----------|---------------------------------------------------|---------|------------------------------------------|---------|------------------------------------------|-----------|----------------------------------------------------|---------|
| Station Name                 | CAS Number | [2]<br>Groundwater Surface Water Interface Protection Criteria | [4]<br>Residential Drinking Water Protection Criteria | [5]<br>Residential Soil Volatilization to Indoor Air Inhalation Criteria (VSIC) | [9]<br>Residential Particulate Soil Inhalation Criteria | [10]<br>Residential Direct Contact Criteria | [11]<br>Nonresidential Drinking Water Protection Criteria | [16]<br>Nonresidential Particulate Soil Inhalation Criteria | [17]<br>Nonresidential Direct Contact Criteria | [18]<br>Soil Residential MSSL | [19]<br>Soil Nonresidential MSSL                                            | QMCP-SB20                   |         |                                                    |           | QMCP-SB21                                          |           |                                                    |           | QMCP-SB61                   |           |                                                    |           |                                                    |           | QMCP-SS06                                          |           | QMCP-SS08                                         |         |                                          |         | QMCP-SS09                                |           |                                                    |         |
| Field Sample ID              |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             | QMCP-SB 20 0in-6in          |         | QMCP-SB 20 6in-4ft                                 |           | QMCP-SB 21 0in-6in                                 |           | QMCP-SB 21 6in-4ft                                 |           | QMCP-SB 61 0in-6in          |           | QMCP-SB 61 6in-4ft                                 |           | QMCP-SB 61 6in-4ft DUP                             |           | QMCP-SS-06-0-6in                                   |           | QMCP-SS-08-0-6in                                  |         | QMCP-SS-08-0-6in DUP1                    |         | QMCP-SS-09-0-6in                         |           |                                                    |         |
| Sample Date                  |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             | 9/7/2018                    |         | 9/7/2018                                           |           | 9/7/2018                                           |           | 9/7/2018                                           |           | 9/7/2018                    |           | 9/7/2018                                           |           | 9/7/2018                                           |           | 9/5/2018                                           |           | 9/5/2018                                          |         | 9/5/2018                                 |         | 9/5/2018                                 |           |                                                    |         |
| Sample Interval (bgs)        |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             | 0 - 0.5 ft                  |         | 0.5 - 4 ft                                         |           | 0 - 0.5 ft                                         |           | 0.5 - 4 ft                                         |           | 0 - 0.5 ft                  |           | 0.5 - 4 ft                                         |           | 0.5 - 4 ft                                         |           | 0 - 0.5 ft                                         |           | 0 - 0.5 ft                                        |         | 0 - 0.5 ft                               |         | 0 - 0.5 ft                               |           |                                                    |         |
| Sample Description           |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             | SAND, Fine to medium, brown |         | SAND, Medium to coarse, brown, saturated at 4 feet |           | SAND, Medium to coarse, brown, saturated at 4 feet |           | SAND, Medium to coarse, brown, saturated at 4 feet |           | SAND, Fine to medium, brown |           | SAND, Medium to coarse, brown, saturated at 4 feet |           | SAND, Medium to coarse, brown, saturated at 4 feet |           | SAND, Medium to coarse, brown, saturated at 4 feet |           | Black stamp SAND, fine grained, darkened staining |         | Brown medium SAND, black darker staining |         | Brown medium SAND, black darker staining |           | Red coarse stamp SAND with darkened finer stamp SA |         |
|                              |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             | Result                      | Exceeds | Result                                             | Exceeds   | Result                                             | Exceeds   | Result                                             | Exceeds   | Result                      | Exceeds   | Result                                             | Exceeds   | Result                                             | Exceeds   | Result                                             | Exceeds   | Result                                            | Exceeds | Result                                   | Exceeds | Result                                   | Exceeds   | Result                                             | Exceeds |
| Inorganics - Metals (mg/kg)  |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             |                             |         |                                                    |           |                                                    |           |                                                    |           |                             |           |                                                    |           |                                                    |           |                                                    |           |                                                   |         |                                          |         |                                          |           |                                                    |         |
| ALUMINUM                     | 7429-90-5  | NA                                                             | 6900 (B)                                              | NLV                                                                             | ID                                                      | 50,000 (D,BB)                               | 6,900 (B)                                                 | ID                                                          | 3.7E+5 (D,BB)                                  | NA                            | NA                                                                          | NM                          | --      | NM                                                 | --        | NM                                                 | --        | NM                                                 | --        | NM                          | --        | NM                                                 | --        | NM                                                 | --        | NM                                                 | --        | NM                                                | --      | NM                                       | --      | NM                                       | --        |                                                    |         |
| ANTIMONY                     | 7440-36-0  | 1.2 (X)                                                        | 4.3                                                   | NLV                                                                             | 13,000                                                  | 180                                         | 4.3                                                       | 5,900                                                       | 670                                            | NA                            | NA                                                                          | NM                          | --      | NM                                                 | --        | NM                                                 | --        | NM                                                 | --        | NM                          | --        | NM                                                 | --        | NM                                                 | --        | NM                                                 | --        | NM                                                | --      | NM                                       | --      | NM                                       | --        |                                                    |         |
| ARSENIC                      | 7440-38-2  | 4.6                                                            | 4.6                                                   | NLV                                                                             | 720                                                     | 7.6                                         | 4.6                                                       | 910                                                         | 37                                             | NA                            | NA                                                                          | 2                           | --      | 0.8                                                | --        | 1.9                                                | --        | 3.7                                                | --        | 3                           | --        | 1.1                                                | --        | 1.3                                                | --        | 2                                                  | --        | 4.6                                               | --      | 3.1                                      | --      | 3                                        | --        |                                                    |         |
| BARIUM                       | 7440-39-3  | 130 (B,G)                                                      | 1,300 (B)                                             | NLV                                                                             | 3.3E+5 (B)                                              | 37,000 (B)                                  | 1,300 (B)                                                 | 1.5E+5 (B)                                                  | 1.3E+5 (B)                                     | NA                            | NA                                                                          | NM                          | --      | NM                                                 | --        | NM                                                 | --        | NM                                                 | --        | NM                          | --        | NM                                                 | --        | NM                                                 | --        | 6.1                                                | --        | 51                                                | --      | 48                                       | --      | 110                                      | --        |                                                    |         |
| BERYLLIUM                    | 7440-41-7  | 24 (G)                                                         | 51                                                    | NLV                                                                             | 1,300                                                   | 410                                         | 51                                                        | 590                                                         | 1,600                                          | NA                            | NA                                                                          | NM                          | --      | NM                                                 | --        | NM                                                 | --        | NM                                                 | --        | NM                          | --        | NM                                                 | --        | NM                                                 | --        | NM                                                 | --        | NM                                                | --      | NM                                       | --      | NM                                       | --        |                                                    |         |
| CADMIUM                      | 7440-43-9  | 1.6 (B,G,X)                                                    | 6.0 (B)                                               | NLV                                                                             | 1,700 (B)                                               | 550 (B)                                     | 6.0 (B)                                                   | 2,200 (B)                                                   | 2,100 (B)                                      | NA                            | NA                                                                          | <0.2 U                      | --      | <0.2 U                                             | --        | 0.3                                                | --        | 0.3                                                | --        | 0.3                         | --        | <0.2 U                                             | --        | <0.2 U                                             | --        | <0.2 U                                             | --        | <0.2 U                                            | --      | <0.2 U                                   | --      | 2.5                                      | [2]       |                                                    |         |
| CALCIUM                      | 7440-70-2  | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | NM                          | --      | NM                                                 | --        | NM                                                 | --        | NM                                                 | --        | NM                          | --        | NM                                                 | --        | NM                                                 | --        | NM                                                 | --        | NM                                                | --      | NM                                       | --      | NM                                       | --        |                                                    |         |
| CHROMIUM                     | 7440-47-3  | 1.2E+6 (B,G,H,X)                                               | 1.0E+6 (B,D,H)                                        | NLV                                                                             | 3.30E+8 (B,H)                                           | 7.90E+5 (B,H)                               | 1.00E+6 (B,D,H)                                           | 1.50E+5 (B,H)                                               | 1.00E+6 (B,D,H)                                | NA                            | NA                                                                          | 11                          | --      | 19                                                 | --        | 19                                                 | --        | 21                                                 | --        | 16                          | --        | 18                                                 | --        | 17                                                 | --        | 8.1                                                | --        | 3.2                                               | --      | 4.4                                      | --      | 21                                       | --        |                                                    |         |
| COBALT                       | 7440-48-4  | 2                                                              | 0.8                                                   | NLV                                                                             | 13,000                                                  | 2,600                                       | 2                                                         | 5,900                                                       | 9,000                                          | NA                            | NA                                                                          | NM                          | --      | NM                                                 | --        | NM                                                 | --        | NM                                                 | --        | NM                          | --        | NM                                                 | --        | NM                                                 | --        | NM                                                 | --        | NM                                                | --      | NM                                       | --      | NM                                       | --        |                                                    |         |
| COPPER                       | 7440-50-8  | 32 (B,G)                                                       | 5,800 (B)                                             | NLV                                                                             | 130,000 (B)                                             | 20,000 (B)                                  | 5,800 (B)                                                 | 59,000 (B)                                                  | 73,000 (B)                                     | NA                            | NA                                                                          | 350                         | [2]     | 6,300                                              | [2,4,11]  | 3,900                                              | [2]       | 2,400                                              | [2]       | 2,400                       | [2]       | 9,100                                              | [2,4,11]  | 5,400                                              | [2]       | 3,500                                              | [2]       | 460                                               | [2]     | 290                                      | [2]     | 4,500                                    | [2]       |                                                    |         |
| IRON                         | 7439-89-6  | --                                                             | 12,000 (B)                                            | NLV                                                                             | ID                                                      | 160,000 (B)                                 | 12,000 (B)                                                | ID                                                          | 580,000 (B)                                    | NA                            | NA                                                                          | NM                          | --      | NM                                                 | --        | NM                                                 | --        | NM                                                 | --        | NM                          | --        | NM                                                 | --        | NM                                                 | --        | NM                                                 | --        | NM                                                | --      | NM                                       | --      | NM                                       | --        |                                                    |         |
| LEAD                         | 7439-92-1  | 2,500 (B,G,X)                                                  | 700 (B)                                               | NLV                                                                             | 100,000 (B)                                             | 400 (B)                                     | 700 (B)                                                   | 44,000 (B)                                                  | 900 (B,DD)                                     | NA                            | NA                                                                          | 18                          | --      | 8.5                                                | --        | 37                                                 | --        | 47                                                 | --        | 39                          | --        | 11                                                 | --        | 15                                                 | --        | 15                                                 | --        | 100                                               | --      | 73                                       | --      | 180                                      | --        |                                                    |         |
| LITHIUM                      | 7439-93-2  | 9.8 (B)                                                        | 9.8 (B)                                               | NLV                                                                             | 2.30E+9 (B)                                             | 4,200 (B,DD)                                | 9.8 (B)                                                   | 1.00E+6 (B)                                                 | 31,000 (B,DD)                                  | NA                            | NA                                                                          | NM                          | --      | NM                                                 | --        | NM                                                 | --        | NM                                                 | --        | NM                          | --        | NM                                                 | --        | NM                                                 | --        | NM                                                 | --        | NM                                                | --      | NM                                       | --      | NM                                       | --        |                                                    |         |
| MAGNESIUM                    | 7439-95-4  | --                                                             | 8,000 (B)                                             | NLV                                                                             | 6.70E+6 (B)                                             | 1.0E+9 (B,D)                                | 22,000 (B)                                                | 2.90E+6 (B)                                                 | 1.00E+6 (B,D)                                  | NA                            | NA                                                                          | NM                          | --      | NM                                                 | --        | NM                                                 | --        | NM                                                 | --        | NM                          | --        | NM                                                 | --        | NM                                                 | --        | NM                                                 | --        | NM                                                | --      | NM                                       | --      | NM                                       | --        |                                                    |         |
| MANGANESE                    | 7439-96-5  | 440 (B,G,X)                                                    | 440 (B)                                               | NLV                                                                             | 3,300 (B)                                               | 25,000 (B)                                  | 440 (B)                                                   | 1,500 (B)                                                   | 90,000 (B)                                     | NA                            | NA                                                                          | 240                         | --      | 620                                                | [2,4,11]  | 600                                                | [2,4,11]  | 570                                                | [2,4,11]  | 500                         | [2,4,11]  | 630                                                | [2,4,11]  | 610                                                | [2,4,11]  | 330                                                | --        | 170                                               | --      | 97                                       | --      | 870                                      | [2,4,11]  |                                                    |         |
| MERCURY                      | 7439-97-6  | 0.13 (B,Z)                                                     | 1.7 (B,Z)                                             | 48 (B,Z)                                                                        | 20,000 (B,Z)                                            | 160 (B,Z)                                   | 1.7 (B,Z)                                                 | 8,800 (B,Z)                                                 | 580 (B,Z)                                      | 0.022 (M)                     | 0.066                                                                       | 0.1                         | [18,19] | 0.5                                                | [2,18,19] | 0.4                                                | [2,18,19] | 0.2                                                | [2,18,19] | 0.2                         | [2,18,19] | 0.4                                                | [2,18,19] | 0.7                                                | [2,18,19] | 0.4                                                | [2,18,19] | <0.06 U                                           | --      | 0.07                                     | [18,19] | 0.2                                      | [2,18,19] |                                                    |         |
| NICKEL                       | 7440-02-0  | 29 (G)                                                         | 100 (B)                                               | NLV                                                                             | 13,000 (B)                                              | 40,000 (B)                                  | 100 (B)                                                   | 16,000 (B)                                                  | 1.50E+5 (B)                                    | NA                            | NA                                                                          | NM                          | --      | NM                                                 | --        | NM                                                 | --        | NM                                                 | --        | NM                          | --        | NM                                                 | --        | NM                                                 | --        | NM                                                 | --        | NM                                                | --      | NM                                       | --      | NM                                       | --        |                                                    |         |
| POTASSIUM                    | 7440-09-7  | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | NM                          | --      | NM                                                 | --        | NM                                                 | --        | NM                                                 | --        | NM                          | --        | NM                                                 | --        | NM                                                 | --        | NM                                                 | --        | NM                                                | --      | NM                                       | --      | NM                                       | --        |                                                    |         |
| SELENIUM                     | 7782-49-2  | 0.41 (B)                                                       | 4.0 (B)                                               | NLV                                                                             | 130,000 (B)                                             | 2,600 (B)                                   | 4.0 (B)                                                   | 59,000 (B)                                                  | 9,600 (B)                                      | NA                            | NA                                                                          | NM                          | --      | NM                                                 | --        | NM                                                 | --        | NM                                                 | --        | NM                          | --        | NM                                                 | --        | NM                                                 | --        | <0.2 U                                             | --        | <0.2 U                                            | --      | 0.2                                      | --      | <0.2 U                                   | --        |                                                    |         |
| SILVER                       | 7440-22-4  | 1.0 (B,M)                                                      | 4.5 (B)                                               | NLV                                                                             | 6700 (B)                                                | 2500 (B)                                    | 13 (B)                                                    | 2,900 (B)                                                   | 9,000 (B)                                      | NA                            | NA                                                                          | 0.5                         | --      | 6.8                                                | [2,4]     | 4.5                                                | [2]       | 4.1                                                | [2]       | 4.9                         | [2,4]     | 21                                                 | [2,4,11]  | 7.1                                                | [2,4]     | 2.9                                                | [2]       | 0.7                                               | --      | 0.6                                      | --      | 4.3                                      | [2]       |                                                    |         |
| SODIUM                       | 7440-23-5  | NA                                                             | 4,600                                                 | NLV                                                                             | ID                                                      | 1.0E+6 (D)                                  | NA                                                        | ID                                                          | 1.0E+6 (D)                                     | NA                            | NA                                                                          | NM                          | --      | NM                                                 | --        | NM                                                 | --        | NM                                                 | --        | NM                          | --        | NM                                                 | --        | NM                                                 | --        | NM                                                 | --        | NM                                                | --      | NM                                       | --      | NM                                       | --        |                                                    |         |
| VANADIUM                     | 7440-62-2  | 430                                                            | 72                                                    | NLV                                                                             | ID                                                      | 750 (DD)                                    | 990                                                       | ID                                                          | 5,500 (DD)                                     | NA                            | NA                                                                          | NM                          | --      | NM                                                 | --        | NM                                                 | --        | NM                                                 | --        | NM                          | --        | NM                                                 | --        | NM                                                 | --        | NM                                                 | --        | NM                                                | --      | NM                                       | --      | NM                                       | --        |                                                    |         |
| ZINC                         | 7440-66-6  | 62 (B,G)                                                       | 2,400 (B)                                             | NLV                                                                             | ID                                                      | 1.70E+5 (B)                                 | 5,000 (B)                                                 | ID                                                          | 6.30E+5 (B)                                    | NA                            | NA                                                                          | 37                          | --      | 74                                                 | [2]       | 100                                                | [2]       | 140                                                | [2]       | 110                         | [2]       | 80                                                 | [2]       | 81                                                 | [2]       | 43                                                 | --        | 31                                                | --      | 21                                       | --      | 190                                      | [2]       |                                                    |         |
| Inorganics - Cyanide (mg/kg) |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             |                             |         |                                                    |           |                                                    |           |                                                    |           |                             |           |                                                    |           |                                                    |           |                                                    |           |                                                   |         |                                          |         |                                          |           |                                                    |         |
| CYANIDE                      | 57-12-5    | 0.1 (P,R)                                                      | 4.0 (P,R)                                             | NLV                                                                             | 250 (P,R)                                               | 12 (P,R)                                    | 4.0 (P,R)                                                 | 250 (P,R)                                                   | 250 (P,R)                                      | NA                            | NA                                                                          | NM                          | --      | NM                                                 | --        | NM                                                 | --        | NM                                                 | --        | NM                          | --        | NM                                                 | --        | NM                                                 | --        | <0.11 U                                            | --        | <0.13 U                                           | --      | <0.13 U                                  | --      | <0.12 U                                  | --        |                                                    |         |
| Organics - PCBs (ug/kg)      |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             |                             |         |                                                    |           |                                                    |           |                                                    |           |                             |           |                                                    |           |                                                    |           |                                                    |           |                                                   |         |                                          |         |                                          |           |                                                    |         |
| AROCOLOR-1260                | 11096-82-5 | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | <120 U                      | --      | <110 U                                             | --        | NM                                                 | --        | NM                                                 | --        | <170 U                      | --        | <110 U                                             | --        | <130 U                                             | --        | NM                                                 | --        | NM                                                | --      | NM                                       | --      | <120 U                                   | --        |                                                    |         |
| AROCOLOR-1262                | 37324-23-5 | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | <120 U                      | --      | <110 U                                             | --        | NM                                                 | --        | NM                                                 | --        | <170 U                      | --        | <110 U                                             | --        | <130 U                                             | --        | NM                                                 | --        | NM                                                | --      | NM                                       | --      | <120 U                                   | --        |                                                    |         |
| TOTAL PCBs                   | 1336-36-6  | NLL                                                            | NLL                                                   | 3.00E+6 (J,T)                                                                   | 5.20E+6 (J,T)                                           | 1,000 (J,T)                                 | NLL                                                       | 6.50E+6 (J,T)                                               | 1,000 (J,T)                                    | NA                            | NA                                                                          | ND                          | --      | ND                                                 | --        | NM                                                 | --        | NM                                                 | --        | ND                          | --        | ND                                                 | --        | ND                                                 | --        | NM                                                 | --        | NM                                                | --      | NM                                       | --      | ND                                       | --        |                                                    |         |
| Organics - SVOCs (ug/kg)     |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             |                             |         |                                                    |           |                                                    |           |                                                    |           |                             |           |                                                    |           |                                                    |           |                                                    |           |                                                   |         |                                          |         |                                          |           |                                                    |         |
| 1,1-BIPHENYL                 | 92-52-4    | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | NM                          | --      | NM                                                 | --        | NM                                                 | --        | NM                                                 | --        | NM                          | --        | NM                                                 | --        | NM                                                 | --        | NM                                                 | --        | NM                                                | --      | NM                                       | --      | NM                                       | --        |                                                    |         |
| 2-METHYLNAPHTHALENE (SVOC)   | 91-57-6S   | 4,200                                                          | 57,000                                                | 2.70E+06                                                                        | 6.70E+08                                                | 8.10E+06                                    | 1.70E+05                                                  | 2.90E+08                                                    | 2.60E+07                                       | NA                            | NA                                                                          | <1500 U                     | --      | <550 U                                             | --        | <550 U                                             | --        | <560 U                                             | --        | 920                         | --        | <560 U                                             | --        | <550 U                                             | --        | 710                                                | --        | 1,100                                             | --      | 1,300                                    | --      | <590 U                                   | --        |                                                    |         |
| ACENAPHTHENE                 | 83-32-9    | 8,700                                                          | 3.00E+05                                              | 1.90E+08                                                                        | 1.40E+10                                                | 4.10E+07                                    | 8.80E+05                                                  | 6.20E+09                                                    | 1.30E+08                                       | NA                            | NA                                                                          | <600 U                      | --      | <220 U                                             | --        | <220 U                                             | --        | <220 U                                             | --        | <220 U                      | --        | <220 U                                             | --        | <220 U                                             | --        | <220 U                                             | --        | <250 U                                            | --      | <250 U                                   | --      | <230 U                                   | --        |                                                    |         |
| ACENAPHTHYLENE               | 208-96-8   | ID                                                             | 5,900                                                 | 1.60E+06                                                                        | 2.30E+09                                                | 1.60E+06                                    | 17,000                                                    | 1.00E+09                                                    | 5.20E+06                                       | NA                            | NA                                                                          | <600 U                      | --      | <220 U                                             | --        | <220 U                                             | --        | <220 U                                             | --        | <220 U                      | --        | <220 U                                             | --        | <220 U                                             | --        | <220 U                                             | --        | <250 U                                            | --      | <250 U                                   | --      | <230 U                                   | --        |                                                    |         |
| ACETOPHENONE                 | 98-86-2    | ID                                                             | 30,000                                                | 1.20E+8 (C)                                                                     | 3.30E+10                                                | 4.70E+7 (C)                                 | 88,000                                                    | 1.40E+10                                                    | 1.50E+8 (C)                                    | NA                            | NA                                                                          | NM                          | --      | NM                                                 | --        | NM                                                 | --        | NM                                                 | --        | NM                          | --        | NM                                                 | --        | NM                                                 | --        | NM                                                 | --        | NM                                                | --      | NM                                       | --      | NM                                       | --        |                                                    |         |
| ANTHRACENE                   | 120-12-7   | ID                                                             | 41,000                                                | 1.00E+9 (D)                                                                     | 6.70E+10                                                | 2.30E+08                                    | 41,000                                                    | 2.90E+10                                                    | 7.30E+08                                       | NA                            | NA                                                                          | <600 U                      | --      | <220 U                                             | --        | <220 U                                             | --        | <220 U                                             | --        | <220 U                      | --        | <220 U                                             | --        | <220 U                                             | --        | <220 U                                             | --        | <250 U                                            | --      | <250 U                                   | --      | <230 U                                   | --        |                                                    |         |
| BENZALDEHYDE                 | 100-52-7   | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | NM                          | --      | NM                                                 | --        | NM                                                 | --        | NM                                                 | --        | NM                          | --        | NM                                                 | --        | NM                                                 | --        | NM                                                 | --        | NM                                                | --      | NM                                       | --      | NM                                       | --        |                                                    |         |
| BENZO(A)ANTHRACENE           | 56-55-3    | NLL                                                            | NLL                                                   | NLV                                                                             | ID                                                      | 20,000 (Q)                                  | NLL                                                       | ID                                                          | 80,000 (Q)                                     | NA                            | NA                                                                          | <600 U                      | --      | <220 U                                             | --        | 280                                                | --        | <220 U                                             | --        | 380                         | --        | <220 U                                             | --        | <220 U                                             | --        | <220 U                                             | --        | 290                                               | --      | 360                                      | --      | 350                                      | --        |                                                    |         |
| BENZO(A)PYRENE               | 50-32-8    | NLL                                                            | NLL                                                   | NLV                                                                             | 1.50E+8 (Q)                                             | 2,000 (Q)                                   | NLL                                                       | 1.90E+6 (Q)                                                 | 8,000 (Q)                                      | NA                            | NA                                                                          | <1200 U                     | --      | <440 U                                             | --        | <440 U                                             | --        | <450 U                                             | --        | <450 U                      | --        | <450 U                                             | --        | <440 U                                             | --        | <430 U                                             | --        | <510 U                                            | --      | <510 U                                   | --      | <470 U                                   | --        |                                                    |         |

TABLE 7-1  
Summary of Soil Analytical Results  
Area E  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code                      |            | EGLE Part 201 Generic Cleanup Criteria                         |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                             | Area E  |                                                    |         |                                                    |         |                                                    |         |                             |         |                                                    |         |                                                    |         |                                                    |         |                                                   |         |                                          |         |                                          |         |                                                    |         |
|------------------------------------|------------|----------------------------------------------------------------|-------------------------------------------------------|---------------------------------------------------------------------------------|---------------------------------------------------------|---------------------------------------------|-----------------------------------------------------------|-------------------------------------------------------------|------------------------------------------------|-------------------------------|-----------------------------------------------------------------------------|-----------------------------|---------|----------------------------------------------------|---------|----------------------------------------------------|---------|----------------------------------------------------|---------|-----------------------------|---------|----------------------------------------------------|---------|----------------------------------------------------|---------|----------------------------------------------------|---------|---------------------------------------------------|---------|------------------------------------------|---------|------------------------------------------|---------|----------------------------------------------------|---------|
| Station Name                       | CAS Number | [2]<br>Groundwater Surface Water Interface Protection Criteria | [4]<br>Residential Drinking Water Protection Criteria | [5]<br>Residential Soil Volatilization to Indoor Air Inhalation Criteria (VSIC) | [9]<br>Residential Particulate Soil Inhalation Criteria | [10]<br>Residential Direct Contact Criteria | [11]<br>Nonresidential Drinking Water Protection Criteria | [16]<br>Nonresidential Particulate Soil Inhalation Criteria | [17]<br>Nonresidential Direct Contact Criteria | [18]<br>Soil Residential MSSL | [19]<br>Soil Nonresidential MSSL                                            | QMCP-SB20                   |         |                                                    |         | QMCP-SB21                                          |         |                                                    |         | QMCP-SB61                   |         |                                                    |         |                                                    |         | QMCP-SS06                                          |         | QMCP-SS08                                         |         |                                          |         | QMCP-SS09                                |         |                                                    |         |
| Field Sample ID                    |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             | QMCP-SB 20 0in-6in          |         | QMCP-SB 20 6in-4ft                                 |         | QMCP-SB 21 0in-6in                                 |         | QMCP-SB 21 6in-4ft                                 |         | QMCP-SB 61 0in-6in          |         | QMCP-SB 61 6in-4ft                                 |         | QMCP-SB 61 6in-4ft DUP                             |         | QMCP-SS-06-0-6in                                   |         | QMCP-SS-08-0-6in                                  |         | QMCP-SS-08-0-6in DUP1                    |         | QMCP-SS-09-0-6in                         |         |                                                    |         |
| Sample Date                        |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             | 9/7/2018                    |         | 9/7/2018                                           |         | 9/7/2018                                           |         | 9/7/2018                                           |         | 9/7/2018                    |         | 9/7/2018                                           |         | 9/7/2018                                           |         | 9/5/2018                                           |         | 9/5/2018                                          |         | 9/5/2018                                 |         | 9/5/2018                                 |         |                                                    |         |
| Sample Interval (bgs)              |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             | 0 - 0.5 ft                  |         | 0.5 - 4 ft                                         |         | 0 - 0.5 ft                                         |         | 0.5 - 4 ft                                         |         | 0 - 0.5 ft                  |         | 0.5 - 4 ft                                         |         | 0.5 - 4 ft                                         |         | 0 - 0.5 ft                                         |         | 0 - 0.5 ft                                        |         | 0 - 0.5 ft                               |         | 0 - 0.5 ft                               |         |                                                    |         |
| Sample Description                 |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             | SAND, Fine to medium, brown |         | SAND, Medium to coarse, brown, saturated at 4 feet |         | SAND, Medium to coarse, brown, saturated at 4 feet |         | SAND, Medium to coarse, brown, saturated at 4 feet |         | SAND, Fine to medium, brown |         | SAND, Medium to coarse, brown, saturated at 4 feet |         | SAND, Medium to coarse, brown, saturated at 4 feet |         | SAND, Medium to coarse, brown, saturated at 4 feet |         | Black stamp SAND, fine grained, darkened staining |         | Brown medium SAND, black darker staining |         | Brown medium SAND, black darker staining |         | Red coarse stamp SAND with darkened finer stamp SA |         |
|                                    |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             | Result                      | Exceeds | Result                                             | Exceeds | Result                                             | Exceeds | Result                                             | Exceeds | Result                      | Exceeds | Result                                             | Exceeds | Result                                             | Exceeds | Result                                             | Exceeds | Result                                            | Exceeds | Result                                   | Exceeds | Result                                   | Exceeds | Result                                             | Exceeds |
| Organics - SVOCs (ug/kg) Continued |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             |                             |         |                                                    |         |                                                    |         |                                                    |         |                             |         |                                                    |         |                                                    |         |                                                    |         |                                                   |         |                                          |         |                                          |         |                                                    |         |
| DIBENZO(A,H)ANTHRACENE             | 53-70-3    | NLL                                                            | NLL                                                   | NLV                                                                             | ID                                                      | 2,000 (Q)                                   | NLL                                                       | ID                                                          | 8,000 (Q)                                      | NA                            | NA                                                                          | <1200 U                     | --      | <440 U                                             | --      | <440 U                                             | --      | <450 U                                             | --      | <450 U                      | --      | <450 U                                             | --      | <440 U                                             | --      | <430 U                                             | --      | <510 U                                            | --      | <510 U                                   | --      | <470 U                                   | --      |                                                    |         |
| DIBENZOFURAN                       | 132-64-9   | 1,700                                                          | ID                                                    | 2.00E+06                                                                        | 6.70E+06                                                | ID                                          | ID                                                        | 2.90E+06                                                    | ID                                             | NA                            | NA                                                                          | NM                          | --      | NM                                                 | --      | NM                                                 | --      | NM                                                 | --      | NM                          | --      | NM                                                 | --      | NM                                                 | --      | NM                                                 | --      | NM                                                | --      | NM                                       | --      | NM                                       | --      |                                                    |         |
| FLUORANTHENE                       | 206-44-0   | 5,500                                                          | 730,000                                               | 1.00E+9 (D)                                                                     | 9.30E+09                                                | 4.60E+07                                    | 730,000                                                   | 4.10E+09                                                    | 1.30E+08                                       | NA                            | NA                                                                          | 580 J                       | --      | <220 U                                             | --      | 520                                                | --      | 390                                                | --      | 740                         | --      | <220 U                                             | --      | <220 U                                             | --      | <220 U                                             | --      | 510                                               | --      | 710                                      | --      | 580                                      | --      |                                                    |         |
| FLUORENE                           | 86-73-7    | 5,300                                                          | 390,000                                               | 5.80E+08                                                                        | 9.30E+09                                                | 2.70E+07                                    | 890,000                                                   | 4.10E+09                                                    | 8.70E+07                                       | NA                            | NA                                                                          | <600 U                      | --      | <220 U                                             | --      | <220 U                                             | --      | <220 U                                             | --      | <220 U                      | --      | <220 U                                             | --      | <220 U                                             | --      | <220 U                                             | --      | <250 U                                            | --      | <250 U                                   | --      | <230 U                                   | --      |                                                    |         |
| INDENO(1,2,3-CD)PYRENE             | 193-39-5   | NLL                                                            | NLL                                                   | NLV                                                                             | ID                                                      | 20,000 (Q)                                  | NLL                                                       | ID                                                          | 80,000 (Q)                                     | NA                            | NA                                                                          | <1200 U                     | --      | <440 U                                             | --      | <440 U                                             | --      | <450 U                                             | --      | <450 U                      | --      | <450 U                                             | --      | <440 U                                             | --      | <430 U                                             | --      | <510 U                                            | --      | <510 U                                   | --      | <470 U                                   | --      |                                                    |         |
| NAPHTHALENE (SVOC)                 | 91-20-3S   | 730                                                            | 35,000                                                | 2.50E+05                                                                        | 2.00E+08                                                | 1.60E+07                                    | 1.00E+05                                                  | 8.80E+07                                                    | 5.20E+07                                       | NA                            | NA                                                                          | <600 U                      | --      | <220 U                                             | --      | <220 U                                             | --      | <220 U                                             | --      | 680                         | --      | <220 U                                             | --      | 230                                                | --      | 480                                                | --      | 770                                               | [2]     | 890                                      | [2]     | <230 U                                   | --      |                                                    |         |
| PHENANTHRENE                       | 85-01-8    | 2,100                                                          | 56,000                                                | 2.80E+06                                                                        | 6.70E+06                                                | 1.60E+06                                    | 1.60E+05                                                  | 2.90E+06                                                    | 5.20E+06                                       | NA                            | NA                                                                          | <600 U                      | --      | <220 U                                             | --      | 290                                                | --      | <220 U                                             | --      | 670                         | --      | <220 U                                             | --      | <220 U                                             | --      | 430                                                | --      | 860                                               | --      | 990                                      | --      | 330                                      | --      |                                                    |         |
| PYRENE                             | 129-00-0   | ID                                                             | 4.80E+05                                              | 1.00E+9 (D)                                                                     | 6.70E+09                                                | 2.90E+07                                    | 4.80E+05                                                  | 2.90E+09                                                    | 8.40E+07                                       | NA                            | NA                                                                          | 590 J                       | --      | <220 U                                             | --      | 400                                                | --      | 320                                                | --      | 590                         | --      | <220 U                                             | --      | <220 U                                             | --      | <220 U                                             | --      | 470                                               | --      | 610                                      | --      | 550                                      | --      |                                                    |         |
| Organics - VOCs (ug/kg)            |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             |                             |         |                                                    |         |                                                    |         |                                                    |         |                             |         |                                                    |         |                                                    |         |                                                    |         |                                                   |         |                                          |         |                                          |         |                                                    |         |
| 1,2,3-TRIMETHYLBENZENE             | 526-73-8   | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | 270 (JT)                      | 800 (JT)                                                                    | <69 U                       | --      | <62 U                                              | --      | <61 U                                              | --      | <62 U                                              | --      | 80                          | --      | <63 U                                              | --      | <60 U                                              | --      | NM                                                 | --      | NM                                                | --      | NM                                       | --      | NM                                       | --      |                                                    |         |
| 1,2,4-TRIMETHYLBENZENE             | 95-63-6    | 570 (I)                                                        | 2,100 (I)                                             | 4.3E+6 (C,I)                                                                    | 8.20E+10 (I)                                            | 3.2E+07 (C,I)                               | 2,100 (I)                                                 | 3.60E+10 (I)                                                | 1.00E+8 (C,I)                                  | 150 (JT)                      | 430 (JT)                                                                    | <69 U                       | --      | <62 U                                              | --      | 61                                                 | --      | <62 U                                              | --      | 180                         | [18]    | <63 U                                              | --      | 85                                                 | --      | NM                                                 | --      | NM                                                | --      | NM                                       | --      | NM                                       | --      |                                                    |         |
| 1,3,5-TRIMETHYLBENZENE             | 108-67-8   | 1,100 (I)                                                      | 1,800 (I)                                             | 2.6E+6 (C,I)                                                                    | 8.20E+10 (I)                                            | 3.2E+07 (C)                                 | 2,100 (I)                                                 | 3.60E+10 (I)                                                | 1.00E+8 (C,I)                                  | 100 (JT)                      | 300 (JT)                                                                    | <69 U                       | --      | <62 U                                              | --      | <61 U                                              | --      | <62 U                                              | --      | <62 U                       | --      | <63 U                                              | --      | <60 U                                              | --      | NM                                                 | --      | NM                                                | --      | NM                                       | --      | NM                                       | --      |                                                    |         |
| 2,2,4-TRIMETHYLPENTANE             | 540-84-1   | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | <340 U                      | --      | <310 U                                             | --      | <310 U                                             | --      | <310 U                                             | --      | <310 U                      | --      | <310 U                                             | --      | <300 U                                             | --      | NM                                                 | --      | NM                                                | --      | NM                                       | --      | NM                                       | --      |                                                    |         |
| 2-METHYLNAPHTHALENE (VOC)          | 91-57-6V   | 4,200                                                          | 57,000                                                | 2.70E+06                                                                        | 6.70E+08                                                | 8.10E+06                                    | 1.70E+05                                                  | 2.90E+08                                                    | 2.60E+07                                       | NA                            | NA                                                                          | <340 U                      | --      | <310 U                                             | --      | <310 U                                             | --      | <310 U                                             | --      | 440                         | --      | <310 U                                             | --      | <300 U                                             | --      | NM                                                 | --      | NM                                                | --      | NM                                       | --      | NM                                       | --      |                                                    |         |
| BENZENE                            | 71-43-2    | 240 (I,X)                                                      | 100 (I)                                               | 1,600 (I)                                                                       | 3.80E+8 (I)                                             | 1.8E+5 (I)                                  | 100 (I)                                                   | 4.70E+8 (I)                                                 | 8.40E+5 (C,I)                                  | 1.7 (M)                       | 7.9 (M)                                                                     | <69 U                       | --      | <62 U                                              | --      | <61 U                                              | --      | <62 U                                              | --      | <62 U                       | --      | <63 U                                              | --      | <60 U                                              | --      | NM                                                 | --      | NM                                                | --      | NM                                       | --      | NM                                       | --      |                                                    |         |
| CYCLOHEXANE                        | 110-82-7   | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | <340 U                      | --      | <310 U                                             | --      | <310 U                                             | --      | <310 U                                             | --      | <310 U                      | --      | <310 U                                             | --      | <300 U                                             | --      | NM                                                 | --      | NM                                                | --      | NM                                       | --      | NM                                       | --      |                                                    |         |
| ETHYLBENZENE                       | 100-41-4   | 360                                                            | 1,500                                                 | 87,000                                                                          | 1.00E+10                                                | 2.20E+07                                    | 1,500                                                     | 1.30E+10                                                    | 7.10E+07                                       | 12 (M)                        | 57                                                                          | <69 U                       | --      | <62 U                                              | --      | <61 U                                              | --      | <62 U                                              | --      | 84                          | [18,19] | <63 U                                              | --      | <60 U                                              | --      | NM                                                 | --      | NM                                                | --      | NM                                       | --      | NM                                       | --      |                                                    |         |
| HEXANE                             | 110-54-3   | NA                                                             | 1.8E+5 (C)                                            | 5.1E+5 (C)                                                                      | 1.30E+10                                                | 9.2E+7 (C)                                  | 5.10E+5 (C)                                               | 5.90E+09                                                    | 3.00E+8 (C)                                    | 25                            | 74                                                                          | <69 U                       | --      | <62 U                                              | --      | <61 U                                              | --      | <62 U                                              | --      | 75                          | [18,19] | <63 U                                              | --      | <60 U                                              | --      | NM                                                 | --      | NM                                                | --      | NM                                       | --      | NM                                       | --      |                                                    |         |
| ISOPROPYLBENZENE                   | 98-82-8    | 3,200                                                          | 91,000                                                | 4.00E+5 (C)                                                                     | 5.80E+09                                                | 2.50E+7 (C)                                 | 2.60E+05                                                  | 2.60E+09                                                    | 8.00E+7 (C)                                    | NA                            | NA                                                                          | <69 U                       | --      | <62 U                                              | --      | <61 U                                              | --      | <62 U                                              | --      | <62 U                       | --      | <63 U                                              | --      | <60 U                                              | --      | NM                                                 | --      | NM                                                | --      | NM                                       | --      | NM                                       | --      |                                                    |         |
| M,P-XYLENE                         | 1330-20-7  | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | <140 U                      | --      | <120 U                                             | --      | <120 U                                             | --      | <120 U                                             | --      | 370                         | --      | <130 U                                             | --      | 180                                                | --      | NM                                                 | --      | NM                                                | --      | NM                                       | --      | NM                                       | --      |                                                    |         |
| NAPHTHALENE (VOC)                  | 91-20-3V   | 730                                                            | 35,000                                                | 2.50E+05                                                                        | 2.00E+08                                                | 1.60E+07                                    | 1.00E+05                                                  | 8.80E+07                                                    | 5.20E+07                                       | NA                            | NA                                                                          | <340 U                      | --      | <310 U                                             | --      | <310 U                                             | --      | <310 U                                             | --      | 400                         | --      | <310 U                                             | --      | <300 U                                             | --      | NM                                                 | --      | NM                                                | --      | NM                                       | --      | NM                                       | --      |                                                    |         |
| N-PROPYLBENZENE                    | 103-65-1   | ID                                                             | 1,600 (I)                                             | ID                                                                              | 1.30E+9 (I)                                             | 2.50E+6 (I)                                 | 4,600                                                     | 5.90E+08                                                    | 8.00E+06                                       | 1,800                         | 3,500                                                                       | <69 U                       | --      | <62 U                                              | --      | <61 U                                              | --      | <62 U                                              | --      | <62 U                       | --      | <63 U                                              | --      | <60 U                                              | --      | NM                                                 | --      | NM                                                | --      | NM                                       | --      | NM                                       | --      |                                                    |         |
| O-XYLENE                           | 95-47-6    | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | <69 U                       | --      | <62 U                                              | --      | 73                                                 | --      | <62 U                                              | --      | 290                         | --      | <63 U                                              | --      | 110                                                | --      | NM                                                 | --      | NM                                                | --      | NM                                       | --      | NM                                       | --      |                                                    |         |
| P-ISOPROPYL TOLUENE (p-CYMENTHENE) | 99-87-6    | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | NM                          | --      | NM                                                 | --      | NM                                                 | --      | NM                                                 | --      | NM                          | --      | NM                                                 | --      | NM                                                 | --      | NM                                                 | --      | NM                                                | --      | NM                                       | --      | NM                                       | --      |                                                    |         |
| SEC-BUTYLBENZENE                   | 135-98-8   | ID                                                             | 1,600                                                 | ID                                                                              | 4.00E+08                                                | 2.50E+06                                    | 4,600                                                     | 1.80E+08                                                    | 8.00E+06                                       | NA                            | NA                                                                          | <69 U                       | --      | <62 U                                              | --      | <61 U                                              | --      | <62 U                                              | --      | <62 U                       | --      | <63 U                                              | --      | <60 U                                              | --      | NM                                                 | --      | NM                                                | --      | NM                                       | --      | NM                                       | --      |                                                    |         |
| STYRENE                            | 100-42-5   | 530 (X)                                                        | 2,700                                                 | 2.50E+05                                                                        | 5.50E+09                                                | 4.00E+05                                    | 2,700                                                     | 6.90E+09                                                    | 1.90E+6 (C)                                    | NA                            | NA                                                                          | <69 U                       | --      | <62 U                                              | --      | <61 U                                              | --      | <62 U                                              | --      | <62 U                       | --      | <63 U                                              | --      | <60 U                                              | --      | NM                                                 | --      | NM                                                | --      | NM                                       | --      | NM                                       | --      |                                                    |         |
| TETRACHLOROETHYLENE                | 127-18-4   | 220 (X)                                                        | 100                                                   | 11,000                                                                          | 2.70E+09                                                | 2.0E+5 (C)                                  | 100                                                       | 1.20E+09                                                    | 9.30E+5 (C)                                    | 6.2 (M)                       | 12 (M)                                                                      | <69 U                       | --      | <62 U                                              | --      | <61 U                                              | --      | <62 U                                              | --      | <62 U                       | --      | <63 U                                              | --      | <60 U                                              | --      | NM                                                 | --      | NM                                                | --      | NM                                       | --      | NM                                       | --      |                                                    |         |
| TOLUENE                            | 108-88-3   | 5,400 (I)                                                      | 16,000 (I)                                            | 3.30E+5 (C,I)                                                                   | 2.70E+10 (I)                                            | 5E+07 (C,I)                                 | 16,000 (I)                                                | 1.20E+10 (I)                                                | 1.60E+8 (C,I)                                  | 3,700                         | 11,000                                                                      | <69 U                       | --      | <62 U                                              | --      | <61 U                                              | --      | <62 U                                              | --      | 330                         | --      | <63 U                                              | --      | 160                                                | --      | NM                                                 | --      | NM                                                | --      | NM                                       | --      | NM                                       | --      |                                                    |         |
| XYLENE - TOTAL                     | 1330-20-7  | 980 (I)                                                        | 5,600 (I)                                             | 6.30E+6 (I)                                                                     | 2.90E+11 (I)                                            | 4.1E+08 (C,I)                               | 5,600 (I)                                                 | 1.30E+11 (I)                                                | 1.00E+9 (C,D,I)                                | 280 (J)                       | 830 (J)                                                                     | ND                          | --      | ND                                                 | --      | 73                                                 | --      | ND                                                 | --      | 660                         | [18]    | ND                                                 | --      | 290                                                | [18]    | NM                                                 | --      | NM                                                | --      | NM                                       | --      | NM                                       | --      |                                                    |         |
| Organics - Pesticides (ug/kg)      |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             |                             |         |                                                    |         |                                                    |         |                                                    |         |                             |         |                                                    |         |                                                    |         |                                                    |         |                                                   |         |                                          |         |                                          |         |                                                    |         |
| 4,4-DDE                            | 72-55-9    | NLL                                                            | NLL                                                   | NLV                                                                             | 3.20E+07                                                | 45,000                                      | NLL                                                       | 4.00E+07                                                    | 1.90E+05                                       | NA                            | NA                                                                          | NM                          | --      | NM                                                 | --      | NM                                                 | --      | NM                                                 | --      | NM                          | --      | NM                                                 | --      | NM                                                 | --      | NM                                                 | --      | NM                                                | --      | NM                                       | --      | NM                                       | --      |                                                    |         |
| 4,4-DDT                            | 50-29-3    | NLL                                                            | NLL                                                   | NLV                                                                             | 3.20E+07                                                | 57,000                                      | NLL                                                       | 4.00E+07                                                    | 2.80E+05                                       | NA                            | NA                                                                          | NM                          | --      | NM                                                 | --      | NM                                                 | --      | NM                                                 | --      | NM                          | --      | NM                                                 | --      | NM                                                 | --      | NM                                                 | --      | NM                                                | --      | NM                                       | --      | NM                                       | --      |                                                    |         |
| ALDRIN                             | 309-00-2   | NLL                                                            | NLL                                                   | 1.30E+06                                                                        | 6.40E+05                                                | 1,000                                       | NLL                                                       | 8.00E+05                                                    | 4,300                                          | NA                            | NA                                                                          | NM                          | --      | NM                                                 | --      | NM                                                 | --      | NM                                                 | --      | NM                          | --      | NM                                                 | --      | NM                                                 | --      | NM                                                 | --      | NM                                                | --      | NM                                       | --      | NM                                       | --      |                                                    |         |
| ALPHA-CHLORDANE                    | 5103-71-9  | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                            | NA                                                                          | NM                          | --      | NM                                                 | --      | NM                                                 | --      | NM                                                 | --      | NM                          | --      | NM                                                 | --      | NM                                                 | --      | NM                                                 | --      | NM                                                | --      | NM                                       | --      | NM                                       | --      |                                                    |         |
| BETA-BHC                           | 319-85-7   | ID                                                             | 37                                                    | NLV                                                                             | 5.90E+06                                                | 5,400                                       | 150                                                       | 7.40E+06                                                    | 25,000                                         | NA                            | NA                                                                          | NM                          | --      | NM                                                 | --      | NM                                                 | --      | NM                                                 | --      | NM                          | --      | NM                                                 | --      | NM                                                 | --      | NM                                                 | --      | NM                                                | --      | NM                                       | --      | NM                                       | --      |                                                    |         |
| ENDOSULFAN I                       | 959-98-8   | NLL                                                            | NLL                                                   | ID                                                                              | ID                                                      | 1.4E+06 (J)                                 | NLL                                                       | ID                                                          | 4.40E+06 (J)                                   | NA                            | NA                                                                          | NM                          | --      | NM                                                 | --      | NM                                                 | --      | NM                                                 | --      | NM                          | --      | NM                                                 | --      | NM                                                 | --      | NM                                                 | --      | NM                                                | --      | NM                                       | --      | NM                                       | --      |                                                    |         |
| ENDRIN KETONE                      | 53494-9    |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                               |                                                                             |                             |         |                                                    |         |                                                    |         |                                                    |         |                             |         |                                                    |         |                                                    |         |                                                    |         |                                                   |         |                                          |         |                                          |         |                                                    |         |



TABLE 7-1  
Summary of Soil Analytical Results  
Area E  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Soil Table Footnotes:

- EGLE Part 201 residential and non-residential generic cleanup criteria and screening levels criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Release Date: December 30, 2013. Updated June 2018.

- Only detected analytes are listed - Gray rows indicate requested analyses. If no analytes are listed below a gray row then all analytes of that group were either not analyzed or not detected.

- **Bold** values are concentrations detected above the laboratory reporting limit.

- **Bold/Shaded** cells indicate analyte concentration exceeded applicable criteria. EGLE Part 201 criteria exceeded is indicated by the footnote in [brackets] following the result value and defined below:

- |                                                                                |                                                                                    |
|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| [2] - Groundwater Surface Water Interface Protection Criteria                  | [11] - Nonresidential Drinking Water Protection Criteria                           |
| [3] - Soil Saturation Concentration Screening Levels                           | [12] - Nonresidential Soil Volatilization to Indoor Air Inhalation Criteria (VIAC) |
| [4] - Residential Drinking Water Protection Criteria                           | [13] - Nonresidential Infinite Source Volatile Soil Inhalation Criteria (VSIC)     |
| [5] - Residential Soil Volatilization to Indoor Air Inhalation Criteria (VIAC) | [14] - Nonresidential Finite VSIC for 5 Meter Source Thickness                     |
| [6] - Residential Infinite Source Volatile Soil Inhalation Criteria (VSIC)     | [15] - Nonresidential Finite VSIC for 2 Meter Source Thickness                     |
| [7] - Residential Finite VSIC for 5 Meter Source Thickness                     | [16] - Nonresidential Particulate Soil Inhalation Criteria                         |
| [8] - Residential Finite VSIC for 2 Meter Source Thickness                     | [17] - Nonresidential Direct Contact Criteria                                      |
| [9] - Residential Particulate Soil Inhalation Criteria                         | [18] - Soil Residential MSSL                                                       |
| [10] - Residential Direct Contact Criteria                                     | [19] - Soil Nonresidential MSSL                                                    |

Evaluation based on EGLE Criteria at time of Project completion.

Samples described in this evaluation may actually refer to stamp sands or to other mining waste from the historic mining and reclamation processes conducted in the area.

-- = No Exceedances

NM = Not Measured

ND = Not Detected

bgs = Below ground surface

ft = Feet

in = Inches

mg/kg = Milligrams per kilogram.

PCBs = Polychlorinated biphenyls

VOC = Volatile organic compound

SVOC = Semi-volatile organic compound

MSSL = Media-Specific Volatilization to Indoor Air Interim Action Screening Level

ug/kg = Micrograms per kilogram

% = Percentage

Criteria Footnotes:

ID = Insufficient data to develop criterion.

NA = A criterion or value is not available

NLL = Hazardous substance is not likely to leach under most soil conditions.

(B) = Background, as defined in R 299.1(b), may be substituted if higher than the calculated cleanup criterion. Background levels may be less than criteria for some inorganic compounds.

(BB) = The state drinking water standard for asbestos (fibers greater than 10 micrometers in length) is in units of a million fibers per liter of water (MFL). Soil concentrations of asbestos are determined by polarized light microscop.

(C) = The criterion developed under R 299.20 to R 299.26 exceeds the chemical- specific soil saturation screening level (Csat). The person proposing or implementing response activity shall document whether additional response activity is required to control free-phase liquids or NAPL to protect against risks associated with free-phase liquids by using methods appropriate for the free-phase liquids present. Development of a site-specific Csat or methods presented in R 299.22, R 299.24(5), and R 299.26(8) may be conducted for the relevant exposure pathways.

(D) = Calculated criterion exceeds 100 percent, hence it is reduced to 100 percent or 1.0E+9 parts per billion (ppb).

(DD) = Hazardous substance causes developmental effects. Residential direct contact criteria are protective of both prenatal and postnatal exposure. Nonresidential direct contact criteria are protective for a pregnant adult receptor.

(F) = Criterion is based on adverse impacts to plant life and phytotoxicity.

(G) = Groundwater surface water interface (GSI) criterion depends on the pH or water hardness, or both, of the receiving surface water. The final chronic value (FCV) for the protection of aquatic life shall be calculated based on the pH or hardness of the receiving surface water. Where water hardness exceeds 400 mg Ca/L, use 400 mg CaCO<sub>3</sub>/L for the FCV calculation. The FCV formula provides values in units of ug/L or ppb.

The generic GSI criterion is the lesser of the calculated FCV, the wildlife value (WV), and the surface water human non-drinking water value (HNDV). The soil GSI protection criteria for these hazardous substances are the greater of the 20 times the GSI criterion or the GSI soil-water partition values using the GSI criteria developed with the procedure described in this footnote. A spreadsheet that may be used to calculate GSI and GSI protection criteria for (G)-footnoted hazardous substances is available on the Department of Environment, Great Lakes, and Energy (EGLE) internet web site. A hardness value of 47.5 CaCO<sub>3</sub>/L and pH of 7, derived from the Michigan Department of Environmental Quality Draft Site Inspection Report for Lake Linden Operations dated 3/29/13, was used in the footnote G calculation spreadsheet.

(H) = Valence-specific chromium data (Cr III and Cr VI) shall be compared to the corresponding valence-specific cleanup criteria. If both Cr III and Cr VI are present in groundwater, the total concentration of both cannot exceed the drinking water criterion of 100 ug/L. If analytical data are provided for total chromium only, they shall be compared to the cleanup criteria for Cr VI. Cr III soil cleanup criterion for protection of drinking water can only be used at sites where groundwater is prevented from being used as a public water supply, currently and in the future, through an approved land or resource use restriction.

(I) = Hazardous substance may exhibit the characteristic of ignitability as defined in 40 C.F.R. §261.21 (revised as of July 1, 2001), which is adopted by reference in these rules and is available for inspection at the EGLE, 525 West Allegan Street, Lansing, Michigan. Copies of the regulation may be purchased, at a cost as of the time of adoption of these rules of \$45, from the Superintendent of documents, Government Printing Office, Washington, DC 20401 (stock number 869-044-00155-1), or from the EGLE, Remediation and Redevelopment Division (RRD), 525 West Allegan Street, Lansing, Michigan 48933, at cost.

(J) = Hazardous substance may be present in several isomer forms. Isomer-specific concentrations shall be added together for comparison to criteria.

(M) = Calculated criterion is below the analytical target detection limit, therefore, the criterion defaults to the target detection limit.

(P) = Amenable cyanide methods or method OIA-1677 shall be used to quantify cyanide concentrations for compliance with all groundwater criteria. Total cyanide methods or method OIA-1677 shall be used to quantify cyanide concentrations for compliance with soil criteria. Nonresidential direct contact criteria may not be protective of the potential for release of hydrogen cyanide gas. Additional land or resource use restrictions may be necessary to protect for the acute inhalation concerns associated with hydrogen cyanide gas.

(Q) = Criteria for carcinogenic polycyclic aromatic hydrocarbons were developed using relative potential potencies to benzo(a)pyrene.

(R) = Hazardous substance may exhibit the characteristic of reactivity as defined in 40 C.F.R. §261.23 (revised as of July 1, 2001), which is adopted by reference in these rules and is available for inspection at the EGLE, 525 West Allegan Street, Lansing, Michigan. Copies of the regulation may be purchased, at a cost as of the time of adoption of these rules of \$45, from the Superintendent of Documents, Government Printing Office, Washington, DC 20401 (stock number 869-044-00155-1), or from the EGLE, RRD, 525 West Allegan Street, Lansing, Michigan 48933, at cost.

(T) = Refer to the federal Toxic Substances Control Act (TSCA), 40 C.F.R. §761, Subpart D and 40 C.F.R. §761, Subpart G, to determine the applicability of TSCA cleanup standards. Subpart D and Subpart G of 40 C.F.R. §761 (July 1, 2001) are adopted by reference in these rules and are available for inspection at the EGLE, 525 West Allegan Street, Lansing, Michigan. Copies of the regulations may be purchased, at a cost as of the time of adoption of these rules of \$55, from the Superintendent of Documents, Government Printing Office, Washington, DC 20401, or from the EGLE, RRD, 525 West Allegan Street, Lansing, Michigan 48933, at cost. Alternatives to compliance with the TSCA standards listed below are possible under 40 C.F.R. §761 Subpart D. New releases may be subject to the standards identified in 40 C.F.R. §761, Subpart G. Use Part 201 soil direct contact cleanup criteria in the published table if TSCA standards are not applicable.

(X) = The GSI criterion shown in the generic cleanup criteria tables is not protective for surface water that is used as a drinking water source. (See R 299.49 Footnotes for generic cleanup criteria tables for additional information.)

(Z) = Mercury is typically measured as total mercury. The generic cleanup criteria, however, are based on data for different species of mercury. Specifically, data for elemental mercury, chemical abstract service (CAS) number 7439976, serve as the basis for the soil volatilization to indoor air criteria, groundwater volatilization to indoor air, and soil inhalation criteria. Data for methyl mercury, CAS number 22967926, serve as the basis for the GSI criterion; and data for mercuric chloride, CAS number 7487947, serve as the basis for the drinking water, groundwater contact, soil direct contact, and the groundwater protection criteria. Comparison to criteria shall be based on species-specific analytical data only if sufficient facility characterization has been conducted to rule out the presence of other species of mercury.

MSSL Footnotes:

J = Hazardous substance may be present in several isomer forms. Isomer-specific concentrations must be added together for comparison to screening level.

JT = Hazardous substance may be present in several isomer forms. Screening levels may be used for the individual isomer provided that it is the sole isomer detected; however, when multiple isomers are detected in a medium, the isomer-specific concentrations must be added together and compared to the most restrictive screening level of the detected isomers.

M = The screening level may be below target detection limits (TDL).

Laboratory Footnotes:

J = The result is an estimated quantity.

U = Analyte analyzed for but not detected above the reported sample reporting limit.

UU = Analyte analyzed for but not detected above the reported sample reporting limit and is an estimated quantity.

**TABLE 7-1**  
**Summary of Soil Analytical Results**  
**Area E**  
**Quincy Mining Company Portage Operations Area**  
**Abandoned Mining Wastes - Torch Lake Non-Superfund Site**

|                                                                                                         | Part 201 Generic Cleanup Criteria Evaluated                                        | Exceedance |
|---------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------|
| <b>EGLE Part 201 Generic Cleanup Criteria<br/>(June 2018)</b>                                           | [2] - Groundwater Surface Water Interface Protection Criteria                      | YES        |
|                                                                                                         | [3] - Soil Saturation Concentration Screening Levels                               | NO         |
|                                                                                                         | [4] - Residential Drinking Water Protection Criteria                               | YES        |
|                                                                                                         | [5] - Residential Soil Volatilization to Indoor Air Inhalation Criteria (VIAC)     | NO         |
|                                                                                                         | [6] - Residential Infinite Source Volatile Soil Inhalation Criteria (VSIC)         | NO         |
|                                                                                                         | [7] - Residential Finite VSIC for 5 Meter Source Thickness                         | NO         |
|                                                                                                         | [8] - Residential Finite VSIC for 2 Meter Source Thickness                         | NO         |
|                                                                                                         | [9] - Residential Particulate Soil Inhalation Criteria                             | NO         |
|                                                                                                         | [10] - Residential Direct Contact Criteria                                         | NO         |
|                                                                                                         | [11] - Nonresidential Drinking Water Protection Criteria                           | YES        |
|                                                                                                         | [12] - Nonresidential Soil Volatilization to Indoor Air Inhalation Criteria (VIAC) | NO         |
|                                                                                                         | [13] - Nonresidential Infinite Source Volatile Soil Inhalation Criteria (VSIC)     | NO         |
|                                                                                                         | [14] - Nonresidential Finite VSIC for 5 Meter Source Thickness                     | NO         |
|                                                                                                         | [15] - Nonresidential Finite VSIC for 2 Meter Source Thickness                     | NO         |
|                                                                                                         | [16] - Nonresidential Particulate Soil Inhalation Criteria                         | NO         |
|                                                                                                         | [17] - Nonresidential Direct Contact Criteria                                      | NO         |
| <b>Media-Specific Volatilization to Indoor Air Interim<br/>Action Screening Levels<br/>(March 2021)</b> | [18] - Soil Residential Media-Specific Screening Level (MSSL)                      | YES        |
|                                                                                                         | [19] - Soil Nonresidential MSSL                                                    | YES        |

TABLE 7-2  
Summary of Groundwater Analytical Results  
Area E  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code                      |            | EGLE Part 201 Generic Cleanup Criteria           |                                                     |                                                              |                                                                                                |                                                                                                   |                         | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                                         |                                            |                                               |                                               |                                                             | Area E           |            |                  |         |                  |         |                      |         |
|------------------------------------|------------|--------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------|-----------------------------------------------|-----------------------------------------------|-------------------------------------------------------------|------------------|------------|------------------|---------|------------------|---------|----------------------|---------|
| Station Name                       | CAS Number | [1]<br>Residential<br>Drinking Water<br>Criteria | [2]<br>Nonresidential<br>Drinking Water<br>Criteria | [3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [4]<br>Residential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [5]<br>Nonresidential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [6]<br>Water Solubility | [8]<br>Shallow<br>Groundwater<br>Residential<br>MSSL                        | [9]<br>Shallow<br>Groundwater<br>Nonresidential<br>MSSL | [10]<br>Groundwater<br>Residential<br>MSSL | [11]<br>Groundwater<br>Residential TS<br>MSSL | [12]<br>Groundwater<br>Nonresidential<br>MSSL | [13]<br>Groundwater<br>Nonresidential<br>MSSL <sub>12</sub> | QMCP-GW20        |            | QMCP-GW21        |         | QMCP-GW61        |         |                      |         |
| Field Sample ID                    |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | QMCP-GW 20 5-9ft |            | QMCP-GW 21 4-8ft |         | QMCP-GW 61 5-9ft |         | QMCP-GW 61 5-9ft DUP |         |
| Sample Date                        |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 9/7/2018         |            | 9/7/2018         |         | 9/7/2018         |         | 9/7/2018             |         |
| Sample Interval (bgs)              |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 5 - 9 ft         |            | 4 - 8 ft         |         | 5 - 9 ft         |         | 5 - 9 ft             |         |
|                                    |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | Result           | Exceeds    | Result           | Exceeds | Result           | Exceeds | Result               | Exceeds |
| Inorganics - Metals (ug/l)         |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |                  |            |                  |         |                  |         |                      |         |
| ARSENIC                            | 7440-38-2  | 10 (A)                                           | 10 (A)                                              | 10                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 2.0              | --         | <1.0 U           | --      | <1.0 U           | --      | <1.0 U               | --      |
| BARIUM                             | 7440-39-3  | 2,000 (A,B)                                      | 2,000 (A,B)                                         | 200 (B,G)                                                    | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM               | --         | NM               | --      | NM               | --      | NM                   | --      |
| CADMIUM                            | 7440-43-9  | 5.0 (A,B)                                        | 5.0 (A,B)                                           | 1.3 (B,G,X)                                                  | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 0.3              | --         | <0.2 U           | --      | <0.2 U           | --      | <0.2 U               | --      |
| CALCIUM                            | 7440-70-2  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM               | --         | NM               | --      | NM               | --      | NM                   | --      |
| CHROMIUM                           | 7440-47-3  | 100 (A,B,H)                                      | 100 (A,B,H)                                         | 40 (B,G,H,X)                                                 | NA                                                                                             | NLV                                                                                               | NLV                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 26               | --         | <1.0 U           | --      | 1.3              | --      | 1.8                  | --      |
| COPPER                             | 7440-50-8  | 4.0 (B,E)                                        | 4.0 (B,E)                                           | 14 (B,G)                                                     | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 17,000           | [1,2,3]    | 1,900            | [1,2,3] | 4,200            | [1,2,3] | 4,200                | [1,2,3] |
| LEAD                               | 7439-92-1  | 4.0 (B,L)                                        | 4.0 (B,L)                                           | 14 (B,G,X)                                                   | NVL                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 9.3              | [1,2]      | <1.0 U           | --      | <1.0 U           | --      | <1.0 U               | --      |
| MAGNESIUM                          | 7439-95-4  | 400,000 (B)                                      | 1,100,000 (B)                                       | NA                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM               | --         | NM               | --      | NM               | --      | NM                   | --      |
| MANGANESE                          | 7439-96-5  | 50 (B,E)                                         | 50 (B,E)                                            | 1,000 (B,G,X)                                                | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 1,600            | [1,2,3]    | 360              | [1,2]   | 450              | [1,2]   | 460                  | [1,2]   |
| MERCURY                            | 7439-97-6  | 2.0 (A,B,Z)                                      | 2.0 (A,B,Z)                                         | 0.0013 (B,Z)                                                 | 56 (B,S,Z)                                                                                     | 56 (B,S,Z)                                                                                        | 56 (B,Z)                | 0.088                                                                       | 0.14                                                    | 1.4                                        | 4.3                                           | 4.3                                           | 8.5                                                         | 1.7              | [3,8,9,10] | 0.2              | [3,8,9] | 0.4              | [3,8,9] | 0.3                  | [3,8,9] |
| POTASSIUM                          | 7440-09-7  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM               | --         | NM               | --      | NM               | --      | NM                   | --      |
| SELENIUM                           | 7782-49-2  | 50 (A,B)                                         | 50 (A,B)                                            | 5 (B)                                                        | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM               | --         | NM               | --      | NM               | --      | NM                   | --      |
| SILVER                             | 7440-22-4  | 34 (B)                                           | 98 (B)                                              | 0.2 (B,M)                                                    | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 19               | [3]        | 4                | [3]     | 9                | [3]     | 8.9                  | [3]     |
| SODIUM                             | 7440-23-5  | 230,000 (HH)                                     | 350,000                                             | NA                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM               | --         | NM               | --      | NM               | --      | NM                   | --      |
| STRONTIUM                          | 7440-24-6  | 4,600 (B)                                        | 13,000 (B)                                          | 21,000 (B)                                                   | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM               | --         | NM               | --      | NM               | --      | NM                   | --      |
| ZINC                               | 7440-66-6  | 2,400 (B)                                        | 5,000 (B,E)                                         | 63 (B,G)                                                     | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 94               | [3]        | 5.9              | --      | 95               | [3]     | 99                   | [3]     |
| Organics - PCBs as Aroclors (ug/l) |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |                  |            |                  |         |                  |         |                      |         |
| TOTAL PCBs                         | 1336-36-6  | 0.5 (A,J,T)                                      | 0.5 (A,J,T)                                         | 0.2 (J,M,T)                                                  | 45 (J,S,T)                                                                                     | 45 (J,S,T)                                                                                        | 44.7 (J,T)              | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | ND               | --         | NM               | --      | ND               | --      | ND                   | --      |
| Organics - SVOCs (ug/l)            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |                  |            |                  |         |                  |         |                      |         |
| 2-METHYLNAPHTHALENE (SVOC)         | 91-57-6S   | 260                                              | 750                                                 | 19                                                           | 25,000 (S)                                                                                     | 25,000 (S)                                                                                        | 24,600                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 UJ            | --         | <5.0 U           | --      | <5.0 U           | --      | <5.1 U               | --      |
| ACENAPHTHENE                       | 83-32-9    | 1,300                                            | 3,800                                               | 38                                                           | 4,200 (S)                                                                                      | 4,200 (S)                                                                                         | 4,240                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1 UJ            | --         | <1.0 U           | --      | <1.0 U           | --      | <1.0 U               | --      |
| ACENAPHTHYLENE                     | 208-96-8   | 52                                               | 150                                                 | ID                                                           | 3,900 (S)                                                                                      | 3,900 (S)                                                                                         | 3,930                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1 UJ            | --         | <1.0 U           | --      | <1.0 U           | --      | <1.0 U               | --      |
| ANTHRACENE                         | 120-12-7   | 43 (S)                                           | 43 (S)                                              | ID                                                           | 43 (S)                                                                                         | 43 (S)                                                                                            | 43.4                    | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1.0 U           | --         | <1.0 U           | --      | <1.0 U           | --      | <1.0 U               | --      |
| BENZO(A)ANTHRACENE                 | 56-55-3    | 2.1 (Q)                                          | 8.5 (Q)                                             | ID                                                           | NLV                                                                                            | NLV                                                                                               | 9.4 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1 UJ            | --         | <1.0 U           | --      | <1.0 U           | --      | <1.0 U               | --      |
| BENZO(A)PYRENE                     | 50-32-8    | 5.0 (A,Q)                                        | 5.0 (A,Q)                                           | ID                                                           | NLV                                                                                            | NLV                                                                                               | 1.62 (Q)                | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1 UJ            | --         | <1.0 U           | --      | <1.0 U           | --      | <1.0 U               | --      |
| BENZO(B)FLUORANTHENE               | 205-99-2   | 1.5 (Q,S,AA)                                     | 1.5 (Q,S,AA)                                        | ID                                                           | ID                                                                                             | ID                                                                                                | 1.5 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1 UJ            | --         | <1.0 U           | --      | <1.0 U           | --      | <1.0 U               | --      |
| BENZO(G,H,I)PERYLENE               | 191-24-2   | 1.0 (M)                                          | 1.0 (M)                                             | ID                                                           | NLV                                                                                            | NLV                                                                                               | 0.26                    | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1.0 U           | --         | <1.0 U           | --      | <1.0 U           | --      | <1.0 U               | --      |
| BENZO(K)FLUORANTHENE               | 207-08-9   | 1.0 (M,Q)                                        | 1.0 (M,Q)                                           | NA                                                           | NLV                                                                                            | NLV                                                                                               | 0.8 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1 UJ            | --         | <1.0 U           | --      | <1.0 U           | --      | <1.0 U               | --      |
| CHRYSENE                           | 218-01-9   | 1.6 (Q,S)                                        | 1.6 (Q,S)                                           | ID                                                           | ID                                                                                             | ID                                                                                                | 1.6 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1.0 U           | --         | <1.0 U           | --      | <1.0 U           | --      | <1.0 U               | --      |
| FLUORANTHENE                       | 206-44-0   | 210 (S)                                          | 210 (S)                                             | 1.6                                                          | 210 (S)                                                                                        | 210 (S)                                                                                           | 206                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1.0 U           | --         | <1.0 U           | --      | <1.0 U           | --      | <1.0 U               | --      |
| FLUORENE                           | 86-73-7    | 880                                              | 2,000 (S)                                           | 12                                                           | 2,000 (S)                                                                                      | 2,000 (S)                                                                                         | 1,980                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1 UJ            | --         | <1.0 U           | --      | <1.0 U           | --      | <1.0 U               | --      |
| INDENO(1,2,3-CD)PYRENE             | 193-39-5   | 2.0 (M,Q)                                        | 2.0 (M,Q)                                           | ID                                                           | NLV                                                                                            | NLV                                                                                               | 0.022 (Q)               | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <2.0 U           | --         | <2.0 U           | --      | <2.0 U           | --      | <2.0 U               | --      |
| NAPHTHALENE (SVOC)                 | 91-20-3S   | 520                                              | 1,500                                               | 11                                                           | 31,000 (S)                                                                                     | 31,000 (S)                                                                                        | 31,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1 UJ            | --         | <1.0 U           | --      | <1.0 U           | --      | <1.0 U               | --      |
| PENTACHLOROPHENOL                  | 87-86-5    | 1.0 (A)                                          | 1.0 (A)                                             | 1.8 (G,X)                                                    | NLV                                                                                            | NLV                                                                                               | 1.85E+06                | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM               | --         | NM               | --      | NM               | --      | NM                   | --      |
| PHENANTHRENE                       | 85-01-8    | 52                                               | 150                                                 | 2.0 (M)                                                      | 1,000 (S)                                                                                      | 1,000 (S)                                                                                         | 1,000                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1.0 U           | --         | <1.0 U           | --      | <1.0 U           | --      | <1.0 U               | --      |
| PYRENE                             | 129-00-0   | 140 (S)                                          | 140 (S)                                             | ID                                                           | 140 (S)                                                                                        | 140 (S)                                                                                           | 135                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1.0 U           | --         | <1.0 U           | --      | <1.0 U           | --      | <1.0 U               | --      |

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 7-2  
Summary of Groundwater Analytical Results  
Area E  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code              |            | EGLE Part 201 Generic Cleanup Criteria           |                                                     |                                                              |                                                                                                |                                                                                                   |                         | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                                         |                                            |                                               |                                               |                                                             | Area E           |         |                  |         |                  |         |                      |         |
|----------------------------|------------|--------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------|-----------------------------------------------|-----------------------------------------------|-------------------------------------------------------------|------------------|---------|------------------|---------|------------------|---------|----------------------|---------|
| Station Name               | CAS Number | [1]<br>Residential<br>Drinking Water<br>Criteria | [2]<br>Nonresidential<br>Drinking Water<br>Criteria | [3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [4]<br>Residential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [5]<br>Nonresidential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [6]<br>Water Solubility | [8]<br>Shallow<br>Groundwater<br>Residential<br>MSSL                        | [9]<br>Shallow<br>Groundwater<br>Nonresidential<br>MSSL | [10]<br>Groundwater<br>Residential<br>MSSL | [11]<br>Groundwater<br>Residential TS<br>MSSL | [12]<br>Groundwater<br>Nonresidential<br>MSSL | [13]<br>Groundwater<br>Nonresidential<br>MSSL <sub>12</sub> | QMCP-GW20        |         | QMCP-GW21        |         | QMCP-GW61        |         |                      |         |
| Field Sample ID            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | QMCP-GW 20 5-9ft |         | QMCP-GW 21 4-8ft |         | QMCP-GW 61 5-9ft |         | QMCP-GW 61 5-9ft DUP |         |
| Sample Date                |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 9/7/2018         |         | 9/7/2018         |         | 9/7/2018         |         | 9/7/2018             |         |
| Sample Interval (bgs)      |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 5 - 9 ft         |         | 4 - 8 ft         |         | 5 - 9 ft         |         | 5 - 9 ft             |         |
|                            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | Result           | Exceeds | Result           | Exceeds | Result           | Exceeds | Result               | Exceeds |
| Organics - VOCs (ug/l)     |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |                  |         |                  |         |                  |         |                      |         |
| 1,1,1-TRICHLOROETHANE      | 71-55-6    | 200 (A)                                          | 200 (A)                                             | 89                                                           | 660,000                                                                                        | 1,300,000 (S)                                                                                     | 1,330,000               | 180                                                                         | 500                                                     | 8,600                                      | 8,600                                         | 24,000                                        | 24,000                                                      | <1.0 U           | --      | <1.0 U           | --      | <1.0 U           | --      | <1.0 U               | --      |
| 1,2,3-TRIMETHYLBENZENE     | 526-73-8   | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | 43 (JT)                                                                     | 67 (JT)                                                 | 800 (JT)                                   | 2,400 (JT)                                    | 2,300 (JT)                                    | 4,700 (JT)                                                  | <1.0 U           | --      | <1.0 U           | --      | <1.0 U           | --      | <1.0 U               | --      |
| 1,2,4-TRIMETHYLBENZENE     | 95-63-6    | 63 (E,I)                                         | 63 (E,I)                                            | 17 (I)                                                       | 56,000 (I,S)                                                                                   | 56,000 (I,S)                                                                                      | 55,890 (I)              | 25 (JT)                                                                     | 44 (JT)                                                 | 440 (JT)                                   | 1,300 (JT)                                    | 1,300 (JT)                                    | 2,600 (JT)                                                  | <1.0 U           | --      | <1.0 U           | --      | <1.0 U           | --      | <1.0 U               | --      |
| 1,3,5-TRIMETHYLBENZENE     | 108-67-8   | 72 (E,I)                                         | 72 (E,I)                                            | 45 (I)                                                       | 61,000 (I,S)                                                                                   | 61,000 (I,S)                                                                                      | 61,150 (I)              | 18 (JT)                                                                     | 30 (JT)                                                 | 310 (JT)                                   | 940 (JT)                                      | 920 (JT)                                      | 1,800 (JT)                                                  | <1.0 U           | --      | <1.0 U           | --      | <1.0 U           | --      | <1.0 U               | --      |
| 2-METHYLNAPHTHALENE (VOC)  | 91-57-6V   | 260                                              | 750                                                 | 19                                                           | 25,000 (S)                                                                                     | 25,000 (S)                                                                                        | 24,600                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5.0 U           | --      | <5.0 U           | --      | <5.0 U           | --      | <5.0 U               | --      |
| ACETONE                    | 67-64-1    | 730 (I)                                          | 2100 (I)                                            | 1700 (I)                                                     | 1.0E+9 (D,I,S)                                                                                 | 1.0E+9 (D,I,S)                                                                                    | 1.0E+9 (I)              | 50,000                                                                      | 62,000                                                  | 1.20E+07                                   | 1.20E+07                                      | 2.50E+07                                      | 2.50E+07                                                    | <20 U            | --      | <20 U            | --      | <20 U            | --      | <20 U                | --      |
| BENZENE                    | 71-43-2    | 5.0 (A,I)                                        | 5.0 (A,I)                                           | 12 (I,X)                                                     | 5,600 (I)                                                                                      | 35,000 (I)                                                                                        | 1,750,000 (I)           | 1                                                                           | 2.7                                                     | 14                                         | 82                                            | 66                                            | 130                                                         | <1.0 U           | --      | <1.0 U           | --      | <1.0 U           | --      | <1.0 U               | --      |
| CYCLOHEXANE                | 110-82-7   | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5.0 U           | --      | <5.0 U           | --      | <5.0 U           | --      | <5.0 U               | --      |
| ETHYLBENZENE               | 100-41-4   | 74 (E,I)                                         | 74 (E,I)                                            | 18 (I)                                                       | 110,000 (I)                                                                                    | 170,000 (I,S)                                                                                     | 169,000 (I)             | 2.8                                                                         | 7.6                                                     | 45                                         | 450                                           | 210                                           | 420                                                         | <1.0 U           | --      | <1.0 U           | --      | <1.0 U           | --      | <1.0 U               | --      |
| HEXANE                     | 110-54-3   | 3,000                                            | 8,600                                               | NA                                                           | 12,000 (S)                                                                                     | 12,000 (S)                                                                                        | 12,000                  | 29                                                                          | 85                                                      | 29 (GW)                                    | 33                                            | 85 (GW)                                       | 170 (GW)                                                    | <1.0 U           | --      | <1.0 U           | --      | <1.0 U           | --      | <1.0 U               | --      |
| ISOPROPYLBENZENE           | 98-82-8    | 800                                              | 2,300                                               | 28                                                           | 56,000 (S)                                                                                     | 56,000 (S)                                                                                        | 56,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1.0 U           | --      | <1.0 U           | --      | <1.0 U           | --      | <1.0 U               | --      |
| M,P-XYLENE                 | 1330-20-7  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <2.0 U           | --      | <2.0 U           | --      | <2.0 U           | --      | <2.0 U               | --      |
| NAPHTHALENE (VOC)          | 91-20-3V   | 520                                              | 1,500                                               | 11                                                           | 31,000 (S)                                                                                     | 31,000 (S)                                                                                        | 31,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5.0 U           | --      | <5.0 U           | --      | <5.0 U           | --      | <5.0 U               | --      |
| N-PROPYLBENZENE            | 103-65-1   | 80 (I)                                           | 230 (I)                                             | ID                                                           | ID                                                                                             | ID                                                                                                | NA                      | 43                                                                          | 83                                                      | 4100                                       | 12000                                         | 8100                                          | 8100                                                        | <1.0 U           | --      | <1.0 U           | --      | <1.0 U           | --      | <1.0 U               | --      |
| O-XYLENE                   | 95-47-6    | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1.0 U           | --      | <1.0 U           | --      | <1.0 U           | --      | <1.0 U               | --      |
| TETRACHLOROETHYLENE        | 127-18-4   | 5.0 (A)                                          | 5.0 (A)                                             | 11 (X)                                                       | 25,000                                                                                         | 170,000                                                                                           | 200,000                 | 1.5                                                                         | 3                                                       | 96                                         | 96                                            | 190                                           | 380                                                         | <1.0 U           | --      | <1.0 U           | --      | <1.0 U           | --      | <1.0 U               | --      |
| TOLUENE                    | 108-88-3   | 790 (E,I)                                        | 790 (E,I)                                           | 270 (I)                                                      | 530,000 (I,S)                                                                                  | 530,000 (I,S)                                                                                     | 526,000 (I)             | 300                                                                         | 570                                                     | 23,000                                     | 33,000                                        | 66,000                                        | 66,000                                                      | <1.0 U           | --      | <1.0 U           | --      | <1.0 U           | --      | <1.0 U               | --      |
| TRICHLOROETHYLENE          | 79-01-6    | 5.0 (A)                                          | 5.0 (A)                                             | 29 (X)                                                       | 2,200                                                                                          | 4,900                                                                                             | 1,100,000               | 0.073 (M)                                                                   | 0.14 (M)                                                | 6.1                                        | 18                                            | 12                                            | 24                                                          | <1.0 U           | --      | <1.0 U           | --      | <1.0 U           | --      | <1.0 U               | --      |
| XYLENE - TOTAL             | 1330-20-7  | 280 (E,I)                                        | 280 (E,I)                                           | 49 (I)                                                       | 190,000 (I,S)                                                                                  | 190,000 (I,S)                                                                                     | 186,000 (I)             | 75 (J)                                                                      | 120 (J)                                                 | 1,200 (J)                                  | 3,600 (J)                                     | 3,500 (J)                                     | 7,100 (J)                                                   | <3.0 U           | --      | ND               | --      | ND               | --      | ND                   | --      |
| Other                      |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |                  |         |                  |         |                  |         |                      |         |
| CHLORIDE (mg/l)            | 16887-00-6 | 250,000 (E)                                      | 250,000 (E)                                         | 50 (FF)                                                      | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM               | --      | NM               | --      | NM               | --      | NM                   | --      |
| NITROGEN (mg/l)            | 7727-37-9  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM               | --      | NM               | --      | NM               | --      | NM                   | --      |
| HYDROCARBONS, TOTAL (mg/l) | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM               | --      | NM               | --      | NM               | --      | NM                   | --      |
| Water Quality Parameters   |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |                  |         |                  |         |                  |         |                      |         |
| TEMPERATURE (°C)           | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 15.2             | --      | 17.7             | --      | 14.6             | --      | NM                   | --      |
| CONDUCTIVITY (mS/cm)       | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 0.280            | --      | 0.700            | --      | 0.900            | --      | NM                   | --      |
| DISSOLVED OXYGEN (%)       | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 2.9              | --      | 2.3              | --      | 21.7             | --      | NM                   | --      |
| pH                         | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 7.19             | --      | 7.21             | --      | 7.08             | --      | NM                   | --      |
| TURBIDITY (nTu)            | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM               | --      | NM               | --      | NM               | --      | NM                   | --      |

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 7-2  
Summary of Groundwater Analytical Results  
Area E  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Groundwater Table Footnotes:

- EGLE Part 201 residential and non-residential generic cleanup criteria and screening levels criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Release Date: December 30, 2013. Updated December 21, 2020.

- Only detected analytes are listed - Gray rows indicate requested analyses. If no analytes are listed below a gray row then all analytes of that group were either not analyzed or not detected.

- Bold values are concentrations detected above the laboratory reporting limit.

- Bold/Shaded cells indicate analyte concentration exceeded applicable criteria. EGLE Part 201 criteria exceeded is indicated by the footnote in [brackets] following the result value and defined below:

|                                                                                   |                                                    |
|-----------------------------------------------------------------------------------|----------------------------------------------------|
| [1] - Residential Drinking Water Criteria                                         | [8] Shallow Groundwater Residential MSSL           |
| [2] - Nonresidential Drinking Water Criteria                                      | [9] Shallow Groundwater Nonresidential MSSL        |
| [3] - Groundwater Surface Water Interface Criteria                                | [10] Groundwater Residential MSSL                  |
| [4] - Water Solubility                                                            | [11] Groundwater Residential TS MSSL               |
| [5] - Residential Groundwater Volatilization to Indoor Air Inhalation Criteria    | [12] Groundwater Nonresidential MSSL               |
| [6] - Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria | [13] Groundwater Nonresidential MSSL <sub>12</sub> |
| [7] - Flammability and Explosivity Screening Level                                | [14] Groundwater Nonresidential TS MSSL            |

Evaluation based on EGLE Criteria at time of Project completion.

|                                       |                                                                                                     |
|---------------------------------------|-----------------------------------------------------------------------------------------------------|
| -- = No Exceedances                   | mg/l = Milligrams per liter                                                                         |
| ND = Not Detected                     | °C = Degrees Celsius                                                                                |
| NM = Not Measured                     | mS/cm = MilliSiemens per centimeter                                                                 |
| bgs = Below ground surface            | % = Percentage                                                                                      |
| ft = Feet                             | nTu = Nephelometric Turbidity Unit                                                                  |
| PCBs = Polychlorinated biphenyls      | pH = pH acid-base scale                                                                             |
| SVOC = Semi-volatile organic compound | MSSL = Media-Specific Volatilization to Indoor Air Interim Action Screening Level                   |
| VOC = Volatile organic compound       | TS MSSL = Time Sensitive Media-Specific Volatilization to Indoor Air Interim Action Screening Level |

ug/l = Micrograms per liter

Groundwater Table Footnotes:

ID = Insufficient data to develop criterion.

NA = A criterion or value is not available

NLV = Hazardous substance is not likely to volatilize under most conditions.

(A) = Criterion is the state of Michigan drinking water standard established pursuant to Section 5 of 1976 PA 399, MCL 325.1005.

(AA) = Use 10,000 ug/l where groundwater enters a structure through the use of a water well, sump or other device. Use 28,000 ug/l for all other uses.

(B) = Background, as defined in R 299.1(b), may be substituted if higher than the calculated cleanup criterion. Background levels may be less than criteria for some inorganic compounds.

(D) = Calculated criterion exceeds 100 percent, hence it is reduced to 100 percent or 1.0E+9 parts per billion (ppb).

(E) = Criterion is the aesthetic drinking water value, as required by Section 20120a(5) of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA). A notice of aesthetic impact may be employed as an institutional control mechanism if groundwater concentrations exceed the aesthetic drinking water criterion, but do not exceed the applicable health-based drinking water value provided in a table available on the Department of Environment, Great Lakes, and Energy (EGLE) internet web site. (See R 299.49 Footnotes for generic cleanup criteria tables for additional information)

(FF) = The chloride GSI criterion shall be 125 mg/l when the discharge is to surface waters of the state designated as public water supply sources or 50 mg/l when the discharge is to the Great Lakes or connecting waters. Chloride GSI criteria shall not apply for surface waters of the state that are not designated as a public water supply source, however, the total dissolved solids criterion is applicable.

(G) = Groundwater surface water interface (GSI) criterion depends on the pH or water hardness, or both, of the receiving surface water. The final chronic value (FCV) for the protection of aquatic life shall be calculated based on the pH or hardness of the receiving surface water. Where water hardness exceeds 400 mg CaCO<sub>3</sub>/L, use 400 mg CaCO<sub>3</sub>/L for the FCV calculation. The FCV formula provides values in units of ug/L or ppb. The generic GSI criterion is the lesser of the calculated FCV, the wildlife value (WV), and the surface water human non-drinking water value (HNDV). The soil GSI protection criteria for these hazardous substances are the greater of the 20 times the GSI criterion or the GSI soil-water partition values using the GSI criteria developed with the procedure described in this footnote. A spreadsheet that may be used to calculate GSI and GSI protection criteria for (G)-footnoted hazardous substances is available on the Department of Environment, Great Lakes, and Energy (EGLE) internet web site. A hardness value of 47.5 CaCO<sub>3</sub>/L and pH of 7, derived from the Michigan Department of Environmental Quality Draft Site Inspection Report for Lake Linden Operations dated 3/29/13, was used in the footnote G calculation spreadsheet.

(H) = Valence-specific chromium data (Cr III and Cr VI) shall be compared to the corresponding valence-specific cleanup criteria. If both Cr III and Cr VI are present in groundwater, the total concentration of both cannot exceed the drinking water criterion of 100 ug/L. If analytical data are provided for total chromium only, they shall be compared to the cleanup criteria for Cr VI. Cr III soil cleanup criterion for protection of drinking water can only be used at sites where groundwater is prevented from being used as a public water supply, currently and in the future, through an approved land or resource use restriction.

(HH) = The residential criterion for sodium is 230,000 ug/l in accordance with the Sodium Advisory Council recommendation and revised Groundwater Discharge Standards.

(I) = Hazardous substance may exhibit the characteristic of ignitability as defined in 40 C.F.R. §261.21 (revised as of July 1, 2001), which is adopted by reference in these rules and is available for inspection at EGLE, 525 West Allegan Street, Lansing, Michigan. Copies of the regulation may be purchased, at a cost as of the time of adoption of these rules of \$45, from the Superintendent of documents, Government Printing Office, Washington, DC 20401 (stock number 869-044-00155-1), or from the EGLE, Remediation and Redevelopment Division (RRD), 525 West Allegan Street, Lansing, Michigan 48933, at cost.

(J) = Hazardous substance may be present in several isomer forms. Isomer-specific concentrations shall be added together for comparison to criteria.

(L) = Criteria for lead are derived using a biologically based model, as allowed for under Section 20120a(9) of the NREPA, and are not calculated using the algorithms and assumptions specified in pathway-specific rules. The generic residential drinking water criterion of 4 ug/L is linked to the generic residential soil direct contact criterion of 400 mg/kg. A higher concentration in the drinking water, up to the state action level of 15 ug/L, may be allowed as a site-specific remedy and still allow for drinking water use, under Section 20120a(2) and 20120b of the NREPA if soil concentrations are appropriately lower than 400 mg/kg. If a site-specific criterion is approved based on this subdivision, a notice shall be filed on the deed for all property where the groundwater concentrations will exceed 4 ug/L to provide notice of the potential for unacceptable risk if soil or groundwater concentrations increase.

Acceptable combinations of site-specific soil and drinking water concentrations are presented in a table available on the Department of Environment, Great Lakes, and Energy (EGLE) internet web site (See R 299.49 Footnotes for generic cleanup criteria tables for additional information).

(M) = Calculated criterion is below the analytical target detection limit, therefore, the criterion defaults to the target detection limit.

(Q) = Criteria for carcinogenic polycyclic aromatic hydrocarbons were developed using relative potential potencies to benzo(a)pyrene.

(S) = Criterion defaults to the hazardous substance-specific water solubility limit.

(T) = Refer to the federal Toxic Substances Control Act (TSCA), 40 C.F.R. §761, Subpart D and 40 C.F.R. §761, Subpart G, to determine the applicability of TSCA cleanup standards. Subpart D and Subpart G of 40 C.F.R. §761 (July 1, 2001) are adopted by reference in these rules and are available for inspection at the EGLE, 525 West Allegan Street, Lansing, Michigan. Copies of the regulations may be purchased, at a cost as of the time of adoption of these rules of \$55, from the Superintendent of Documents, Government Printing Office, Washington, DC 20401, or from the EGLE, RRD, 525 West Allegan Street, Lansing, Michigan 48933, at cost. Alternatives to compliance with the TSCA standards listed below are possible under 40 C.F.R. §761 Subpart D. New releases may be subject to the standards identified in 40 C.F.R. §761, Subpart G. Use Part 201 soil direct contact cleanup criteria in the published table if TSCA standards are not applicable.

(X) = The GSI criterion shown in the generic cleanup criteria tables is not protective for surface water that is used as a drinking water source. (See R 299.49 Footnotes for generic cleanup criteria tables for additional information.)

(Z) = Mercury is typically measured as total mercury. The generic cleanup criteria, however, are based on data for different species of mercury. Specifically, data for elemental mercury, chemical abstract service (CAS) number 7439976, serve as the basis for the soil volatilization to indoor air criteria, groundwater volatilization to indoor air, and soil inhalation criteria. Data for methyl mercury, CAS number 22967926, serve as the basis for the GSI criterion; and data for mercuric chloride, CAS number 7487947, serve as the basis for the drinking water, groundwater contact, soil direct contact, and the groundwater protection criteria. Comparison to criteria shall be based on species-specific analytical data only if sufficient facility characterization has been conducted to rule out the presence of other species of mercury.

MSSL Footnotes:

GW = The calculated value for a hazardous substance based upon shallow groundwater is considered protective when it is greater than the calculated value for groundwater.

J = Hazardous substance may be present in several isomer forms. Isomer-specific concentrations must be added together for comparison to screening level.

JT = Hazardous substance may be present in several isomer forms. Screening levels may be used for the individual isomer provided that it is the sole isomer detected; however, when multiple isomers are detected in a medium, the isomer-specific concentrations must be added together and compared to the most restrictive screening level of the detected isomers.

Laboratory Footnotes:

U = Analyte analyzed for but not detected above the reported sample reporting limit.

**TABLE 7-2**  
**Summary of Groundwater Analytical Results**  
**Area E**  
**Quincy Mining Company Portage Operations Area**  
**Abandoned Mining Wastes - Torch Lake Non-Superfund Site**

|                                                                                                         | Part 201 Generic Cleanup Criteria Evaluated                                          | Exceedance |
|---------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|------------|
| <b>EGLE Part 201 Generic Cleanup Criteria<br/>(December 2020)</b>                                       | [1] Residential Drinking Water Criteria                                              | YES        |
|                                                                                                         | [2] Nonresidential Drinking Water Criteria                                           | YES        |
|                                                                                                         | [3] Groundwater Surface Water Interface Criteria                                     | YES        |
|                                                                                                         | [4] Residential Groundwater Volatilization to Indoor Air Inhalation Criteria         | NO         |
|                                                                                                         | [5] Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria      | NO         |
|                                                                                                         | [6] Water Solubility                                                                 | NO         |
|                                                                                                         | [7] Flammability and Explosivity Screening                                           | NO         |
| <b>Media-Specific Volatilization to Indoor Air<br/>Interim Action Screening Levels<br/>(March 2021)</b> | [8] Shallow Groundwater Residential Media-Specific Screening Level (MSSL)            | YES        |
|                                                                                                         | [9] Shallow Groundwater Nonresidential MSSL                                          | YES        |
|                                                                                                         | [10] Groundwater Residential MSSL                                                    | YES        |
|                                                                                                         | [11] Groundwater Residential Time Sensitive Media-Specific Screening Level (TS MSSL) | NO         |
|                                                                                                         | [12] Groundwater Nonresidential MSSL                                                 | NO         |
|                                                                                                         | [13] Groundwater Nonresidential MSSL <sub>12</sub>                                   | NO         |
|                                                                                                         | [14] Groundwater Nonresidential TS MSSL <sub>12</sub>                                | NO         |

## 8. DETAILED FINDINGS – AREA F

This Section summarizes the SI results and the subsequent findings for Area F within QMCP derived from implementation of the SAP. The narrative follows the systematic investigative approach outlined in **Section 3**, while providing specific details about the potential human health and ecological risks associated with the historical mining operations in this subarea of QMCP.

### 8.1 SITE INSPECTION AND INVESTIGATION RESULTS

The implementation of the site inspection and investigation activities provided critical lines of evidence that link the historical documentation and the current environmental conditions in and around the Portage Canal. The following subsections present the findings of the inspection and investigation activities and provide correlation of mining era operations and their potential impacts on the nearshore and offshore environment of the Portage Canal.

#### 8.1.1 Site Inspection

The site inspection at each subarea included the inventory and locating of historical structures and similar surficial artifacts associated with the former industrial operations in the area. Each subarea was also inspected for potential physical and health hazards that were documented, photographed, and located with a GPS unit. The inventoried hazards were then qualitatively assessed for potential human health and environmental risks to determine if analytical sampling was warranted during the targeted inspection phase of the work.

On September 13, 2018, MSG field team personnel performed reconnaissance activities at Area F. In the cases where access was not requested based on historic operational and investigative findings, property conditions were evaluated from a neighboring property or public right of way where access was permitted. Access to Area F was not requested based on historic operational and investigative findings.

Therefore, the property parcel known as Area F totaling approximately 12 acres was visually inspected and observations were recorded from the MDNR trail property. The qualitative assessment of the reconnaissance findings in Area F did not warrant the performance of targeted inspection activities. The following provides a summary of the findings associated with the reconnaissance activities. A copy of the reconnaissance log is provided in **Appendix C, Site Inspections – Reconnaissance Logs, Targeted Inspections & Physical Hazards Inventory**.

##### 8.1.1.1 Reconnaissance

The reconnaissance activities identified a household thermostat and a pile of soil that had an oily odor along the MDNR trail property. Potentially abandoned containers or other environmental concerns were not observed during the review of Area F. The reconnaissance findings did not warrant the performance of targeted inspection activities other than the soil pile was sampled during the SI.

#### 8.1.2 Site Investigation

The SI in the QMCP was developed based on a variety of data and information as outlined in **Section 3**. In addition to the historical accounts and documentation, current land use and potential exposure pathways were also taken into consideration when selecting the sampling locations specific to Area F. The following subsections present the outcomes of investigative activities completed in Area F by summarizing the laboratory analytical results and characterizing their impacts on the environmental media in which they were detected.



### 8.1.2.1 Terrestrial Investigation

Intrusive investigation activities in Area F were generally guided by the findings of historical research and field observations. From a historical standpoint, the area was the location of a Manufactured Gas Plant, Ward Brass Furnace, Standard Oil Company, and a Filling Station and Bulk Oil Station. Environmental concerns in the area south of the MDNR trail property (former Manufactured Gas Plant) have previously been addressed and were not further investigated as part of the QMCP. Environmental concerns at the former Filling Station and Bulk Oil Station in the northwest corner of Area F were addressed separate from the QMCP and will be discussed in a separate SI report.

Inorganic COCs in the study area to the south of the MDNR trail property were generally understood, particularly in areas where previous investigations and remedial actions had been completed. However, only limited data related to the COCs north of the MDNR trail property was available. The following subsections present a summary of the field observations and analytical results derived from the terrestrial sampling activities along the MDNR trail property.

#### 8.1.2.1.1 Field Observations – Soil and Groundwater

One boring within the MDNR trail property was advanced by GSS to 5 ft bgs. The boring location is depicted on **Figure 8-1, Soil Analytical Results (Area F)**. Soil observations documented on field logs indicate that the subsurface on the MDNR trail property is generally comprised of medium to coarse brown sand.

During groundwater sampling, a temporary well point was established from 5 ft bgs to the boring terminus at 9 ft bgs. Saturated soil conditions were encountered at a depth of 5 ft bgs. Groundwater quality parameters, including temperature, conductivity, DO, and pH, measured at the time of sample collection were generally considered normal.

#### 8.1.2.1.2 Soil Sampling Results

Terrestrial soil investigation activities were completed at Area F on September 7, 2018. Additional surface soil samples were collected on September 28, 2018 (SS51) and September 24, 2020 (SS310 and SS311). During the mobilizations a total of five soil samples were collected from four (4) sampling locations. Soil sampling locations are depicted on **Figure 8-1, Soil Analytical Results (Area F)**. Investigative methodologies and soil sampling techniques were conducted using the procedures outlined in **Section 3**.

Soil sampling included four shallow soil sampling intervals, generally from 0 to 3 inches or 0 to 6 inches (in.) in depth. The balance of the subsurface soil samples ranged from 0.5 ft to 5 ft in depth. The samples were analyzed for the parameters identified on **Table 3-1, Sampling and Analysis Summary** of this SI Report. The selection of analytical parameters was generally based upon potential environmental impacts associated with mining era operations in the vicinity of the sampling location or field observations.

The shallow and subsurface soil analytical results for Area F contained several COCs at concentrations at or above applicable regulatory criteria and MSSLs. Additionally, historic soil analytical results for surface and subsurface samples indicated the presence of COCs at concentrations above applicable regulatory criteria and MSSLs.

A detailed summary of soil analytical results for Area F is provided in **Table 8-1, Summary of Soil Analytical Results (Area F)**. Soil boring logs are included in **Appendix E, Boring Logs** of this SI Report.

#### 8.1.2.1.3 Groundwater Sampling Results

During the advancement of soil borings at Area F, one temporary groundwater sampling location was established to characterize groundwater in the area. The temporary monitoring point was installed and sampled using the methodologies presented in **Section 3**. The screened interval in the groundwater sampling location was established at

5 ft to 9 ft bgs One groundwater sample was collected. The temporary groundwater sampling location is depicted on **Figure 8-2, Groundwater Analytical Results (Area F)**.

The collected groundwater sample was analyzed for the parameters identified on **Table 3-1, Sampling and Analysis Summary** of this SI Report. The selection of analytical parameters was generally based upon potential environmental impacts associated with mining era operations in the vicinity of the sampling location or field observations. The only COCs detected at concentrations above applicable regulatory criteria and MSSs were metals, which were not evaluated further as discussed in **Section 4.2.5**.

A detailed summary of groundwater analytical results collected from Area F are provided in **Table 8-2, Summary of Groundwater Analytical Results (Area F)**. Groundwater analytical results are depicted on **Figure 8-2, Groundwater Analytical Results (Area F)**. Soil boring logs are included in **Appendix E, Boring Logs** of this SI Report.

## 8.2 NATURE AND EXTENT OF CONTAMINATION

Utilizing the established regulatory criteria presented in **Section 4** for various land use categories and exposure pathways, the laboratory analytical results summarized in the preceding section for Area F were reviewed and compared to EGLE Cleanup Criteria Requirements for Response Activity as applicable for the sampled environmental media.

### 8.2.1 Comprehensive Exposure Assessment

The comparison was completed to determine which ecological and human exposure pathways, risks, and conditions are relevant at Area F. Although not inclusive of relevant pathways where regulatory criteria were not exceeded, the following exposure pathways were determined to be relevant in Area F:

- Risks posed by hazardous substances in soil and the potential for the substances to leach to groundwater that could vent to surface water.
- Risks posed by hazardous substances in soil and the potential for direct contact with these soils in both residential and nonresidential settings.
- Risks posed by hazardous substances in soil and the potential for the substances to leach to groundwater that could be used as a drinking water source in both residential and nonresidential settings.
- Risks posed by hazardous substances in groundwater and the potential for that groundwater to be used as a drinking water source in both residential and nonresidential settings.
- Risks posed by hazardous substances in groundwater and the potential for that groundwater to vent to surface water.

As discussed in **Section 4.2.5**, the EGLE drinking water and groundwater/surface water pathway criteria exceedances for metals were excluded from the soil and groundwater evaluation. The rationale for this exclusion is twofold:

- The Project investigation and anticipated response actions are being undertaken pursuant to Part 201 of NREPA, being PA 451 of 1994, as amended. The concentrations of metals in excess of the EGLE drinking water and groundwater/surface water pathway criteria are ubiquitous in the study area and are predominantly the result of the presence of stamp sands. Stamp sands are not defined as a hazardous substance nor are subject to regulation under Part 201 unless the property otherwise contains hazardous substances in excess of concentrations that satisfy the cleanup criteria for unrestricted residential use; and,

- The study area is part of OU 2 for which the EPA ROD remedy called for No Action. The EPA's ROD OU 2 includes groundwater, surface water, submerged tailings and sediments in Torch Lake, Portage Lake, the Portage Canal, and other area water bodies. Note that EPA's No Action determination relies on the following to mitigate the effects of stamp sand to the extent practicable:
  - The reduction of stamp sand loading to surface water bodies expected as a result of the remedial action taken at OU 1 and OU 3.
  - Ongoing natural sedimentation and detoxification.
  - Institutional programs and practices controlling potential future exposure to site-affected drinking water which were intended to be administered at the county and state level.
  - The long-term monitoring and the five-year review process monitoring requirements of the remedy selected for OU 1 and OU 3 under the 1992 ROD.

Note that metals criteria for other relevant pathways, and cyanide and organic contaminants for all pathways were included in the evaluation.

Furthermore, as discussed in **Section 4.2.5**, EGLE's MSSLS were not included in the exposure pathway assessment due to unknown anticipated future land use and conditions. The MSSLS were considered for screening and delineation purposes only.

#### *8.2.1.1 Soil Exposure Pathway Assessment*

Soil analytical results from Area F identified COC concentrations in soil that were at or above concentrations that trigger a "Facility" designation as defined in Section 20101(1)(s) of the NREPA. The following tables provide an aggregate summary of the soil sample locations with respect to the total number of samples and how they compare to the applicable EGLE Cleanup Criteria for Response Activity under both Residential and Nonresidential exposure scenarios. The tables are based solely on the total number of samples, inclusive of historical samples, collected from Area F. They list only the number of samples for a specific analytical suite that contained one or more exceedance of a given criterion.

| Soil Analytical Result Summary Table                                 | Cleanup Criteria Requirements for Response Activity – Residential** |                    |                    |                                                                                                                                                                                                                                                                                                            |                                                         |                                                       |                                                          |                                          |                                          |                                      |                         |                                                |
|----------------------------------------------------------------------|---------------------------------------------------------------------|--------------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------|------------------------------------------|------------------------------------------|--------------------------------------|-------------------------|------------------------------------------------|
|                                                                      | Analytical Summary                                                  |                    |                    | Groundwater Protection                                                                                                                                                                                                                                                                                     |                                                         | Indoor Air                                            | Ambient Air                                              |                                          |                                          |                                      | Contact                 | Csat                                           |
|                                                                      | Total Number of Samples                                             | Detected Analytes* | Total Exceedances* | Residential Drinking Water Protection Criteria                                                                                                                                                                                                                                                             | Groundwater Surface Water Interface Protection Criteria | Soil Volatilization to Indoor Air Inhalation Criteria | Infinite Source Volatile Soil Inhalation Criteria (VSIC) | Finite VSIC for 5 Meter Source Thickness | Finite VSIC for 2 Meter Source Thickness | Particulate Soil Inhalation Criteria | Direct Contact Criteria | Soil Saturation Concentration Screening Levels |
| Inorganics                                                           | 5                                                                   | 72                 | 3                  | NA*                                                                                                                                                                                                                                                                                                        | NA*                                                     | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 3                       | 0                                              |
| Cyanide                                                              | 2                                                                   | 1                  | 1                  | 1                                                                                                                                                                                                                                                                                                          | 1                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 1                       | 0                                              |
| VOCs                                                                 | 8                                                                   | 69                 | 16                 | 4                                                                                                                                                                                                                                                                                                          | 4                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| SVOCs                                                                | 7                                                                   | 74                 | 14                 | 0                                                                                                                                                                                                                                                                                                          | 3                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 2                       | 0                                              |
| Asbestos                                                             | 0                                                                   | 0                  | 0                  | 0                                                                                                                                                                                                                                                                                                          | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Total PCBs                                                           | 3                                                                   | 0                  | 0                  | 0                                                                                                                                                                                                                                                                                                          | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Pesticides                                                           | 2                                                                   | 7                  | 0                  | 0                                                                                                                                                                                                                                                                                                          | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| COCs exceeding applicable regulatory criteria in one or more samples |                                                                     |                    |                    | ARSENIC, CYANIDE, 2-METHYLNAPHTHALENE (SVOC), BENZO(A)PYRENE, BENZO(B)FLUORANTHENE, DIBENZO(A,H)ANTHRACENE, DIBENZOFURAN, FLUORANTHENE, NAPHTHALENE (SVOC), PHENANTHRENE, 1,2,4-TRIMETHYLBENZENE, 2-METHYLNAPHTHALENE (VOC), BENZENE, ETHYLBENZENE, NAPHTHALENE (VOC), TETRACHLOROETHYLENE, XYLENE - TOTAL |                                                         |                                                       |                                                          |                                          |                                          |                                      |                         |                                                |

NA\* = The EGLE drinking water and groundwater/surface water interface pathway criteria exceedances for metals are excluded from the groundwater evaluation as explained in Section 4.2.5.

\*Denotes total number of specific instances of an analyte being detected or exceeding criteria, can be multiple within one sample location.

\*\*Denotes total number of samples exceeding criteria, cannot be multiple within one sample location.

Total exceedance column does not include MSSLS or non-applicable criteria (DWPC and GSIPC for metals).

| Soil Analytical Result Summary Table                                 | Cleanup Criteria Requirements for Response Activity – Nonresidential** |                    |                    |                                                                                                                                                                                                                                                     |                                                         |                                                       |                                                          |                                          |                                          |                                      |                         |                                                |
|----------------------------------------------------------------------|------------------------------------------------------------------------|--------------------|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------|------------------------------------------|------------------------------------------|--------------------------------------|-------------------------|------------------------------------------------|
|                                                                      | Analytical Summary                                                     |                    |                    | Groundwater Protection                                                                                                                                                                                                                              |                                                         | Indoor Air                                            | Ambient Air                                              |                                          |                                          |                                      | Contact                 | Csat                                           |
|                                                                      | Total Number of Samples                                                | Detected Analytes* | Total Exceedances* | Nonresidential Drinking Water Protection Criteria                                                                                                                                                                                                   | Groundwater Surface Water Interface Protection Criteria | Soil Volatilization to Indoor Air Inhalation Criteria | Infinite Source Volatile Soil Inhalation Criteria (VSIC) | Finite VSIC for 5 Meter Source Thickness | Finite VSIC for 2 Meter Source Thickness | Particulate Soil Inhalation Criteria | Direct Contact Criteria | Soil Saturation Concentration Screening Levels |
| Inorganics                                                           | 5                                                                      | 72                 | 0                  | NA*                                                                                                                                                                                                                                                 | NA*                                                     | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Cyanide                                                              | 2                                                                      | 1                  | 1                  | 1                                                                                                                                                                                                                                                   | 1                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| VOCs                                                                 | 8                                                                      | 69                 | 16                 | 4                                                                                                                                                                                                                                                   | 4                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| SVOCs                                                                | 7                                                                      | 74                 | 12                 | 0                                                                                                                                                                                                                                                   | 3                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 2                       | 0                                              |
| Asbestos                                                             | 0                                                                      | 0                  | 0                  | 0                                                                                                                                                                                                                                                   | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Total PCBs                                                           | 3                                                                      | 0                  | 0                  | 0                                                                                                                                                                                                                                                   | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Pesticides                                                           | 2                                                                      | 7                  | 0                  | 0                                                                                                                                                                                                                                                   | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| COCs exceeding applicable regulatory criteria in one or more samples |                                                                        |                    |                    | CYANIDE, 2-METHYLNAPHTHALENE (SVOC), BENZO(A)PYRENE, DIBENZOFURAN, FLUORANTHENE, NAPHTHALENE (SVOC), PHENANTHRENE, 1,2,4-TRIMETHYLBENZENE, 2-METHYLNAPHTHALENE (VOC), BENZENE, ETHYLBENZENE, NAPHTHALENE (VOC), TETRACHLOROETHYLENE, XYLENE - TOTAL |                                                         |                                                       |                                                          |                                          |                                          |                                      |                         |                                                |

NA\* = The EGLE drinking water and groundwater/surface water interface pathway criteria exceedances for metals are excluded from the groundwater evaluation as explained in Section 4.2.5.

\*Denotes total number of specific instances of an analyte being detected or exceeding criteria, can be multiple within one sample location.

\*\*Denotes total number of samples exceeding criteria, cannot be multiple within one sample location.

Total exceedance column does not include MSSLS or non-applicable criteria (DWPC and GSIPC for metals).

#### 8.2.1.2 Groundwater Exposure Pathway Assessment

Groundwater analytical results from Area F identified COC concentrations in groundwater that were at or above concentrations that trigger a “Facility” designation as defined in Section 20101(1)(s) of the NREPA. Similar to the preceding soil tables, the following table provides a summary of the aforementioned sample locations with respect to the total number of samples and how they compare to the applicable EGLE Cleanup Criteria for Response Activity under both Residential and Nonresidential exposure scenarios.

| Groundwater Analytical Result Summary Table                          | Analytical Summary      |                                    |                    | Cleanup Criteria Requirements for Response Activity – Residential and Nonresidential** |                                        |                                              |                                                                          |                                                                             |                  |                                               |
|----------------------------------------------------------------------|-------------------------|------------------------------------|--------------------|----------------------------------------------------------------------------------------|----------------------------------------|----------------------------------------------|--------------------------------------------------------------------------|-----------------------------------------------------------------------------|------------------|-----------------------------------------------|
|                                                                      | Total Number of Samples | Total Number of Detected Analytes* | Total Exceedances* | Residential Drinking Water Criteria                                                    | Nonresidential Drinking Water Criteria | Groundwater Surface Water Interface Criteria | Residential Groundwater Volatilization to Indoor Air Inhalation Criteria | Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria | Water Solubility | Flammability and Explosivity Screening Levels |
| Inorganics                                                           | 1                       | 8                                  | 0                  | NA*                                                                                    | NA*                                    | NA*                                          | 0                                                                        | 0                                                                           | 0                | 0                                             |
| Cyanide                                                              | 0                       | 0                                  | 0                  | 0                                                                                      | 0                                      | 0                                            | 0                                                                        | 0                                                                           | 0                | 0                                             |
| VOCs                                                                 | 1                       | 0                                  | 0                  | 0                                                                                      | 0                                      | 0                                            | 0                                                                        | 0                                                                           | 0                | 0                                             |
| SVOCs                                                                | 1                       | 0                                  | 0                  | 0                                                                                      | 0                                      | 0                                            | 0                                                                        | 0                                                                           | 0                | 0                                             |
| Total PCBs                                                           | 1                       | 0                                  | 0                  | 0                                                                                      | 0                                      | 0                                            | 0                                                                        | 0                                                                           | 0                | 0                                             |
| Pesticides                                                           | 0                       | 0                                  | 0                  | 0                                                                                      | 0                                      | 0                                            | 0                                                                        | 0                                                                           | 0                | 0                                             |
| COCs exceeding applicable regulatory criteria in one or more samples |                         |                                    |                    | Not applicable                                                                         |                                        |                                              |                                                                          |                                                                             |                  |                                               |

NA\* = The EGLE drinking water and groundwater/surface water interface pathway criteria exceedances for metals are excluded from the groundwater evaluation as explained in Section 4.2.5.

\*Denotes total number of specific instances of an analyte being detected or exceeding criteria, can be multiple within one sample location.

\*\*Denotes total number of samples exceeding criteria, cannot be multiple within one sample location.

Total exceedance column does not include MSSLs or non-applicable criteria (DWC and GSIC for metals).

## 8.2.2 Extent of Contamination

The comparison of analytical results to applicable regulatory criteria indicates that potential human health and ecological risks are present in soil and groundwater in Area F. Recalling the goals and objectives of the SI, the following subsections describe the extent of contamination in environmental media in the study area.

### 8.2.2.1 Soil Extent of Contamination

Soil analytical results for historical and more recent SI soil samples exceeded GSIPC, DWPC, and DCC in residential and nonresidential exposure scenarios in Area F. Soil MSSLs for residential and nonresidential scenarios were also exceeded. All soil samples were collected from along the publically accessible MDNR trail property, with the exception of a historical sample (Mickelson-6) that was collected near the shoreline of the Portage Canal at a private residential property.

The sampling locations were within approximately 400 ft of the shoreline of the Portage Canal with the exception of the historic Mickelson-6 sample which was appears to have been collected along the shoreline. No physical hazards were noted during the reconnaissance of Area F along the MDNR trail property.

Soil sampling during the SI was limited to along the MDNR trail property, which becomes a limiting factor when evaluating potential exposure pathways. In the case of Area F, elevated concentrations of organic and inorganic contaminants potentially include exposure risks related to inhalation and dermal contact pathways, which must be a consideration when evaluating land use, property accessibility, and the extent of contamination in surface and near surface soils that could be encountered through normal use of the property.

The remaining exposure risks are related to the leaching of organic and inorganic contaminants to groundwater and their potential impacts on drinking water (if used as a drinking water source) and surface water. These risks pose a long-term threat to the overall environmental health of the watershed. The limits of organic contaminants exceeding criteria are not defined. The widespread distribution of inorganic COCs throughout the region limit determinations related to the extent of contamination in Area F. Nevertheless, risks posed to groundwater and surface water are relevant and are a factor when evaluating the extent of soil contamination in Area F.

#### 8.2.2.2 *Groundwater Extent of Contamination*

Groundwater analytical results for mercury exceeded shallow groundwater MSSLs for residential and nonresidential exposure scenarios but did not exceed regulatory criteria. Certain metals detected in groundwater exceeded EGLE drinking water and groundwater/surface water interface pathway criteria, but as discussed in **Section 4.2.5**, exceedances of metals for these criteria were excluded from the soil and groundwater evaluation.

No other analyzed constituents were detected above criteria or screening levels within Area F. The groundwater sampling location was established along the MDNR trail property in a zone approximately 300 ft to 400 ft from the shoreline of the Portage Canal at depths of approximately 4 ft to 9 ft bgs.

### 8.3 **CONCLUSIONS AND RECOMMENDATIONS**

The analytical results and interpretation summarized in the preceding subsections document potential human health and ecological risks that are present in Area F. The following subsections provide a synopsis of these findings and a recommended path forward for mitigating these risks in Area F.

#### 8.3.1 **Conclusions**

Environmental impacts in Area F are generally characterized by detections of organic and inorganic contaminants in soil and groundwater. Although specific sources of these contaminants may not be fully understood, historical research related to the operations provided substantive evidence for assessing specific operational areas and selecting target analytes anticipated to be present within the study area.

The results from SI activities summarized above provide analytical data and lines of evidence to conclude that the study area is a "Facility" as defined in Section 20101(1)(s) of the NREPA. The following table provides a summary of the affected environmental media, applicable regulatory criteria, and potential receptors within Area F.



| Area F – Media, Criteria, Potential Receptor Summary                 |                           |                                     |                |                                                                                                                                                                                                                                                                                                            |                                     |                              |                |                        |            |               |              |                                                        |                              |               |
|----------------------------------------------------------------------|---------------------------|-------------------------------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|------------------------------|----------------|------------------------|------------|---------------|--------------|--------------------------------------------------------|------------------------------|---------------|
| Media                                                                | Soil                      |                                     |                | Groundwater                                                                                                                                                                                                                                                                                                |                                     |                              | Air            |                        | Sediment   | Surface Water |              | Building Materials, Asbestos, and Abandoned Containers |                              |               |
| Criteria                                                             | Drinking Water Protection | Groundwater Surface Water Interface | Direct Contact | Drinking Water Protection                                                                                                                                                                                                                                                                                  | Groundwater Surface Water Interface | Flammability and Explosivity | Volatilization | Particulate Inhalation | Ecological | Ecological    | Human Health | Particulate Inhalation                                 | Flammability and Explosivity | Environmental |
| Potential Receptor                                                   |                           |                                     |                |                                                                                                                                                                                                                                                                                                            |                                     |                              |                |                        |            |               |              |                                                        |                              |               |
| Residential Human                                                    | ✓                         | ✓                                   | ✓              |                                                                                                                                                                                                                                                                                                            |                                     |                              |                |                        |            |               |              |                                                        |                              |               |
| Nonresidential Human                                                 | ✓                         | ✓                                   | ✓              |                                                                                                                                                                                                                                                                                                            |                                     |                              |                |                        |            |               |              |                                                        |                              |               |
| Water Column Organism                                                |                           |                                     |                |                                                                                                                                                                                                                                                                                                            |                                     |                              |                |                        |            |               |              |                                                        |                              |               |
| Benthic Organism                                                     |                           |                                     |                |                                                                                                                                                                                                                                                                                                            |                                     |                              |                |                        |            |               |              |                                                        |                              |               |
| COCs exceeding applicable regulatory criteria in one or more samples |                           |                                     |                | ARSENIC, CYANIDE, 2-METHYLNAPHTHALENE (SVOC), BENZO(A)PYRENE, BENZO(B)FLUORANTHENE, DIBENZOFURAN, DIBENZO(A,H)ANTHRACENE, FLUORANTHENE, NAPHTHALENE (SVOC), PHENANTHRENE, 1,2,4-TRIMETHYLBENZENE, 2-METHYLNAPHTHALENE (VOC), BENZENE, ETHYLBENZENE, NAPHTHALENE (VOC), TETRACHLOROETHYLENE, XYLENE – TOTAL |                                     |                              |                |                        |            |               |              |                                                        |                              |               |

In addition to the evaluation of analytical results evaluated from Area F, the following provides a summary of findings derived from the assessment of Area F with respect to the goals and objectives for the Project:

- Terrestrial sources of contamination are present in the form of VOCs, SVOCs, and inorganic COCs (predominantly arsenic and mercury), in the study area. Due the limited availability of historic and current SI analytical data, the extent of contamination in Area F has not been fully investigated, defined, or addressed, particularly north of the MDNR trail property.
- Soil impacts on the MDNR trail property exceeded GSIPC, DWPC, DCC, and MSSSLs for residential and nonresidential scenarios but did not exceed PSIC.

### 8.3.2 Recommendations

The conclusions outlined in the preceding subsection establish that Area F is a Part 201 Facility. Section 20107a of Part 201 of NREPA describes the duties of owners or operators of a Facility, regardless of their liability, including: prevent unacceptable exposures, prevent exacerbation, and take reasonable precautions against the foreseeable actions of third parties. Some exceptions may apply; in any case, owners and operators of contaminated properties should become familiar with Section 20107a and the associated Rules.

## FIGURES

### DETAILED FINDINGS REPORT – AREA F



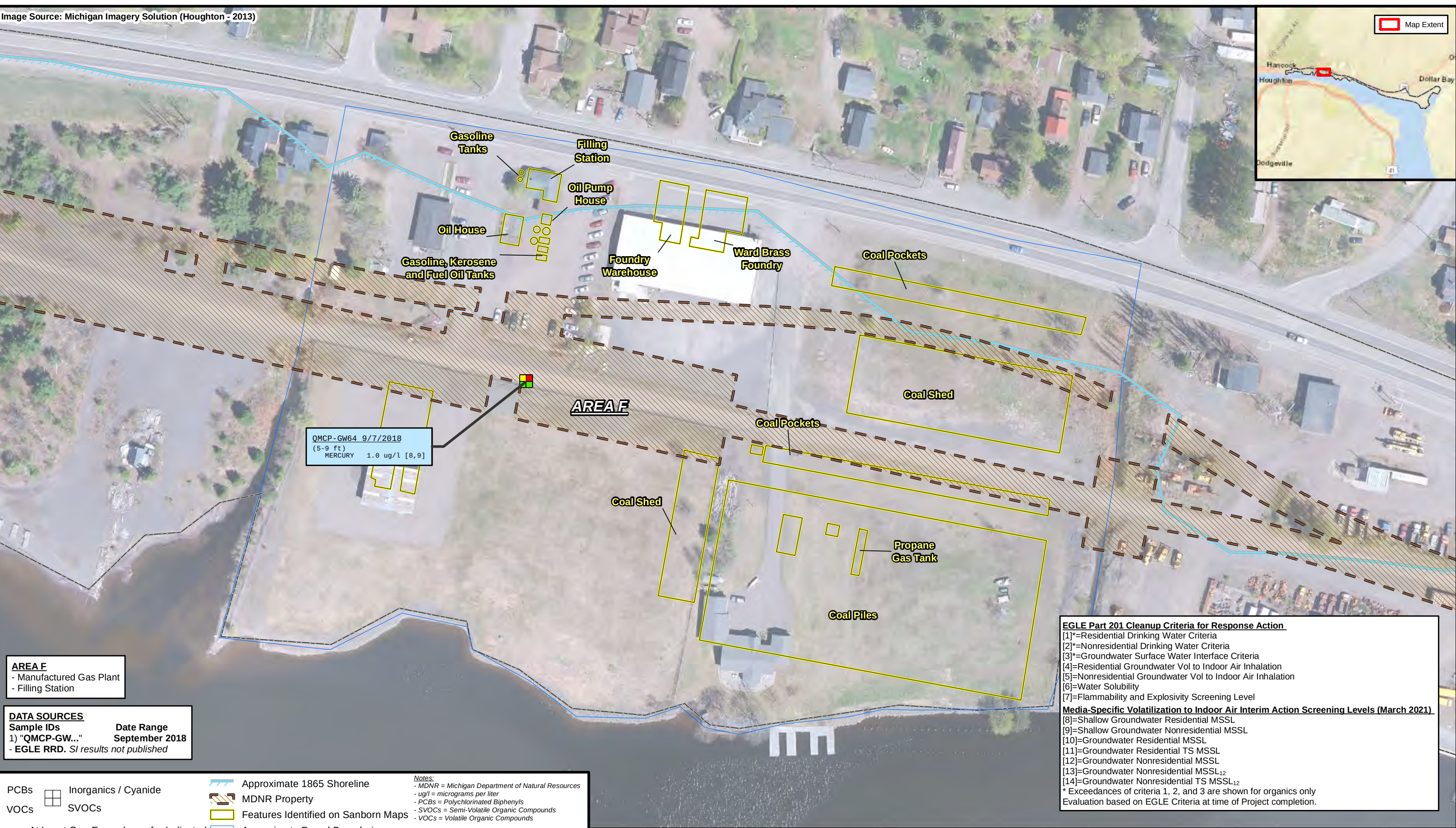






FILE: W:\Projects\Projects-KO\WDE00070\ENR\APPS\GIS\mxd\Plannm\20210304\_QMCP\_SI\_Report\_4ENRXX-QMCP-GW-all\_v20210414.mxd 10:18:55 AM 4/14/2021 AMiller

Image Source: Michigan Imagery Solution (Houghton - 2013)



**AREA F**  
- Manufactured Gas Plant  
- Filling Station

**DATA SOURCES**  
Sample IDs  
1) "QMCP-GW..."  
Date Range  
September 2018  
- EGLE RRD. SI results not published

PCBs Inorganics / Cyanide   
VOCs SVOCs   
 At Least One Exceedance for Indicated Parameter Group  
 No Exceedances for Indicated Parameter Group  
 At Least One Detection of PCBs  
 PCBs Not Detected  
 Indicated Parameter Group Not Analyzed  
 Approximate 1865 Shoreline  
 MDNR Property  
 Features Identified on Sanborn Maps  
 Approximate Parcel Boundaries  
 QMCP Study Area Boundary

**Notes:**  
- MDNR = Michigan Department of Natural Resources  
- ug/l = micrograms per liter  
- PCBs = Polychlorinated Biphenyls  
- SVOCs = Semi-Volatile Organic Compounds  
- VOCs = Volatile Organic Compounds

0 100 Ft  
Coordinate System: MGeoRef(m)

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**EGLE Part 201 Cleanup Criteria for Response Action**  
[1]\*=Residential Drinking Water Criteria  
[2]\*=Nonresidential Drinking Water Criteria  
[3]\*=Groundwater Surface Water Interface Criteria  
[4]=Residential Groundwater Vol to Indoor Air Inhalation  
[5]=Nonresidential Groundwater Vol to Indoor Air Inhalation  
[6]=Water Solubility  
[7]=Flammability and Explosivity Screening Level  
**Media-Specific Volatilization to Indoor Air Interim Action Screening Levels (March 2021)**  
[8]=Shallow Groundwater Residential MSSL  
[9]=Shallow Groundwater Nonresidential MSSL  
[10]=Groundwater Residential MSSL  
[11]=Groundwater Residential TS MSSL  
[12]=Groundwater Nonresidential MSSL  
[13]=Groundwater Nonresidential MSSL<sub>12</sub>  
[14]=Groundwater Nonresidential TS MSSL<sub>12</sub>  
\* Exceedances of criteria 1, 2, and 3 are shown for organics only  
Evaluation based on EGLE Criteria at time of Project completion.

**Figure 8-2**  
Groundwater Analytical Results  
(Area F)  
Quincy Mining Company Portage Operations Area  
Houghton County, Michigan



## TABLES

### DETAILED FINDINGS REPORT – AREA F



TABLE 8-1  
Summary of Soil Analytical Results  
Area F  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code                |            | EGLE Part 201 Generic Cleanup Criteria                                     |                                                                |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                                                                              | Area F      |                                                                                                                                                                             |             |                                                                                                                                                                                                             |         |               |             |                             |          |                                                    |           |                          |         |             |         |             |         |
|------------------------------|------------|----------------------------------------------------------------------------|----------------------------------------------------------------|---------------------------------------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------------------|----------------------------------------------------------------------|------------------------------------------------------|----------------------------------|-----------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------------|-------------|-----------------------------|----------|----------------------------------------------------|-----------|--------------------------|---------|-------------|---------|-------------|---------|
| Station Name                 | CAS Number | [2]<br>Groundwater<br>Surface Water<br>Interface<br>Protection<br>Criteria | [4]<br>Residential<br>Drinking Water<br>Protection<br>Criteria | [5]<br>Residential<br>Soil<br>Volatilization<br>to Indoor Air<br>Inhalation<br>Criteria<br>(VSIC) | [9]<br>Residential<br>Particulate<br>Soil Inhalation<br>Criteria | [10]<br>Residential<br>Direct<br>Contact<br>Criteria | [11]<br>Nonresidential<br>Drinking Water<br>Protection<br>Criteria | [16]<br>Nonresidential<br>Particulate<br>Soil Inhalation<br>Criteria | [17]<br>Nonresidential<br>Direct Contact<br>Criteria | [18]<br>Soil Residential<br>MSSL | [19]<br>Soil<br>Nonresidential<br>MSSL                                      | SS-24                                                                                        |             | SS-25                                                                                                                                                                       |             | SS-35                                                                                                                                                                                                       |         | Mickelson-6   |             | QMCP-SB64                   |          | QMCP-SS51                                          |           | QMCP-SS310               |         | QMCP-SS311  |         |             |         |
| Field Sample ID              |            |                                                                            |                                                                |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | SS 24                                                                                        |             | SS 25                                                                                                                                                                       |             | SS 35                                                                                                                                                                                                       |         | Mickelson B-6 |             | QMCP-SB 64 0in-6in          |          | QMCP-SB 64 6in-5ft                                 |           | QMCP-SS51-0-3in          |         | QMCP-SS 310 |         | QMCP-SS 311 |         |
| Sample Date                  |            |                                                                            |                                                                |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | 6/5/2002                                                                                     |             | 6/5/2002                                                                                                                                                                    |             | 6/5/2002                                                                                                                                                                                                    |         | 9/12/2007     |             | 9/7/2018                    |          | 9/7/2018                                           |           | 9/28/2018                |         | 9/24/2020   |         | 9/24/2020   |         |
| Sample Interval (bgs)        |            |                                                                            |                                                                |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | 0 - 4 in<br>0 - 12 in                                                                        |             | 0 - 12 in                                                                                                                                                                   |             | 0 - 4 in                                                                                                                                                                                                    |         | --            |             | 0 - 0.5 ft                  |          | 0.5 - 5 ft                                         |           | 0 - 0.25 ft              |         | 0 - 0.25 ft |         | 0 - 0.25 ft |         |
| Sample Description           |            |                                                                            |                                                                |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | 0-4" - Dry, dark brown/black, medium to coarse sand with black chips that appear to be coal. |             | 0-½" - Dry, black, coal chips with stamp sand. Medium gravel/coal on top. ½-4" - Slightly moist, black, medium to coarse sand/coal, some red , medium to coarse stamp sand. |             | 0-4" - Dry, dark brown, medium sand, with 50-70% black stamp sand. Sample was sieved through #30 size sieve. (Discrepancy in sample IDs in MDEQ H RTP 2002 report, description may actually refer to SS 34) |         | --            |             | SAND, Fine to medium, brown |          | SAND, Medium to coarse, brown, saturated at 5 feet |           | Soil in pile along trail |         | --          |         | --          |         |
|                              |            |                                                                            |                                                                |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | Result                                                                                       | Exceeds     | Result                                                                                                                                                                      | Exceeds     | Result                                                                                                                                                                                                      | Exceeds | Result        | Exceeds     | Result                      | Exceeds  | Result                                             | Exceeds   | Result                   | Exceeds | Result      | Exceeds | Result      | Exceeds |
| Inorganics - Metals (mg/kg)  |            |                                                                            |                                                                |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |                                                                                              |             |                                                                                                                                                                             |             |                                                                                                                                                                                                             |         |               |             |                             |          |                                                    |           |                          |         |             |         |             |         |
| ALUMINIUM                    | 7429-90-5  | NA                                                                         | 6900 (B)                                                       | NLV                                                                                               | ID                                                               | 50,000 (D,BB)                                        | 6,900 (B)                                                          | ID                                                                   | 3.7E+5 (D,BB)                                        | NA                               | NA                                                                          | 9,190                                                                                        | [4,11]      | 6,830                                                                                                                                                                       | --          | NM                                                                                                                                                                                                          | --      | 7,800 J       | [4,11]      | NM                          | --       | NM                                                 | --        | NM                       | --      | NM          | --      |             |         |
| ANTIMONY                     | 7440-36-0  | 1.2 (X)                                                                    | 4.3                                                            | NLV                                                                                               | 13,000                                                           | 180                                                  | 4.3                                                                | 5,900                                                                | 670                                                  | NA                               | NA                                                                          | <0.82 UJ                                                                                     | --          | 1.7 J                                                                                                                                                                       | [2]         | NM                                                                                                                                                                                                          | --      | NM            | --          | NM                          | --       | NM                                                 | --        | NM                       | --      | NM          | --      |             |         |
| ARSENIC                      | 7440-38-2  | 4.6                                                                        | 4.6                                                            | NLV                                                                                               | 720                                                              | 7.6                                                  | 4.6                                                                | 910                                                                  | 37                                                   | NA                               | NA                                                                          | 8.4                                                                                          | [2,4,10,11] | 14.9                                                                                                                                                                        | [2,4,10,11] | NM                                                                                                                                                                                                          | --      | 14 J          | [2,4,10,11] | 1.4                         | --       | 1.2                                                | --        | NM                       | --      | NM          | --      |             |         |
| BARIUM                       | 7440-39-3  | 130 (B,G)                                                                  | 1,300 (B)                                                      | NLV                                                                                               | 3.3E+5 (B)                                                       | 37,000 (B)                                           | 1,300 (B)                                                          | 1.5E+5 (B)                                                           | 1.3E+5 (B)                                           | NA                               | NA                                                                          | 40                                                                                           | --          | 41.5                                                                                                                                                                        | --          | NM                                                                                                                                                                                                          | --      | NM            | --          | NM                          | --       | NM                                                 | --        | NM                       | --      | NM          | --      |             |         |
| BERYLLIUM                    | 7440-41-7  | 24 (G)                                                                     | 51                                                             | NLV                                                                                               | 1,300                                                            | 410                                                  | 51                                                                 | 590                                                                  | 1,600                                                | NA                               | NA                                                                          | 0.27                                                                                         | --          | 0.36                                                                                                                                                                        | --          | NM                                                                                                                                                                                                          | --      | 0.73 J        | --          | NM                          | --       | NM                                                 | --        | NM                       | --      | NM          | --      |             |         |
| CADMIUM                      | 7440-43-9  | 1.6 (B,G,X)                                                                | 6.0 (B)                                                        | NLV                                                                                               | 1,700 (B)                                                        | 550 (B)                                              | 6.0 (B)                                                            | 2,200 (B)                                                            | 2,100 (B)                                            | NA                               | NA                                                                          | 0.23                                                                                         | --          | 0.29                                                                                                                                                                        | --          | NM                                                                                                                                                                                                          | --      | NM            | --          | <0.2 U                      | --       | <0.2 U                                             | --        | NM                       | --      | NM          | --      |             |         |
| CALCIUM                      | 7440-70-2  | NA                                                                         | NA                                                             | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | 14,100                                                                                       | --          | 6,270                                                                                                                                                                       | --          | NM                                                                                                                                                                                                          | --      | NM            | --          | NM                          | --       | NM                                                 | --        | NM                       | --      | NM          | --      |             |         |
| CHROMIUM                     | 7440-47-3  | 1.2E+6 (B,G,H,X)                                                           | 1.0E+6 (B,D,H)                                                 | NLV                                                                                               | 3.30E+8 (B,H)                                                    | 7.90E+5 (B,H)                                        | 1.00E+6 (B,D,H)                                                    | 1.50E+5 (B,H)                                                        | 1.00E+6 (B,D,H)                                      | NA                               | NA                                                                          | 22.7                                                                                         | --          | 12.7                                                                                                                                                                        | --          | NM                                                                                                                                                                                                          | --      | 980 J         | --          | 28                          | --       | 19                                                 | --        | NM                       | --      | NM          | --      |             |         |
| COBALT                       | 7440-48-4  | 2                                                                          | 0.8                                                            | NLV                                                                                               | 13,000                                                           | 2,600                                                | 2                                                                  | 5,900                                                                | 9,000                                                | NA                               | NA                                                                          | 18.6                                                                                         | [2,4,11]    | 17.3                                                                                                                                                                        | [2,4,11]    | NM                                                                                                                                                                                                          | --      | 16 J          | [2,4,11]    | NM                          | --       | NM                                                 | --        | NM                       | --      | NM          | --      |             |         |
| COPPER                       | 7440-50-8  | 32 (B,G)                                                                   | 5,800 (B)                                                      | NLV                                                                                               | 130,000 (B)                                                      | 20,000 (B)                                           | 5,800 (B)                                                          | 59,000 (B)                                                           | 73,000 (B)                                           | NA                               | NA                                                                          | 2,120 J                                                                                      | [2]         | 3,450 J                                                                                                                                                                     | [2]         | NM                                                                                                                                                                                                          | --      | 490 J         | [2]         | 3,200                       | [2]      | 6,100                                              | [2,4,11]  | NM                       | --      | NM          | --      |             |         |
| IRON                         | 7439-89-6  | --                                                                         | 12,000 (B)                                                     | NLV                                                                                               | ID                                                               | 160,000 (B)                                          | 12,000 (B)                                                         | ID                                                                   | 580,000 (B)                                          | NA                               | NA                                                                          | 22,700                                                                                       | [4,11]      | 24,700                                                                                                                                                                      | [4,11]      | NM                                                                                                                                                                                                          | --      | NM            | --          | NM                          | --       | NM                                                 | --        | NM                       | --      | NM          | --      |             |         |
| LEAD                         | 7439-92-1  | 2,500 (B,G,X)                                                              | 700 (B)                                                        | NLV                                                                                               | 100,000 (B)                                                      | 400 (B)                                              | 700 (B)                                                            | 44,000 (B)                                                           | 900 (B,DD)                                           | NA                               | NA                                                                          | 59.6 J                                                                                       | --          | 51.8 J                                                                                                                                                                      | --          | NM                                                                                                                                                                                                          | --      | 25 J          | --          | 15                          | --       | 14                                                 | --        | NM                       | --      | NM          | --      |             |         |
| LITHIUM                      | 7439-93-2  | 9.8 (B)                                                                    | 9.8 (B)                                                        | NLV                                                                                               | 2.30E+9 (B)                                                      | 4,200 (B,DD)                                         | 9.8 (B)                                                            | 1.00E+6 (B)                                                          | 31,000 (B,DD)                                        | NA                               | NA                                                                          | NM                                                                                           | --          | NM                                                                                                                                                                          | --          | NM                                                                                                                                                                                                          | --      | 4             | --          | NM                          | --       | NM                                                 | --        | NM                       | --      | NM          | --      |             |         |
| MAGNESIUM                    | 7439-95-4  | --                                                                         | 8,000 (B)                                                      | NLV                                                                                               | 6.70E+6 (B)                                                      | 1.0E+9 (B,D)                                         | 22,000 (B)                                                         | 2.90E+6 (B)                                                          | 1.00E+6 (B,D)                                        | NA                               | NA                                                                          | 9,390                                                                                        | [4]         | 6,820                                                                                                                                                                       | --          | NM                                                                                                                                                                                                          | --      | NM            | --          | NM                          | --       | NM                                                 | --        | NM                       | --      | NM          | --      |             |         |
| MANGANESE                    | 7439-96-5  | 440 (B,G,X)                                                                | 440 (B)                                                        | NLV                                                                                               | 3,300 (B)                                                        | 25,000 (B)                                           | 440 (B)                                                            | 1,500 (B)                                                            | 90,000 (B)                                           | NA                               | NA                                                                          | 458                                                                                          | [2,4,11]    | 368                                                                                                                                                                         | --          | NM                                                                                                                                                                                                          | --      | 650           | [2,4,11]    | 630                         | [2,4,11] | 600                                                | [2,4,11]  | NM                       | --      | NM          | --      |             |         |
| MERCURY                      | 7439-97-6  | 0.13 (B,Z)                                                                 | 1.7 (B,Z)                                                      | 48 (B,Z)                                                                                          | 20,000 (B,Z)                                                     | 160 (B,Z)                                            | 1.7 (B,Z)                                                          | 8,800 (B,Z)                                                          | 580 (B,Z)                                            | 0.022 (M)                        | 0.066                                                                       | 0.14 J                                                                                       | [2,18,19]   | 0.2 J                                                                                                                                                                       | [2,18,19]   | NM                                                                                                                                                                                                          | --      | 0.015 J       | --          | 0.1                         | [18,19]  | 0.3                                                | [2,18,19] | NM                       | --      | NM          | --      |             |         |
| NICKEL                       | 7440-02-0  | 29 (G)                                                                     | 100 (B)                                                        | NLV                                                                                               | 13,000 (B)                                                       | 40,000 (B)                                           | 100 (B)                                                            | 16,000 (B)                                                           | 1.50E+5 (B)                                          | NA                               | NA                                                                          | 28.1                                                                                         | --          | 18.8                                                                                                                                                                        | --          | NM                                                                                                                                                                                                          | --      | 180 J         | [2,4,11]    | NM                          | --       | NM                                                 | --        | NM                       | --      | NM          | --      |             |         |
| POTASSIUM                    | 7440-09-7  | NA                                                                         | NA                                                             | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | 274                                                                                          | --          | 214 J                                                                                                                                                                       | --          | NM                                                                                                                                                                                                          | --      | NM            | --          | NM                          | --       | NM                                                 | --        | NM                       | --      | NM          | --      |             |         |
| SELENIUM                     | 7782-49-2  | 0.41 (B)                                                                   | 4.0 (B)                                                        | NLV                                                                                               | 130,000 (B)                                                      | 2,600 (B)                                            | 4.0 (B)                                                            | 59,000 (B)                                                           | 9,600 (B)                                            | NA                               | NA                                                                          | 1.5 J                                                                                        | [2]         | 2.3 J                                                                                                                                                                       | [2]         | NM                                                                                                                                                                                                          | --      | NM            | --          | NM                          | --       | NM                                                 | --        | NM                       | --      | NM          | --      |             |         |
| SILVER                       | 7440-22-4  | 1.0 (B,M)                                                                  | 4.5 (B)                                                        | NLV                                                                                               | 6700 (B)                                                         | 2500 (B)                                             | 13 (B)                                                             | 2,900 (B)                                                            | 9,000 (B)                                            | NA                               | NA                                                                          | 1.3 J                                                                                        | [2]         | 2.6 J                                                                                                                                                                       | [2]         | NM                                                                                                                                                                                                          | --      | 0.51 J        | --          | 4.1                         | [2]      | 5.8                                                | [2,4]     | NM                       | --      | NM          | --      |             |         |
| SODIUM                       | 7440-23-5  | NA                                                                         | 4,600                                                          | NLV                                                                                               | ID                                                               | 1.0E+6 (D)                                           | NA                                                                 | ID                                                                   | 1.0E+6 (D)                                           | NA                               | NA                                                                          | 741 J                                                                                        | --          | 682 J                                                                                                                                                                       | --          | NM                                                                                                                                                                                                          | --      | NM            | --          | NM                          | --       | NM                                                 | --        | NM                       | --      | NM          | --      |             |         |
| VANADIUM                     | 7440-62-2  | 430                                                                        | 72                                                             | NLV                                                                                               | ID                                                               | 750 (DD)                                             | 990                                                                | ID                                                                   | 5,500 (DD)                                           | NA                               | NA                                                                          | 35.2                                                                                         | --          | 34.5                                                                                                                                                                        | --          | NM                                                                                                                                                                                                          | --      | NM            | --          | NM                          | --       | NM                                                 | --        | NM                       | --      | NM          | --      |             |         |
| ZINC                         | 7440-66-6  | 62 (B,G)                                                                   | 2,400 (B)                                                      | NLV                                                                                               | ID                                                               | 1.70E+5 (B)                                          | 5,000 (B)                                                          | ID                                                                   | 6.30E+5 (B)                                          | NA                               | NA                                                                          | 90.3 J                                                                                       | [2]         | 82.3 J                                                                                                                                                                      | [2]         | NM                                                                                                                                                                                                          | --      | 43            | --          | 77                          | [2]      | 72                                                 | [2]       | NM                       | --      | NM          | --      |             |         |
| Inorganics - Cyanide (mg/kg) |            |                                                                            |                                                                |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |                                                                                              |             |                                                                                                                                                                             |             |                                                                                                                                                                                                             |         |               |             |                             |          |                                                    |           |                          |         |             |         |             |         |
| CYANIDE                      | 57-12-5    | 0.1 (P,R)                                                                  | 4.0 (P,R)                                                      | NLV                                                                                               | 250 (P,R)                                                        | 12 (P,R)                                             | 4.0 (P,R)                                                          | 250 (P,R)                                                            | 250 (P,R)                                            | NA                               | NA                                                                          | 12.5 J                                                                                       | [2,4,10,11] | <0.04 UJ                                                                                                                                                                    | --          | NM                                                                                                                                                                                                          | --      | NM            | --          | NM                          | --       | NM                                                 | --        | NM                       | --      | NM          | --      |             |         |
| Organics - PCBs (ug/kg)      |            |                                                                            |                                                                |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |                                                                                              |             |                                                                                                                                                                             |             |                                                                                                                                                                                                             |         |               |             |                             |          |                                                    |           |                          |         |             |         |             |         |
| AROCLO-1260                  | 11096-82-5 | NA                                                                         | NA                                                             | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | <350 U                                                                                       | --          | <37 U                                                                                                                                                                       | --          | NM                                                                                                                                                                                                          | --      | <42 U         | --          | NM                          | --       | NM                                                 | --        | NM                       | --      | NM          | --      |             |         |
| AROCLO-1262                  | 37324-23-5 | NA                                                                         | NA                                                             | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM                                                                                           | --          | NM                                                                                                                                                                          | --          | NM                                                                                                                                                                                                          | --      | <42 U         | --          | NM                          | --       | NM                                                 | --        | NM                       | --      | NM          | --      |             |         |
| TOTAL PCBs                   | 1336-36-6  | NLL                                                                        | NLL                                                            | 3.00E+6 (J,T)                                                                                     | 5.20E+6 (J,T)                                                    | 1,000 (J,T)                                          | NLL                                                                | 6.50E+6 (J,T)                                                        | 1,000 (J,T)                                          | NA                               | NA                                                                          | ND                                                                                           | --          | ND                                                                                                                                                                          | --          | NM                                                                                                                                                                                                          | --      | <42 U         | --          | NM                          | --       | NM                                                 | --        | NM                       | --      | NM          | --      |             |         |
| Organics - SVOCs (ug/kg)     |            |                                                                            |                                                                |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |                                                                                              |             |                                                                                                                                                                             |             |                                                                                                                                                                                                             |         |               |             |                             |          |                                                    |           |                          |         |             |         |             |         |
| 1,1-BIPHENYL                 | 92-52-4    | NA                                                                         | NA                                                             | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | <22000 U                                                                                     | --          | 1,300 J                                                                                                                                                                     | --          | NM                                                                                                                                                                                                          | --      | NM            | --          | NM                          | --       | NM                                                 | --        | NM                       | --      | NM          | --      |             |         |
| 2-METHYLNAPHTHALENE (SVOC)   | 91-57-6S   | 4,200                                                                      | 57,000                                                         | 2.70E+06                                                                                          | 6.70E+08                                                         | 8.10E+06                                             | 1.70E+05                                                           | 2.90E+08                                                             | 2.60E+07                                             | NA                               | NA                                                                          | <22000 U                                                                                     | --          | 15,000                                                                                                                                                                      | [2]         | NM                                                                                                                                                                                                          | --      | NM            | --          | <540 U                      | --       | <540 U                                             | --        | 660                      | --      | 420         | --      |             |         |
| ACENAPHTHENE                 | 83-32-9    | 8,700                                                                      | 3.00E+05                                                       | 1.90E+08                                                                                          | 1.40E+10                                                         | 4.10E+07                                             | 8.80E+05                                                           | 6.20E+09                                                             | 1.30E+08                                             | NA                               | NA                                                                          | <22000 U                                                                                     | --          | <11000 U                                                                                                                                                                    | --          | NM                                                                                                                                                                                                          | --      | NM            | --          | <210 U                      | --       | <220 U                                             | --        | <240 U                   | --      | <110 U      | --      |             |         |
| ACENAPHTHYLENE               | 208-96-8   | ID                                                                         | 5,900                                                          | 1.60E+06                                                                                          | 2.30E+09                                                         | 1.60E+06                                             | 17,000                                                             | 1.00E+09                                                             | 5.20E+06                                             | NA                               | NA                                                                          | 4,600 J                                                                                      | --          | <11000 U                                                                                                                                                                    | --          | NM                                                                                                                                                                                                          | --      | NM            | --          | <210 U                      | --       | <220 U                                             | --        | 1,500                    | --      | <110 U      | --      |             |         |
| ACETOPHENONE                 | 98-86-2    | ID                                                                         | 30,000                                                         | 1.20E+8 (C)                                                                                       | 3.30E+10                                                         | 4.70E+7 (C)                                          | 88,000                                                             | 1.40E+10                                                             | 1.50E+8 (C)                                          | NA                               | NA                                                                          | <22000 U                                                                                     | --          | 1,300 J                                                                                                                                                                     | --          | NM                                                                                                                                                                                                          | --      | NM            | --          | NM                          | --       | NM                                                 | --        | NM                       | --      | NM          | --      |             |         |
| ANTHRACENE                   | 120-12-7   | ID                                                                         | 41,000                                                         | 1.00E+9 (D)                                                                                       | 6.70E+10                                                         | 2.30E+08                                             | 41,000                                                             | 2.90E+10                                                             | 7.30E+08                                             | NA                               | NA                                                                          | 22,000 J                                                                                     | --          | <11000 U                                                                                                                                                                    | --          | NM                                                                                                                                                                                                          | --      | NM            | --          | <210 U                      | --       | <220 U                                             | --        | 1,600                    | --      | <110 U      | --      |             |         |
| BENZALDEHYDE                 | 100-52-7   | NA                                                                         | NA                                                             | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | <22000 UJ                                                                                    | --          | 1,600 J                                                                                                                                                                     | --          | NM                                                                                                                                                                                                          | --      | NM            | --          | NM                          | --       | NM                                                 | --        | NM                       | --      | NM          | --      |             |         |
| BENZO(A)ANTHRACENE           | 56-55-3    | NLL                                                                        | NLL                                                            | NLV                                                                                               | ID                                                               | 20,000 (Q)                                           | NLL                                                                | ID                                                                   | 80,000 (Q)                                           | NA                               | NA                                                                          | 11,000 J                                                                                     | --          | 1,800 J                                                                                                                                                                     | --          | NM                                                                                                                                                                                                          | --      | NM            | --          | 550                         | --       | <220 U                                             | --        | 13,000                   | --      | 400         | --      |             |         |
| BENZO(A)PYRENE               | 50-32-8    | NLL                                                                        | NLL                                                            | NLV                                                                                               | 1.50E+8 (Q)                                                      | 2,000 (Q)                                            | NLL                                                                | 1.90E+6 (Q)                                                          | 8,000 (Q)                                            | NA                               | NA                                                                          | 10,000 J                                                                                     | [10,17]     | 1,300 J                                                                                                                                                                     | --          | NM                                                                                                                                                                                                          | --      | NM            | --          | 530                         | --       | <430 U                                             | --        | 12,000                   | [10,17] | 490         | --      |             |         |
| BENZO(B)FLUORANTHENE         | 205-99-2   | NLL                                                                        | NLL                                                            | ID                                                                                                | ID                                                               | 20,000 (Q)                                           | NLL                                                                | ID                                                                   | 80,000 (Q)                                           | NA                               | NA                                                                          | 12,000 J                                                                                     | --          | 1,700 J                                                                                                                                                                     | --          | NM                                                                                                                                                                                                          | --      | NM            | --          | 990                         | --       | <430 U                                             | --        | 26,000                   | [10]    | 960         | --      |             |         |
| BENZO(G,H,I)PERYLENE         | 191-24-2   | NLL                                                                        | NLL                                                            | NLV                                                                                               | 8.00E+08                                                         | 2.50E+06                                             | NLL                                                                | 3.50E+08                                                             | 7.00E+06                                             | NA                               | NA                                                                          | 7,600 J                                                                                      | --          | <11000 U                                                                                                                                                                    | --          | NM                                                                                                                                                                                                          | --      | NM            | --          | <430 U                      | --       | <430 U                                             | --        | 3,500                    | --      | 280         | --      |             |         |
| BENZO(K)FLUORANTHENE         | 207-08-9   | NLL                                                                        | NLL                                                            | NLV                                                                                               | ID                                                               | 2.00E+5 (Q)                                          | NLL                                                                | ID                                                                   | 8.00E+5 (Q)                                          | NA                               | NA                                                                          | 10,000 J                                                                                     | --          | 1,400 J                                                                                                                                                                     | --          | NM                                                                                                                                                                                                          | --      | NM            | --          | <430 U                      | --       | <430 U                                             | --        | 8,800                    | --      | 300         | --      |             |         |
| BIS(2-ETHYLHEXYL)PHTHALATE   | 117-81-7   | NLL                                                                        | NLL                                                            | NLV                                                                                               | 7.00E+08                                                         | 2.80E+06                                             | NLL                                                                | 8.90E+08                                                             | 1.20E+7 (C)                                          | NA                               | NA                                                                          | <22000 UJ                                                                                    | --          | <11000 U                                                                                                                                                                    | --          | NM                                                                                                                                                                                                          | --      | NM            | --          | NM                          | --       | NM                                                 | --        | NM                       | --      | NM          | --      |             |         |
| BUTYL BENZYL PHTHALATE       | 85-68-7    | 13,000 (X)                                                                 | 2.20E+6 (C)                                                    | NLV                                                                                               | 4.70E+10                                                         | 3.60E+10 (C)                                         | 5.00E+6 (C)                                                        | 2.10E+10                                                             | 1.20E+8 (C)                                          | NA                               | NA                                                                          | <22000 UJ                                                                                    | --          | <11000 U                                                                                                                                                                    | --          | NM                                                                                                                                                                                                          | --      | NM            | --          | NM                          | --       | NM                                                 | --        | NM                       | --      | NM          | --      |             |         |
| CHRYSENE                     | 218-01-9   | NLL                                                                        | NLL                                                            | ID                                                                                                | ID                                                               | 2.00E+6 (Q)                                          | NLL                                                                | ID                                                                   | 8.00E+6 (Q)                                          | NA                               | NA                                                                          | 12,000 J                                                                                     | --          | 2,700 J                                                                                                                                                                     | --          | NM                                                                                                                                                                                                          | --      | NM            | --          | 5                           |          |                                                    |           |                          |         |             |         |             |         |

**TABLE 8-1**  
**Summary of Soil Analytical Results**  
**Area F**  
**Quincy Mining Company Portage Operations Area**  
**Abandoned Mining Wastes - Torch Lake Non-Superfund Site**

| Location Code                      |            | EGLE Part 201 Generic Cleanup Criteria                         |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                  | Area F                                                                                       |              |                                                                                                                                                                             |              |                                                                                                                                                                                                             |                |               |         |                             |         |                                                    |         |                          |                |             |         |             |      |
|------------------------------------|------------|----------------------------------------------------------------|-------------------------------------------------------|---------------------------------------------------------------------------------|---------------------------------------------------------|---------------------------------------------|-----------------------------------------------------------|-------------------------------------------------------------|------------------------------------------------|-----------------------------------------------------------------------------|----------------------------------|----------------------------------------------------------------------------------------------|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|---------------|---------|-----------------------------|---------|----------------------------------------------------|---------|--------------------------|----------------|-------------|---------|-------------|------|
| Station Name                       | CAS Number | [2]<br>Groundwater Surface Water Interface Protection Criteria | [4]<br>Residential Drinking Water Protection Criteria | [5]<br>Residential Soil Volatilization to Indoor Air Inhalation Criteria (VSIC) | [9]<br>Residential Particulate Soil Inhalation Criteria | [10]<br>Residential Direct Contact Criteria | [11]<br>Nonresidential Drinking Water Protection Criteria | [16]<br>Nonresidential Particulate Soil Inhalation Criteria | [17]<br>Nonresidential Direct Contact Criteria | [18]<br>Soil Residential MSSL                                               | [19]<br>Soil Nonresidential MSSL | SS-24                                                                                        |              | SS-25                                                                                                                                                                       |              | SS-35                                                                                                                                                                                                       |                | Mickelson-6   |         | QMCP-SB64                   |         |                                                    |         | QMCP-SS51                |                | QMCP-SS310  |         | QMCP-SS311  |      |
| Field Sample ID                    |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                                                                             |                                  | SS 24                                                                                        |              | SS 25                                                                                                                                                                       |              | SS 35                                                                                                                                                                                                       |                | Mickelson B-6 |         | QMCP-SB 64 0in-6in          |         | QMCP-SB 64 6in-5ft                                 |         | QMCP-SS51-0-3in          |                | QMCP-SS 310 |         | QMCP-SS 311 |      |
| Sample Date                        |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                                                                             |                                  | 6/5/2002                                                                                     |              | 6/5/2002                                                                                                                                                                    |              | 6/5/2002                                                                                                                                                                                                    |                | 9/12/2007     |         | 9/7/2018                    |         | 9/7/2018                                           |         | 9/28/2018                |                | 9/24/2020   |         | 9/24/2020   |      |
| Sample Interval (bgs)              |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                                                                             |                                  | 0 - 4 in<br>0 - 12 in                                                                        |              | 0 - 12 in                                                                                                                                                                   |              | 0 - 4 in                                                                                                                                                                                                    |                | --            |         | 0 - 0.5 ft                  |         | 0.5 - 5 ft                                         |         | 0 - 0.25 ft              |                | 0 - 0.25 ft |         | 0 - 0.25 ft |      |
| Sample Description                 |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                                                                             |                                  | 0-4" - Dry, dark brown/black, medium to coarse sand with black chips that appear to be coal. |              | 0-½" - Dry, black, coal chips with stamp sand. Medium gravel/coal on top. ¾-4" - Slightly moist, black, medium to coarse sand/coal, some red , medium to coarse stamp sand. |              | 0-4" - Dry, dark brown, medium sand, with 50-70% black stamp sand. Sample was sieved through #30 size sieve. (Discrepancy in sample IDs in MDEQ H RTP 2002 report, description may actually refer to SS 34) |                | --            |         | SAND, Fine to medium, brown |         | SAND, Medium to coarse, brown, saturated at 5 feet |         | Soil in pile along trail |                | --          |         | --          |      |
|                                    |            | Result                                                         | Exceeds                                               | Result                                                                          | Exceeds                                                 | Result                                      | Exceeds                                                   | Result                                                      | Exceeds                                        | Result                                                                      | Exceeds                          | Result                                                                                       | Exceeds      | Result                                                                                                                                                                      | Exceeds      | Result                                                                                                                                                                                                      | Exceeds        | Result        | Exceeds | Result                      | Exceeds | Result                                             | Exceeds | Result                   | Exceeds        | Result      | Exceeds |             |      |
| Organics - SVOCs (ug/kg) Continued |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                                                                             |                                  |                                                                                              |              |                                                                                                                                                                             |              |                                                                                                                                                                                                             |                |               |         |                             |         |                                                    |         |                          |                |             |         |             |      |
| DIBENZO(A,H)ANTHRACENE             | 53-70-3    | NLL                                                            | NLL                                                   | NLV                                                                             | ID                                                      | 2,000 (Q)                                   | NLL                                                       | ID                                                          | 8,000 (Q)                                      | NA                                                                          | NA                               | <22000 U                                                                                     | --           | <11000 U                                                                                                                                                                    | --           | NM                                                                                                                                                                                                          | --             | NM            | --      | <430 U                      | --      | <430 U                                             | --      | 2,800                    | [10]           | <220 U      | --      | <220 U      | --   |
| DIBENZOFURAN                       | 132-64-9   | 1,700                                                          | ID                                                    | 2.00E+06                                                                        | 6.70E+06                                                | ID                                          | ID                                                        | 2.90E+06                                                    | ID                                             | NA                                                                          | NA                               | <22000 U                                                                                     | --           | 4,000 J                                                                                                                                                                     | [2]          | NM                                                                                                                                                                                                          | --             | NM            | --      | NM                          | --      | NM                                                 | --      | NM                       | --             | NM          | --      | NM          | --   |
| FLUORANTHENE                       | 206-44-0   | 5,500                                                          | 730,000                                               | 1.00E+9 (D)                                                                     | 9.30E+09                                                | 4.60E+07                                    | 730,000                                                   | 4.10E+09                                                    | 1.30E+08                                       | NA                                                                          | NA                               | 25,000                                                                                       | [2]          | 2,900 J                                                                                                                                                                     | --           | NM                                                                                                                                                                                                          | --             | NM            | --      | 1,100                       | --      | <220 U                                             | --      | 30,000                   | [2]            | 720         | --      | 1,200       | --   |
| FLUORENE                           | 86-73-7    | 5,300                                                          | 390,000                                               | 5.80E+08                                                                        | 9.30E+09                                                | 2.70E+07                                    | 890,000                                                   | 4.10E+09                                                    | 8.70E+07                                       | NA                                                                          | NA                               | <22000 U                                                                                     | --           | <11000 U                                                                                                                                                                    | --           | NM                                                                                                                                                                                                          | --             | NM            | --      | <210 U                      | --      | <220 U                                             | --      | 310                      | --             | <110 U      | --      | <110 U      | --   |
| INDENO(1,2,3-CD)PYRENE             | 193-39-5   | NLL                                                            | NLL                                                   | NLV                                                                             | ID                                                      | 20,000 (Q)                                  | NLL                                                       | ID                                                          | 80,000 (Q)                                     | NA                                                                          | NA                               | 7,400 J                                                                                      | --           | <11000 U                                                                                                                                                                    | --           | NM                                                                                                                                                                                                          | --             | NM            | --      | <430 U                      | --      | <430 U                                             | --      | 4,400                    | --             | 260         | --      | 330         | --   |
| NAPHTHALENE (SVOC)                 | 91-20-3S   | 730                                                            | 35,000                                                | 2.50E+05                                                                        | 2.00E+08                                                | 1.60E+07                                    | 1.00E+05                                                  | 8.80E+07                                                    | 5.20E+07                                       | NA                                                                          | NA                               | 2,200 J                                                                                      | [2]          | 9,300 J                                                                                                                                                                     | [2]          | NM                                                                                                                                                                                                          | --             | NM            | --      | <210 U                      | --      | <220 U                                             | --      | 1,500                    | [2]            | 300         | --      | 250         | --   |
| PHENANTHRENE                       | 85-01-8    | 2,100                                                          | 56,000                                                | 2.80E+06                                                                        | 6.70E+06                                                | 1.60E+06                                    | 1.60E+05                                                  | 2.90E+06                                                    | 5.20E+06                                       | NA                                                                          | NA                               | 13,000 J                                                                                     | [2]          | 9,400 J                                                                                                                                                                     | [2]          | NM                                                                                                                                                                                                          | --             | NM            | --      | 560                         | --      | <220 U                                             | --      | 8,000                    | [2]            | 420         | --      | 630         | --   |
| PYRENE                             | 129-00-0   | ID                                                             | 4.80E+05                                              | 1.00E+9 (D)                                                                     | 6.70E+09                                                | 2.90E+07                                    | 4.80E+05                                                  | 2.90E+09                                                    | 8.40E+07                                       | NA                                                                          | NA                               | 20,000 J                                                                                     | --           | 2,900 J                                                                                                                                                                     | --           | NM                                                                                                                                                                                                          | --             | NM            | --      | 900                         | --      | <220 U                                             | --      | 23,000                   | --             | 730         | --      | 960         | --   |
| Organics - VOCs (ug/kg)            |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                                                                             |                                  |                                                                                              |              |                                                                                                                                                                             |              |                                                                                                                                                                                                             |                |               |         |                             |         |                                                    |         |                          |                |             |         |             |      |
| 1,2,3-TRIMETHYLBENZENE             | 526-73-8   | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | 270 (JT)                                                                    | 800 (JT)                         | NM                                                                                           | --           | NM                                                                                                                                                                          | --           | NM                                                                                                                                                                                                          | --             | NM            | --      | <59 U                       | --      | <59 U                                              | --      | <83 U                    | --             | 64          | --      | 65          | --   |
| 1,2,4-TRIMETHYLBENZENE             | 95-63-6    | 570 (I)                                                        | 2,100 (I)                                             | 4.3E+6 (C,I)                                                                    | 8.20E+10 (I)                                            | 3.2E+07 (C,I)                               | 2,100 (I)                                                 | 3.60E+10 (I)                                                | 1.00E+8 (C,I)                                  | 150 (JT)                                                                    | 430 (JT)                         | 920                                                                                          | [2,18,19]    | 920                                                                                                                                                                         | [2,18,19]    | 1,800                                                                                                                                                                                                       | [2,18,19]      | NM            | --      | 58 J                        | --      | 66                                                 | --      | <83 U                    | --             | 140         | --      | 140         | --   |
| 1,3,5-TRIMETHYLBENZENE             | 108-67-8   | 1,100 (I)                                                      | 1,800 (I)                                             | 2.6E+6 (C,I)                                                                    | 8.20E+10 (I)                                            | 3.2E+07 (C)                                 | 2,100 (I)                                                 | 3.60E+10 (I)                                                | 1.00E+8 (C,I)                                  | 100 (JT)                                                                    | 300 (JT)                         | 200                                                                                          | [18]         | 200                                                                                                                                                                         | [18]         | 490                                                                                                                                                                                                         | [18,19]        | NM            | --      | <59 U                       | --      | <59 U                                              | --      | <83 U                    | --             | <59 U       | --      | <61 U       | --   |
| 2,2,4-TRIMETHYLPENTANE             | 540-84-1   | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                                                                          | NA                               | NM                                                                                           | --           | NM                                                                                                                                                                          | --           | NM                                                                                                                                                                                                          | --             | NM            | --      | <290 U                      | --      | <290 U                                             | --      | <410 U                   | --             | <300 U      | --      | <310 U      | --   |
| 2-METHYLNAPHTHALENE (VOC)          | 91-57-6V   | 4,200                                                          | 57,000                                                | 2.70E+06                                                                        | 6.70E+08                                                | 8.10E+06                                    | 1.70E+05                                                  | 2.90E+08                                                    | 2.60E+07                                       | NA                                                                          | NA                               | 2,600                                                                                        | --           | 2,000                                                                                                                                                                       | --           | 12,000                                                                                                                                                                                                      | [2]            | NM            | --      | <290 U                      | --      | <290 U                                             | --      | <410 U                   | --             | 340         | --      | 340         | --   |
| BENZENE                            | 71-43-2    | 240 (I,X)                                                      | 100 (I)                                               | 1,600 (I)                                                                       | 3.80E+8 (I)                                             | 1.8E+5 (I)                                  | 100 (I)                                                   | 4.70E+8 (I)                                                 | 8.40E+5 (C,I)                                  | 1.7 (M)                                                                     | 7.9 (M)                          | 210                                                                                          | [4,11,18,19] | 170                                                                                                                                                                         | [4,11,18,19] | 1,500                                                                                                                                                                                                       | [2,4,11,18,19] | NM            | --      | <59 U                       | --      | <59 U                                              | --      | <83 U                    | --             | <59 U       | --      | <61 U       | --   |
| CYCLOHEXANE                        | 110-82-7   | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                                                                          | NA                               | NM                                                                                           | --           | NM                                                                                                                                                                          | --           | NM                                                                                                                                                                                                          | --             | NM            | --      | <290 U                      | --      | <290 U                                             | --      | <410 U                   | --             | <300 U      | --      | <310 U      | --   |
| ETHYLBENZENE                       | 100-41-4   | 360                                                            | 1,500                                                 | 87,000                                                                          | 1.00E+10                                                | 2.20E+07                                    | 1,500                                                     | 1.30E+10                                                    | 7.10E+07                                       | 12 (M)                                                                      | 57                               | 400                                                                                          | [2,18,19]    | 290                                                                                                                                                                         | [18,19]      | 490                                                                                                                                                                                                         | [2,18,19]      | NM            | --      | <59 U                       | --      | <59 U                                              | --      | <83 U                    | --             | <59 U       | --      | <61 U       | --   |
| HEXANE                             | 110-54-3   | NA                                                             | 1.8E+5 (C)                                            | 5.1E+5 (C)                                                                      | 1.30E+10                                                | 9.2E+7 (C)                                  | 5.10E+5 (C)                                               | 5.90E+09                                                    | 3.00E+8 (C)                                    | 25                                                                          | 74                               | NM                                                                                           | --           | NM                                                                                                                                                                          | --           | NM                                                                                                                                                                                                          | --             | NM            | --      | <59 U                       | --      | <59 U                                              | --      | <83 U                    | --             | <59 U       | --      | <61 U       | --   |
| ISOPROPYLBENZENE                   | 98-82-8    | 3,200                                                          | 91,000                                                | 4.00E+5 (C)                                                                     | 5.80E+09                                                | 2.50E+7 (C)                                 | 2.60E+05                                                  | 2.60E+09                                                    | 8.00E+7 (C)                                    | NA                                                                          | NA                               | 270                                                                                          | --           | 220                                                                                                                                                                         | --           | 330                                                                                                                                                                                                         | --             | NM            | --      | <59 U                       | --      | <59 U                                              | --      | <83 U                    | --             | <59 U       | --      | <61 U       | --   |
| M,P-XYLENE                         | 1330-20-7  | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                                                                          | NA                               | 1,500                                                                                        | --           | 1,400                                                                                                                                                                       | --           | 2,700                                                                                                                                                                                                       | --             | NM            | --      | <120 U                      | --      | 130                                                | --      | <170 U                   | --             | 210         | --      | 200         | --   |
| NAPHTHALENE (VOC)                  | 91-20-3V   | 730                                                            | 35,000                                                | 2.50E+05                                                                        | 2.00E+08                                                | 1.60E+07                                    | 1.00E+05                                                  | 8.80E+07                                                    | 5.20E+07                                       | NA                                                                          | NA                               | 2,600                                                                                        | [2]          | 1,700                                                                                                                                                                       | [2]          | 26,000                                                                                                                                                                                                      | [2]            | NM            | --      | <290 U                      | --      | <290 U                                             | --      | 500                      | --             | 310         | --      | <310 U      | --   |
| N-PROPYLBENZENE                    | 103-65-1   | ID                                                             | 1,600 (I)                                             | ID                                                                              | 1.30E+9 (I)                                             | 2.50E+6 (I)                                 | 4,600                                                     | 5.90E+08                                                    | 8.00E+06                                       | 1,800                                                                       | 3,500                            | 310                                                                                          | --           | 210                                                                                                                                                                         | --           | 360                                                                                                                                                                                                         | --             | NM            | --      | <59 U                       | --      | <59 U                                              | --      | <83 U                    | --             | <59 U       | --      | <61 U       | --   |
| O-XYLENE                           | 95-47-6    | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                                                                          | NA                               | 1,300                                                                                        | --           | 1,200                                                                                                                                                                       | --           | 2,100                                                                                                                                                                                                       | --             | NM            | --      | 76                          | --      | 78                                                 | --      | 84                       | --             | 170         | --      | 150         | --   |
| P-ISOPROPYL TOLUENE (p-CYMENE)     | 99-87-6    | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                                                                          | NA                               | 73                                                                                           | --           | 89                                                                                                                                                                          | --           | <270 U                                                                                                                                                                                                      | --             | NM            | --      | NM                          | --      | NM                                                 | --      | NM                       | --             | NM          | --      | NM          | --   |
| SEC-BUTYLBENZENE                   | 135-98-8   | ID                                                             | 1,600                                                 | ID                                                                              | 4.00E+08                                                | 2.50E+06                                    | 4,600                                                     | 1.80E+08                                                    | 8.00E+06                                       | NA                                                                          | NA                               | 100                                                                                          | --           | 77                                                                                                                                                                          | --           | <270 U                                                                                                                                                                                                      | --             | NM            | --      | <59 U                       | --      | <59 U                                              | --      | <83 U                    | --             | <59 U       | --      | <61 U       | --   |
| STYRENE                            | 100-42-5   | 530 (X)                                                        | 2,700                                                 | 2.50E+05                                                                        | 5.50E+09                                                | 4.00E+05                                    | 2,700                                                     | 6.90E+09                                                    | 1.90E+6 (C)                                    | NA                                                                          | NA                               | <63 U                                                                                        | --           | <54 U                                                                                                                                                                       | --           | <270 U                                                                                                                                                                                                      | --             | NM            | --      | <59 U                       | --      | <59 U                                              | --      | <83 U                    | --             | <59 U       | --      | <61 U       | --   |
| TETRACHLOROETHYLENE                | 127-18-4   | 220 (X)                                                        | 100                                                   | 11,000                                                                          | 2.70E+09                                                | 2.0E+5 (C)                                  | 100                                                       | 1.20E+09                                                    | 9.30E+5 (C)                                    | 6.2 (M)                                                                     | 12 (M)                           | <63 U                                                                                        | --           | <54 U                                                                                                                                                                       | --           | <270 U                                                                                                                                                                                                      | --             | NM            | --      | <59 U                       | --      | <59 U                                              | --      | 2,000                    | [2,4,11,18,19] | <59 U       | --      | <61 U       | --   |
| TOLUENE                            | 108-88-3   | 5,400 (I)                                                      | 16,000 (I)                                            | 3.30E+5 (C,I)                                                                   | 2.70E+10 (I)                                            | 5E+07 (C,I)                                 | 16,000 (I)                                                | 1.20E+10 (I)                                                | 1.60E+8 (C,I)                                  | 3,700                                                                       | 11,000                           | 1,400                                                                                        | --           | 1,000                                                                                                                                                                       | --           | 2,800                                                                                                                                                                                                       | --             | NM            | --      | 72                          | --      | 100                                                | --      | 120                      | --             | 160         | --      | 130         | --   |
| XYLENE - TOTAL                     | 1330-20-7  | 980 (I)                                                        | 5,600 (I)                                             | 6.30E+6 (I)                                                                     | 2.90E+11 (I)                                            | 4.1E+08 (C,I)                               | 5,600 (I)                                                 | 1.30E+11 (I)                                                | 1.00E+9 (C,D,I)                                | 280 (J)                                                                     | 830 (J)                          | 2,800                                                                                        | [2,18,19]    | 2,600                                                                                                                                                                       | [2,18,19]    | 4,800                                                                                                                                                                                                       | [2,18,19]      | NM            | --      | 76                          | --      | 208                                                | --      | 84                       | [18]           | 380         | [18]    | 350         | [18] |
| Organics - Pesticides (ug/kg)      |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                                                                             |                                  |                                                                                              |              |                                                                                                                                                                             |              |                                                                                                                                                                                                             |                |               |         |                             |         |                                                    |         |                          |                |             |         |             |      |
| 4,4-DDE                            | 72-55-9    | NLL                                                            | NLL                                                   | NLV                                                                             | 3.20E+07                                                | 45,000                                      | NLL                                                       | 4.00E+07                                                    | 1.90E+05                                       | NA                                                                          | NA                               | 39 J                                                                                         | --           | 13                                                                                                                                                                          | --           | NM                                                                                                                                                                                                          | --             | NM            | --      | NM                          | --      | NM                                                 | --      | NM                       | --             | NM          | --      | NM          | --   |
| 4,4-DDT                            | 50-29-3    | NLL                                                            | NLL                                                   | NLV                                                                             | 3.20E+07                                                | 57,000                                      | NLL                                                       | 4.00E+07                                                    | 2.80E+05                                       | NA                                                                          | NA                               | <35 U                                                                                        | --           | 12                                                                                                                                                                          | --           | NM                                                                                                                                                                                                          | --             | NM            | --      | NM                          | --      | NM                                                 | --      | NM                       | --             | NM          | --      | NM          | --   |
| ALDRIN                             | 309-00-2   | NLL                                                            | NLL                                                   | 1.30E+06                                                                        | 6.40E+05                                                | 1,000                                       | NLL                                                       | 8.00E+05                                                    | 4,300                                          | NA                                                                          | NA                               | <18 U                                                                                        | --           | 4.2                                                                                                                                                                         | --           | NM                                                                                                                                                                                                          | --             | NM            | --      | NM                          | --      | NM                                                 | --      | NM                       | --             | NM          | --      | NM          | --   |
| ALPHA-CHLORDANE                    | 5103-71-9  | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                                                                          | NA                               | <18 U                                                                                        | --           | 3.8                                                                                                                                                                         | --           | NM                                                                                                                                                                                                          | --             | NM            | --      | NM                          | --      | NM                                                 | --      | NM                       | --             | NM          | --      | NM          | --   |
| BETA-BHC                           | 319-85-7   | ID                                                             | 37                                                    | NLV                                                                             | 5.90E+06                                                | 5,400                                       | 150                                                       | 7.40E+06                                                    | 25,000                                         | NA                                                                          | NA                               | <18 U                                                                                        | --           | <1.9 U                                                                                                                                                                      | --           | NM                                                                                                                                                                                                          | --             | NM            | --      | NM                          | --      | NM                                                 | --      | NM                       | --             | NM          | --      | NM          | --   |
| ENDOSULFAN I                       | 959-98-8   | NLL                                                            | NLL                                                   | ID                                                                              | ID                                                      | 1.4E+06 (J)                                 | NLL                                                       | ID                                                          | 4.40E+06 (J)                                   | NA                                                                          | NA                               | <18 U                                                                                        | --           | 3.9                                                                                                                                                                         | --           | NM                                                                                                                                                                                                          | --             | NM            | --      | NM                          | --      | NM                                                 | --      | NM                       | --             | NM          | --      | NM          | --   |
| ENDRIN KETONE                      | 53494-70-5 | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                                                                          | NA                               | <35 U                                                                                        | --           | 25                                                                                                                                                                          | --           | NM                                                                                                                                                                                                          | --             | NM            | --      | NM                          | --      | NM                                                 | --      | NM                       | --             | NM          | --      | NM          | --   |
| GAMMA-CHLORDANE                    | 5103-74-2  | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                                                                          | NA                               | <18 U                                                                                        | --           | <1.9 U                                                                                                                                                                      | --           | NM                                                                                                                                                                                                          | --             | NM            | --      | NM                          | --      | NM                                                 | --      | NM                       | --             | NM          | --      | NM          | --   |
| HEPTACHLOR                         | 76-44-8    | NLL                                                            | NLL                                                   | 3.50E+05                                                                        | 2.40E+06                                                | 5,600                                       | NLL                                                       | 3.00E+06                                                    | 23,000                                         | NA                                                                          | NA                               | <18 U                                                                                        | --           | <1.9 U                                                                                                                                                                      | --           | NM                                                                                                                                                                                                          | --             | NM            | --      | NM                          | --      | NM                                                 | --      | NM                       | --             | NM          | --      | NM          | --   |
| Other                              |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                                                                             |                                  |                                                                                              |              |                                                                                                                                                                             |              |                                                                                                                                                                                                             |                |               |         |                             |         |                                                    |         |                          |                |             |         |             |      |
| CHLORIDE (mg/kg)                   | --         | 94 (X)                                                         | 5,000                                                 | NLV                                                                             | ID                                                      | 500 (F)                                     | 5,000                                                     | ID                                                          | 500 (F)                                        | NA                                                                          | NA                               | NM                                                                                           | --           | NM                                                                                                                                                                          | --           | NM                                                                                                                                                                                                          | --             | NM            | --      | 21                          | --      | NM                                                 | --      | NM                       | --             | NM          | --      | NM          | --   |
| PERCENT MOISTURE (%)               | --         | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                                                                          | NA                               | NM                                                                                           | --           | NM                                                                                                                                                                          | --           | NM                                                                                                                                                                                                          | --             | NM            | --      | NM                          | --      | NM                                                 | --      | NM                       | --             | NM          | --      | NM          | --   |
| HYDROCARBONS, TOTAL (mg/kg)        | --         | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                                                                          | NA                               | NM                                                                                           | --           | NM                                                                                                                                                                          | --           | NM                                                                                                                                                                                                          | --             | NM            | --      | NM                          | --      | NM                                                 | --      | NM                       | --             | NM          | --      | NM          | --   |

Note: Analytical and Criteria Footnotes are included on the last page of the table.



TABLE 8-1  
Summary of Soil Analytical Results  
Area F  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Soil Table Footnotes:

- EGLE Part 201 residential and non-residential generic cleanup criteria and screening levels criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Release Date: December 30, 2013. Updated June 2018.

- Only detected analytes are listed - Gray rows indicate requested analyses. If no analytes are listed below a gray row then all analytes of that group were either not analyzed or not detected.

- **Bold** values are concentrations detected above the laboratory reporting limit.

- **Bold/Shaded** cells indicate analyte concentration exceeded applicable criteria. EGLE Part 201 criteria exceeded is indicated by the footnote in [brackets] following the result value and defined below:

|                                                                                |                                                                                    |
|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| [2] - Groundwater Surface Water Interface Protection Criteria                  | [11] - Nonresidential Drinking Water Protection Criteria                           |
| [3] - Soil Saturation Concentration Screening Levels                           | [12] - Nonresidential Soil Volatilization to Indoor Air Inhalation Criteria (VIAC) |
| [4] - Residential Drinking Water Protection Criteria                           | [13] - Nonresidential Infinite Source Volatile Soil Inhalation Criteria (VSIC)     |
| [5] - Residential Soil Volatilization to Indoor Air Inhalation Criteria (VIAC) | [14] - Nonresidential Finite VSIC for 5 Meter Source Thickness                     |
| [6] - Residential Infinite Source Volatile Soil Inhalation Criteria (VSIC)     | [15] - Nonresidential Finite VSIC for 2 Meter Source Thickness                     |
| [7] - Residential Finite VSIC for 5 Meter Source Thickness                     | [16] - Nonresidential Particulate Soil Inhalation Criteria                         |
| [8] - Residential Finite VSIC for 2 Meter Source Thickness                     | [17] - Nonresidential Direct Contact Criteria                                      |
| [9] - Residential Particulate Soil Inhalation Criteria                         | [18] - Soil Residential MSSL                                                       |
| [10] - Residential Direct Contact Criteria                                     | [19] - Soil Nonresidential MSSL                                                    |

Evaluation based on EGLE Criteria at time of Project completion.

Samples described in this evaluation may actually refer to stamp sands or to other mining waste from the historic mining and reclamation processes conducted in the area.

|                                  |                                                                                   |
|----------------------------------|-----------------------------------------------------------------------------------|
| -- = No Exceedances              | PCBs = Polychlorinated biphenyls                                                  |
| NM = Not Measured                | VOC = Volatile organic compound                                                   |
| ND = Not Detected                | SVOC = Semi-volatile organic compound                                             |
| bgs = Below ground surface       | MSSL = Media-Specific Volatilization to Indoor Air Interim Action Screening Level |
| ft = Feet                        | ug/kg = Micrograms per kilogram                                                   |
| in = Inches                      | % = Percentage                                                                    |
| mg/kg = Milligrams per kilogram. |                                                                                   |

Criteria Footnotes:

ID = Insufficient data to develop criterion.

NA = A criterion or value is not available

NLL = Hazardous substance is not likely to leach under most soil conditions.

(B) = Background, as defined in R 299.1(b), may be substituted if higher than the calculated cleanup criterion. Background levels may be less than criteria for some inorganic compounds.

(BB) = The state drinking water standard for asbestos (fibers greater than 10 micrometers in length) is in units of a million fibers per liter of water (MFL). Soil concentrations of asbestos are determined by polarized light microscop.

(C) = The criterion developed under R 299.20 to R 299.26 exceeds the chemical- specific soil saturation screening level (Csat). The person proposing or implementing response activity shall document whether additional response activity is required to control free-phase liquids or NAPL to protect against risks associated with free-phase liquids by using methods appropriate for the free-phase liquids present. Development of a site-specific Csat or methods presented in R 299.22, R 299.24(5), and R 299.26(8) may be conducted for the relevant exposure pathways.

(D) = Calculated criterion exceeds 100 percent, hence it is reduced to 100 percent or 1.0E+9 parts per billion (ppb).

(DD) = Hazardous substance causes developmental effects. Residential direct contact criteria are protective of both prenatal and postnatal exposure. Nonresidential direct contact criteria are protective for a pregnant adult receptor.

(F) = Criterion is based on adverse impacts to plant life and phytotoxicity.

(G) = Groundwater surface water interface (GSI) criterion depends on the pH or water hardness, or both, of the receiving surface water. The final chronic value (FCV) for the protection of aquatic life shall be calculated based on the pH or hardness of the receiving surface water. Where water hardness exceeds 400 mg Ca/L, use 400 mg CaCO<sub>3</sub>/L for the FCV calculation. The FCV formula provides values in units of ug/L or ppb.

The generic GSI criterion is the lesser of the calculated FCV, the wildlife value (WV), and the surface water human non-drinking water value (HNDV). The soil GSI protection criteria for these hazardous substances are the greater of the 20 times the GSI criterion or the GSI soil-water partition values using the GSI criteria developed with the procedure described in this footnote. A spreadsheet that may be used to calculate GSI and GSI protection criteria for (G)-footnoted hazardous substances is available on the Department of Environment, Great Lakes, and Energy (EGLE) internet web site. A hardness value of 47.5 CaCO<sub>3</sub>L and pH of 7, derived from the Michigan Department of Environmental Quality Draft Site Inspection Report for Lake Linden Operations dated 3/29/13, was used in the footnote G calculation spreadsheet.

(H) = Valence-specific chromium data (Cr III and Cr VI) shall be compared to the corresponding valence-specific cleanup criteria. If both Cr III and Cr VI are present in groundwater, the total concentration of both cannot exceed the drinking water criterion of 100 ug/L. If analytical data are provided for total chromium only, they shall be compared to the cleanup criteria for Cr VI. Cr III soil cleanup criterion for protection of drinking water can only be used at sites where groundwater is prevented from being used as a public water supply, currently and in the future, through an approved land or resource use restriction.

(I) = Hazardous substance may exhibit the characteristic of ignitability as defined in 40 C.F.R. §261.21 (revised as of July 1, 2001), which is adopted by reference in these rules and is available for inspection at the EGLE, 525 West Allegan Street, Lansing, Michigan. Copies of the regulation may be purchased, at a cost as of the time of adoption of these rules of \$45, from the Superintendent of documents, Government Printing Office, Washington, DC 20401 (stock number 869-044-00155-1), or from the EGLE, Remediation and Redevelopment Division (RRD), 525 West Allegan Street, Lansing, Michigan 48933, at cost.

(J) = Hazardous substance may be present in several isomer forms. Isomer-specific concentrations shall be added together for comparison to criteria.

(M) = Calculated criterion is below the analytical target detection limit, therefore, the criterion defaults to the target detection limit.

(P) = Amenable cyanide methods or method OIA-1677 shall be used to quantify cyanide concentrations for compliance with all groundwater criteria. Total cyanide methods or method OIA-1677 shall be used to quantify cyanide concentrations for compliance with soil criteria. Nonresidential direct contact criteria may not be protective of the potential for release of hydrogen cyanide gas. Additional land or resource use restrictions may be necessary to protect for the acute inhalation concerns associated with hydrogen cyanide gas.

(Q) = Criteria for carcinogenic polycyclic aromatic hydrocarbons were developed using relative potential potencies to benzo(a)pyrene.

(R) = Hazardous substance may exhibit the characteristic of reactivity as defined in 40 C.F.R. §261.23 (revised as of July 1, 2001), which is adopted by reference in these rules and is available for inspection at the EGLE, 525 West Allegan Street, Lansing, Michigan. Copies of the regulation may be purchased, at a cost as of the time of adoption of these rules of \$45, from the Superintendent of Documents, Government Printing Office, Washington, DC 20401 (stock number 869-044-00155-1), or from the EGLE, RRD, 525 West Allegan Street, Lansing, Michigan 48933, at cost.

(T) = Refer to the federal Toxic Substances Control Act (TSCA), 40 C.F.R. §761, Subpart D and 40 C.F.R. §761, Subpart G, to determine the applicability of TSCA cleanup standards. Subpart D and Subpart G of 40 C.F.R. §761 (July 1, 2001) are adopted by reference in these rules and are available for inspection at the EGLE, 525 West Allegan Street, Lansing, Michigan. Copies of the regulations may be purchased, at a cost as of the time of adoption of these rules of \$55, from the Superintendent of Documents, Government Printing Office, Washington, DC 20401, or from the EGLE, RRD, 525 West Allegan Street, Lansing, Michigan 48933, at cost. Alternatives to compliance with the TSCA standards listed below are possible under 40 C.F.R. §761 Subpart D. New releases may be subject to the standards identified in 40 C.F.R. §761, Subpart G. Use Part 201 soil direct contact cleanup criteria in the published table if TSCA standards are not applicable.

(X) = The GSI criterion shown in the generic cleanup criteria tables is not protective for surface water that is used as a drinking water source. (See R 299.49 Footnotes for generic cleanup criteria tables for additional information.)

(Z) = Mercury is typically measured as total mercury. The generic cleanup criteria, however, are based on data for different species of mercury. Specifically, data for elemental mercury, chemical abstract service (CAS) number 7439976, serve as the basis for the soil volatilization to indoor air criteria, groundwater volatilization to indoor air, and soil inhalation criteria. Data for methyl mercury, CAS number 22967926, serve as the basis for the GSI criterion; and data for mercuric chloride, CAS number 7487947, serve as the basis for the drinking water, groundwater contact, soil direct contact, and the groundwater protection criteria. Comparison to criteria shall be based on species-specific analytical data only if sufficient facility characterization has been conducted to rule out the presence of other species of mercury.

MSSL Footnotes:

J = Hazardous substance may be present in several isomer forms. Isomer-specific concentrations must be added together for comparison to screening level.

JT = Hazardous substance may be present in several isomer forms. Screening levels may be used for the individual isomer provided that it is the sole isomer detected; however, when multiple isomers are detected in a medium, the isomer-specific concentrations must be added together and compared to the most restrictive screening level of the detected isomers.

M = The screening level may be below target detection limits (TDL).

Laboratory Footnotes:

J = The result is an estimated quantity.

U = Analyte analyzed for but not detected above the reported sample reporting limit.

UU = Analyte analyzed for but not detected above the reported sample reporting limit and is an estimated quantity.

**TABLE 8-1**  
**Summary of Soil Analytical Results**  
**Area F**  
**Quincy Mining Company Portage Operations Area**  
**Abandoned Mining Wastes - Torch Lake Non-Superfund Site**

|                                                                                                         | Part 201 Generic Cleanup Criteria Evaluated                                        | Exceedance |
|---------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------|
| <b>EGLE Part 201 Generic Cleanup Criteria<br/>(June 2018)</b>                                           | [2] - Groundwater Surface Water Interface Protection Criteria                      | YES        |
|                                                                                                         | [3] - Soil Saturation Concentration Screening Levels                               | NO         |
|                                                                                                         | [4] - Residential Drinking Water Protection Criteria                               | YES        |
|                                                                                                         | [5] - Residential Soil Volatilization to Indoor Air Inhalation Criteria (VIAC)     | NO         |
|                                                                                                         | [6] - Residential Infinite Source Volatile Soil Inhalation Criteria (VSIC)         | NO         |
|                                                                                                         | [7] - Residential Finite VSIC for 5 Meter Source Thickness                         | NO         |
|                                                                                                         | [8] - Residential Finite VSIC for 2 Meter Source Thickness                         | NO         |
|                                                                                                         | [9] - Residential Particulate Soil Inhalation Criteria                             | NO         |
|                                                                                                         | [10] - Residential Direct Contact Criteria                                         | YES        |
|                                                                                                         | [11] - Nonresidential Drinking Water Protection Criteria                           | YES        |
|                                                                                                         | [12] - Nonresidential Soil Volatilization to Indoor Air Inhalation Criteria (VIAC) | NO         |
|                                                                                                         | [13] - Nonresidential Infinite Source Volatile Soil Inhalation Criteria (VSIC)     | NO         |
|                                                                                                         | [14] - Nonresidential Finite VSIC for 5 Meter Source Thickness                     | NO         |
|                                                                                                         | [15] - Nonresidential Finite VSIC for 2 Meter Source Thickness                     | NO         |
|                                                                                                         | [16] - Nonresidential Particulate Soil Inhalation Criteria                         | NO         |
|                                                                                                         | [17] - Nonresidential Direct Contact Criteria                                      | YES        |
| <b>Media-Specific Volatilization to Indoor Air Interim<br/>Action Screening Levels<br/>(March 2021)</b> | [18] - Soil Residential Media-Specific Screening Level (MSSL)                      | YES        |
|                                                                                                         | [19] - Soil Nonresidential MSSL                                                    | YES        |

TABLE 8-2  
Summary of Groundwater Analytical Results  
Area F  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code                      |            | EGLE Part 201 Generic Cleanup Criteria           |                                                     |                                                              |                                                                                                |                                                                                                   |                         | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                                         |                                            |                                               |                                               |                                                             | Area F           |         |
|------------------------------------|------------|--------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------|-----------------------------------------------|-----------------------------------------------|-------------------------------------------------------------|------------------|---------|
| Station Name                       | CAS Number | [1]<br>Residential<br>Drinking Water<br>Criteria | [2]<br>Nonresidential<br>Drinking Water<br>Criteria | [3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [4]<br>Residential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [5]<br>Nonresidential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [6]<br>Water Solubility | [8]<br>Shallow<br>Groundwater<br>Residential<br>MSSL                        | [9]<br>Shallow<br>Groundwater<br>Nonresidential<br>MSSL | [10]<br>Groundwater<br>Residential<br>MSSL | [11]<br>Groundwater<br>Residential TS<br>MSSL | [12]<br>Groundwater<br>Nonresidential<br>MSSL | [13]<br>Groundwater<br>Nonresidential<br>MSSL <sub>12</sub> | QMCP-GW64        |         |
| Field Sample ID                    |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | QMCP-GW 64 5-9ft |         |
| Sample Date                        |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 9/7/2018         |         |
| Sample Interval (bgs)              |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 5 - 9 ft         |         |
|                                    |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | Result           | Exceeds |
| Inorganics - Metals (ug/l)         |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |                  |         |
| ARSENIC                            | 7440-38-2  | 10 (A)                                           | 10 (A)                                              | 10                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 1.8              | --      |
| BARIUM                             | 7440-39-3  | 2,000 (A,B)                                      | 2,000 (A,B)                                         | 200 (B,G)                                                    | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM               | --      |
| CADMIUM                            | 7440-43-9  | 5.0 (A,B)                                        | 5.0 (A,B)                                           | 1.3 (B,G,X)                                                  | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <0.2 U           | --      |
| CALCIUM                            | 7440-70-2  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM               | --      |
| CHROMIUM                           | 7440-47-3  | 100 (A,B,H)                                      | 100 (A,B,H)                                         | 40 (B,G,H,X)                                                 | NA                                                                                             | NLV                                                                                               | NLV                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 13               | --      |
| COPPER                             | 7440-50-8  | 4.0 (B,E)                                        | 4.0 (B,E)                                           | 14 (B,G)                                                     | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 4,900            | [1,2,3] |
| LEAD                               | 7439-92-1  | 4.0 (B,L)                                        | 4.0 (B,L)                                           | 14 (B,G,X)                                                   | NVL                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 8.9              | [1,2]   |
| MAGNESIUM                          | 7439-95-4  | 400,000 (B)                                      | 1,100,000 (B)                                       | NA                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM               | --      |
| MANGANESE                          | 7439-96-5  | 50 (B,E)                                         | 50 (B,E)                                            | 1,000 (B,G,X)                                                | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 1,400            | [1,2,3] |
| MERCURY                            | 7439-97-6  | 2.0 (A,B,Z)                                      | 2.0 (A,B,Z)                                         | 0.0013 (B,Z)                                                 | 56 (B,S,Z)                                                                                     | 56 (B,S,Z)                                                                                        | 56 (B,Z)                | 0.088                                                                       | 0.14                                                    | 1.4                                        | 4.3                                           | 4.3                                           | 8.5                                                         | 1                | [3,8,9] |
| POTASSIUM                          | 7440-09-7  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM               | --      |
| SELENIUM                           | 7782-49-2  | 50 (A,B)                                         | 50 (A,B)                                            | 5 (B)                                                        | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM               | --      |
| SILVER                             | 7440-22-4  | 34 (B)                                           | 98 (B)                                              | 0.2 (B,M)                                                    | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 12               | [3]     |
| SODIUM                             | 7440-23-5  | 230,000 (HH)                                     | 350,000                                             | NA                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM               | --      |
| STRONTIUM                          | 7440-24-6  | 4,600 (B)                                        | 13,000 (B)                                          | 21,000 (B)                                                   | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM               | --      |
| ZINC                               | 7440-66-6  | 2,400 (B)                                        | 5,000 (B,E)                                         | 63 (B,G)                                                     | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 58               | --      |
| Organics - PCBs as Aroclors (ug/l) |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |                  |         |
| TOTAL PCBs                         | 1336-36-6  | 0.5 (A,J,T)                                      | 0.5 (A,J,T)                                         | 0.2 (J,M,T)                                                  | 45 (J,S,T)                                                                                     | 45 (J,S,T)                                                                                        | 44.7 (J,T)              | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | ND               | --      |
| Organics - SVOCs (ug/l)            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |                  |         |
| 2-METHYLNAPHTHALENE (SVOC)         | 91-57-6S   | 260                                              | 750                                                 | 19                                                           | 25,000 (S)                                                                                     | 25,000 (S)                                                                                        | 24,600                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5.0 U           | --      |
| ACENAPHTHENE                       | 83-32-9    | 1,300                                            | 3,800                                               | 38                                                           | 4,200 (S)                                                                                      | 4,200 (S)                                                                                         | 4,240                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1.0 U           | --      |
| ACENAPHTHYLENE                     | 208-96-8   | 52                                               | 150                                                 | ID                                                           | 3,900 (S)                                                                                      | 3,900 (S)                                                                                         | 3,930                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1.0 U           | --      |
| ANTHRACENE                         | 120-12-7   | 43 (S)                                           | 43 (S)                                              | ID                                                           | 43 (S)                                                                                         | 43 (S)                                                                                            | 43.4                    | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1.0 U           | --      |
| BENZO(A)ANTHRACENE                 | 56-55-3    | 2.1 (Q)                                          | 8.5 (Q)                                             | ID                                                           | NLV                                                                                            | NLV                                                                                               | 9.4 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1.0 U           | --      |
| BENZO(A)PYRENE                     | 50-32-8    | 5.0 (A,Q)                                        | 5.0 (A,Q)                                           | ID                                                           | NLV                                                                                            | NLV                                                                                               | 1.62 (Q)                | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1.0 U           | --      |
| BENZO(B)FLUORANTHENE               | 205-99-2   | 1.5 (Q,S,AA)                                     | 1.5 (Q,S,AA)                                        | ID                                                           | ID                                                                                             | ID                                                                                                | 1.5 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1.0 U           | --      |
| BENZO(G,H,I)PERYLENE               | 191-24-2   | 1.0 (M)                                          | 1.0 (M)                                             | ID                                                           | NLV                                                                                            | NLV                                                                                               | 0.26                    | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1.0 U           | --      |
| BENZO(K)FLUORANTHENE               | 207-08-9   | 1.0 (M,Q)                                        | 1.0 (M,Q)                                           | NA                                                           | NLV                                                                                            | NLV                                                                                               | 0.8 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1.0 U           | --      |
| CHRYSENE                           | 218-01-9   | 1.6 (Q,S)                                        | 1.6 (Q,S)                                           | ID                                                           | ID                                                                                             | ID                                                                                                | 1.6 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1.0 U           | --      |
| FLUORANTHENE                       | 206-44-0   | 210 (S)                                          | 210 (S)                                             | 1.6                                                          | 210 (S)                                                                                        | 210 (S)                                                                                           | 206                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1.0 U           | --      |
| FLUORENE                           | 86-73-7    | 880                                              | 2,000 (S)                                           | 12                                                           | 2,000 (S)                                                                                      | 2,000 (S)                                                                                         | 1,980                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1.0 U           | --      |
| INDENO(1,2,3-CD)PYRENE             | 193-39-5   | 2.0 (M,Q)                                        | 2.0 (M,Q)                                           | ID                                                           | NLV                                                                                            | NLV                                                                                               | 0.022 (Q)               | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <2.0 U           | --      |
| NAPHTHALENE (SVOC)                 | 91-20-3S   | 520                                              | 1,500                                               | 11                                                           | 31,000 (S)                                                                                     | 31,000 (S)                                                                                        | 31,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1.0 U           | --      |
| PENTACHLOROPHENOL                  | 87-86-5    | 1.0 (A)                                          | 1.0 (A)                                             | 1.8 (G,X)                                                    | NLV                                                                                            | NLV                                                                                               | 1.85E+06                | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM               | --      |
| PHENANTHRENE                       | 85-01-8    | 52                                               | 150                                                 | 2.0 (M)                                                      | 1,000 (S)                                                                                      | 1,000 (S)                                                                                         | 1,000                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1.0 U           | --      |
| PYRENE                             | 129-00-0   | 140 (S)                                          | 140 (S)                                             | ID                                                           | 140 (S)                                                                                        | 140 (S)                                                                                           | 135                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1.0 U           | --      |

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 8-2  
Summary of Groundwater Analytical Results  
Area F  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code              |            | EGLE Part 201 Generic Cleanup Criteria           |                                                     |                                                              |                                                                                                |                                                                                                   |                         | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                                         |                                            |                                               |                                               |                                                             | Area F           |         |
|----------------------------|------------|--------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------|-----------------------------------------------|-----------------------------------------------|-------------------------------------------------------------|------------------|---------|
| Station Name               | CAS Number | [1]<br>Residential<br>Drinking Water<br>Criteria | [2]<br>Nonresidential<br>Drinking Water<br>Criteria | [3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [4]<br>Residential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [5]<br>Nonresidential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [6]<br>Water Solubility | [8]<br>Shallow<br>Groundwater<br>Residential<br>MSSL                        | [9]<br>Shallow<br>Groundwater<br>Nonresidential<br>MSSL | [10]<br>Groundwater<br>Residential<br>MSSL | [11]<br>Groundwater<br>Residential TS<br>MSSL | [12]<br>Groundwater<br>Nonresidential<br>MSSL | [13]<br>Groundwater<br>Nonresidential<br>MSSL <sub>12</sub> | QMCP-GW64        |         |
| Field Sample ID            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | QMCP-GW 64 5-9ft |         |
| Sample Date                |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 9/7/2018         |         |
| Sample Interval (bgs)      |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 5 - 9 ft         |         |
|                            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | Result           | Exceeds |
| Organics - VOCs (ug/l)     |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |                  |         |
| 1,1,1-TRICHLOROETHANE      | 71-55-6    | 200 (A)                                          | 200 (A)                                             | 89                                                           | 660,000                                                                                        | 1,300,000 (S)                                                                                     | 1,330,000               | 180                                                                         | 500                                                     | 8,600                                      | 8,600                                         | 24,000                                        | 24,000                                                      | <1.0 U           | --      |
| 1,2,3-TRIMETHYLBENZENE     | 526-73-8   | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | 43 (JT)                                                                     | 67 (JT)                                                 | 800 (JT)                                   | 2,400 (JT)                                    | 2,300 (JT)                                    | 4,700 (JT)                                                  | <1.0 U           | --      |
| 1,2,4-TRIMETHYLBENZENE     | 95-63-6    | 63 (E,I)                                         | 63 (E,I)                                            | 17 (I)                                                       | 56,000 (I,S)                                                                                   | 56,000 (I,S)                                                                                      | 55,890 (I)              | 25 (JT)                                                                     | 44 (JT)                                                 | 440 (JT)                                   | 1,300 (JT)                                    | 1,300 (JT)                                    | 2,600 (JT)                                                  | <1.0 U           | --      |
| 1,3,5-TRIMETHYLBENZENE     | 108-67-8   | 72 (E,I)                                         | 72 (E,I)                                            | 45 (I)                                                       | 61,000 (I,S)                                                                                   | 61,000 (I,S)                                                                                      | 61,150 (I)              | 18 (JT)                                                                     | 30 (JT)                                                 | 310 (JT)                                   | 940 (JT)                                      | 920 (JT)                                      | 1,800 (JT)                                                  | <1.0 U           | --      |
| 2-METHYLNAPHTHALENE (VOC)  | 91-57-6V   | 260                                              | 750                                                 | 19                                                           | 25,000 (S)                                                                                     | 25,000 (S)                                                                                        | 24,600                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5.0 U           | --      |
| ACETONE                    | 67-64-1    | 730 (I)                                          | 2100 (I)                                            | 1700 (I)                                                     | 1.0E+9 (D,I,S)                                                                                 | 1.0E+9 (D,I,S)                                                                                    | 1.0E+9 (I)              | 50,000                                                                      | 62,000                                                  | 1.20E+07                                   | 1.20E+07                                      | 2.50E+07                                      | 2.50E+07                                                    | <20 U            | --      |
| BENZENE                    | 71-43-2    | 5.0 (A,I)                                        | 5.0 (A,I)                                           | 12 (I,X)                                                     | 5,600 (I)                                                                                      | 35,000 (I)                                                                                        | 1,750,000 (I)           | 1                                                                           | 2.7                                                     | 14                                         | 82                                            | 66                                            | 130                                                         | <1.0 U           | --      |
| CYCLOHEXANE                | 110-82-7   | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5.0 U           | --      |
| ETHYLBENZENE               | 100-41-4   | 74 (E,I)                                         | 74 (E,I)                                            | 18 (I)                                                       | 110,000 (I)                                                                                    | 170,000 (I,S)                                                                                     | 169,000 (I)             | 2.8                                                                         | 7.6                                                     | 45                                         | 450                                           | 210                                           | 420                                                         | <1.0 U           | --      |
| HEXANE                     | 110-54-3   | 3,000                                            | 8,600                                               | NA                                                           | 12,000 (S)                                                                                     | 12,000 (S)                                                                                        | 12,000                  | 29                                                                          | 85                                                      | 29 (GW)                                    | 33                                            | 85 (GW)                                       | 170 (GW)                                                    | <1.0 U           | --      |
| ISOPROPYLBENZENE           | 98-82-8    | 800                                              | 2,300                                               | 28                                                           | 56,000 (S)                                                                                     | 56,000 (S)                                                                                        | 56,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1.0 U           | --      |
| M,P-XYLENE                 | 1330-20-7  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <2.0 U           | --      |
| NAPHTHALENE (VOC)          | 91-20-3V   | 520                                              | 1,500                                               | 11                                                           | 31,000 (S)                                                                                     | 31,000 (S)                                                                                        | 31,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5.0 U           | --      |
| N-PROPYLBENZENE            | 103-65-1   | 80 (I)                                           | 230 (I)                                             | ID                                                           | ID                                                                                             | ID                                                                                                | NA                      | 43                                                                          | 83                                                      | 4100                                       | 12000                                         | 8100                                          | 8100                                                        | <1.0 U           | --      |
| O-XYLENE                   | 95-47-6    | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1.0 U           | --      |
| TETRACHLOROETHYLENE        | 127-18-4   | 5.0 (A)                                          | 5.0 (A)                                             | 11 (X)                                                       | 25,000                                                                                         | 170,000                                                                                           | 200,000                 | 1.5                                                                         | 3                                                       | 96                                         | 96                                            | 190                                           | 380                                                         | <1.0 U           | --      |
| TOLUENE                    | 108-88-3   | 790 (E,I)                                        | 790 (E,I)                                           | 270 (I)                                                      | 530,000 (I,S)                                                                                  | 530,000 (I,S)                                                                                     | 526,000 (I)             | 300                                                                         | 570                                                     | 23,000                                     | 33,000                                        | 66,000                                        | 66,000                                                      | <1.0 U           | --      |
| TRICHLOROETHYLENE          | 79-01-6    | 5.0 (A)                                          | 5.0 (A)                                             | 29 (X)                                                       | 2,200                                                                                          | 4,900                                                                                             | 1,100,000               | 0.073 (M)                                                                   | 0.14 (M)                                                | 6.1                                        | 18                                            | 12                                            | 24                                                          | <1.0 U           | --      |
| XYLENE - TOTAL             | 1330-20-7  | 280 (E,I)                                        | 280 (E,I)                                           | 49 (I)                                                       | 190,000 (I,S)                                                                                  | 190,000 (I,S)                                                                                     | 186,000 (I)             | 75 (J)                                                                      | 120 (J)                                                 | 1,200 (J)                                  | 3,600 (J)                                     | 3,500 (J)                                     | 7,100 (J)                                                   | ND               | --      |
| Other                      |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |                  |         |
| CHLORIDE (mg/l)            | 16887-00-6 | 250,000 (E)                                      | 250,000 (E)                                         | 50 (FF)                                                      | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM               | --      |
| NITROGEN (mg/l)            | 7727-37-9  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM               | --      |
| HYDROCARBONS, TOTAL (mg/l) | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM               | --      |
| Water Quality Parameters   |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |                  |         |
| TEMPERATURE (°C)           | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 17.4             | --      |
| CONDUCTIVITY (mS/cm)       | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 0.710            | --      |
| DISSOLVED OXYGEN (%)       | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 5.1              | --      |
| pH                         | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 7.13             | --      |
| TURBIDITY (nTu)            | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM               | --      |

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 8-2  
Summary of Groundwater Analytical Results  
Area F  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Groundwater Table Footnotes:

- EGLE Part 201 residential and non-residential generic cleanup criteria and screening levels criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Release Date: December 30, 2013. Updated December 21, 2020.

- Only detected analytes are listed - Gray rows indicate requested analyses. If no analytes are listed below a gray row then all analytes of that group were either not analyzed or not detected.

- **Bold** values are concentrations detected above the laboratory reporting limit.

- **Bold/Shaded** cells indicate analyte concentration exceeded applicable criteria. EGLE Part 201 criteria exceeded is indicated by the footnote in [brackets] following the result value and defined below:

|                                                                                   |                                                    |
|-----------------------------------------------------------------------------------|----------------------------------------------------|
| [1] - Residential Drinking Water Criteria                                         | [8] Shallow Groundwater Residential MSSL           |
| [2] - Nonresidential Drinking Water Criteria                                      | [9] Shallow Groundwater Nonresidential MSSL        |
| [3] - Groundwater Surface Water Interface Criteria                                | [10] Groundwater Residential MSSL                  |
| [4] - Water Solubility                                                            | [11] Groundwater Residential TS MSSL               |
| [5] - Residential Groundwater Volatilization to Indoor Air Inhalation Criteria    | [12] Groundwater Nonresidential MSSL               |
| [6] - Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria | [13] Groundwater Nonresidential MSSL <sub>12</sub> |
| [7] - Flammability and Explosivity Screening Level                                | [14] Groundwater Nonresidential TS MSSL            |

Evaluation based on EGLE Criteria at time of Project completion.

|                                       |                                                                                                     |
|---------------------------------------|-----------------------------------------------------------------------------------------------------|
| -- = No Exceedances                   | mg/l = Milligrams per liter                                                                         |
| ND = Not Detected                     | °C = Degrees Celsius                                                                                |
| NM = Not Measured                     | mS/cm = MilliSiemens per centimeter                                                                 |
| bgs = Below ground surface            | % = Percentage                                                                                      |
| ft = Feet                             | nTu = Nephelometric Turbidity Unit                                                                  |
| PCBs = Polychlorinated biphenyls      | pH = pH acid-base scale                                                                             |
| SVOC = Semi-volatile organic compound | MSSL = Media-Specific Volatilization to Indoor Air Interim Action Screening Level                   |
| VOC = Volatile organic compound       | TS MSSL = Time Sensitive Media-Specific Volatilization to Indoor Air Interim Action Screening Level |
| ug/l = Micrograms per liter           |                                                                                                     |

Groundwater Table Footnotes:

ID = Insufficient data to develop criterion.

NA = A criterion or value is not available

NLV = Hazardous substance is not likely to volatilize under most conditions.

(A) = Criterion is the state of Michigan drinking water standard established pursuant to Section 5 of 1976 PA 399, MCL 325.1005.

(AA) = Use 10,000 ug/l where groundwater enters a structure through the use of a water well, sump or other device. Use 28,000 ug/l for all other uses.

(B) = Background, as defined in R 299.1(b), may be substituted if higher than the calculated cleanup criterion. Background levels may be less than criteria for some inorganic compounds.

(D) = Calculated criterion exceeds 100 percent, hence it is reduced to 100 percent or 1.0E+9 parts per billion (ppb).

(E) = Criterion is the aesthetic drinking water value, as required by Section 20120a(5) of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA). A notice of aesthetic impact may be employed as an institutional control mechanism if groundwater concentrations exceed the aesthetic drinking water criterion, but do not exceed the applicable health-based drinking water value provided in a table available on the Department of Environment, Great Lakes, and Energy (EGLE) internet web site. (See R 299.49 Footnotes for generic cleanup criteria tables for additional information)

(FF) = The chloride GSI criterion shall be 125 mg/l when the discharge is to surface waters of the state designated as public water supply sources or 50 mg/l when the discharge is to the Great Lakes or connecting waters. Chloride GSI criteria shall not apply for surface waters of the state that are not designated as a public water supply source, however, the total dissolved solids criterion is applicable.

(G) = Groundwater surface water interface (GSI) criterion depends on the pH or water hardness, or both, of the receiving surface water. The final chronic value (FCV) for the protection of aquatic life shall be calculated based on the pH or hardness of the receiving surface water. Where water hardness exceeds 400 mg CaCO<sub>3</sub>/L, use 400 mg CaCO<sub>3</sub>/L for the FCV calculation. The FCV formula provides values in units of ug/L or ppb. The generic GSI criterion is the lesser of the calculated FCV, the wildlife value (WV), and the surface water human non-drinking water value (HNDV). The soil GSI protection criteria for these hazardous substances are the greater of the 20 times the GSI criterion or the GSI soil-water partition values using the GSI criteria developed with the procedure described in this footnote. A spreadsheet that may be used to calculate GSI and GSI protection criteria for (G)-footnoted hazardous substances is available on the Department of Environment, Great Lakes, and Energy (EGLE) internet web site. A hardness value of 47.5 CaCO<sub>3</sub>/L and pH of 7, derived from the Michigan Department of Environmental Quality Draft Site Inspection Report for Lake Linden Operations dated 3/29/13, was used in the footnote G calculation spreadsheet.

(H) = Valence-specific chromium data (Cr III and Cr VI) shall be compared to the corresponding valence-specific cleanup criteria. If both Cr III and Cr VI are present in groundwater, the total concentration of both cannot exceed the drinking water criterion of 100 ug/L. If analytical data are provided for total chromium only, they shall be compared to the cleanup criteria for Cr VI. Cr III soil cleanup criterion for protection of drinking water can only be used at sites where groundwater is prevented from being used as a public water supply, currently and in the future, through an approved land or resource use restriction.

(HH) = The residential criterion for sodium is 230,000 ug/l in accordance with the Sodium Advisory Council recommendation and revised Groundwater Discharge Standards.

(I) = Hazardous substance may exhibit the characteristic of ignitability as defined in 40 C.F.R. §261.21 (revised as of July 1, 2001), which is adopted by reference in these rules and is available for inspection at EGLE, 525 West Allegan Street, Lansing, Michigan. Copies of the regulation may be purchased, at a cost as of the time of adoption of these rules of \$45, from the Superintendent of documents, Government Printing Office, Washington, DC 20401 (stock number 869-044-00155-1), or from the EGLE, Remediation and Redevelopment Division (RRD), 525 West Allegan Street, Lansing, Michigan 48933, at cost.

(J) = Hazardous substance may be present in several isomer forms. Isomer-specific concentrations shall be added together for comparison to criteria.

(L) = Criteria for lead are derived using a biologically based model, as allowed for under Section 20120a(9) of the NREPA, and are not calculated using the algorithms and assumptions specified in pathway-specific rules. The generic residential drinking water criterion of 4 ug/L is linked to the generic residential soil direct contact criterion of 400 mg/kg. A higher concentration in the drinking water, up to the state action level of 15 ug/L, may be allowed as a site-specific remedy and still allow for drinking water use, under Section 20120a(2) and 20120b of the NREPA if soil concentrations are appropriately lower than 400 mg/kg. If a site-specific criterion is approved based on this subdivision, a notice shall be filed on the deed for all property where the groundwater concentrations will exceed 4 ug/L to provide notice of the potential for unacceptable risk if soil or groundwater concentrations increase.

Acceptable combinations of site-specific soil and drinking water concentrations are presented in a table available on the Department of Environment, Great Lakes, and Energy (EGLE) internet web site (See R 299.49 Footnotes for generic cleanup criteria tables for additional information).

(M) = Calculated criterion is below the analytical target detection limit, therefore, the criterion defaults to the target detection limit.

(Q) = Criteria for carcinogenic polycyclic aromatic hydrocarbons were developed using relative potential potencies to benzo(a)pyrene.

(S) = Criterion defaults to the hazardous substance-specific water solubility limit.

(T) = Refer to the federal Toxic Substances Control Act (TSCA), 40 C.F.R. §761, Subpart D and 40 C.F.R. §761, Subpart G, to determine the applicability of TSCA cleanup standards. Subpart D and Subpart G of 40 C.F.R. §761 (July 1, 2001) are adopted by reference in these rules and are available for inspection at the EGLE, 525 West Allegan Street, Lansing, Michigan. Copies of the regulations may be purchased, at a cost as of the time of adoption of these rules of \$55, from the Superintendent of Documents, Government Printing Office, Washington, DC 20401, or from the EGLE, RRD, 525 West Allegan Street, Lansing, Michigan 48933, at cost. Alternatives to compliance with the TSCA standards listed below are possible under 40 C.F.R. §761 Subpart D. New releases may be subject to the standards identified in 40 C.F.R. §761, Subpart G. Use Part 201 soil direct contact cleanup criteria in the published table if TSCA standards are not applicable.

(X) = The GSI criterion shown in the generic cleanup criteria tables is not protective for surface water that is used as a drinking water source. (See R 299.49 Footnotes for generic cleanup criteria tables for additional information.)

(Z) = Mercury is typically measured as total mercury. The generic cleanup criteria, however, are based on data for different species of mercury. Specifically, data for elemental mercury, chemical abstract service (CAS) number 7439976, serve as the basis for the soil volatilization to indoor air criteria, groundwater volatilization to indoor air, and soil inhalation criteria. Data for methyl mercury, CAS number 22967926, serve as the basis for the GSI criterion; and data for mercuric chloride, CAS number 7487947, serve as the basis for the drinking water, groundwater contact, soil direct contact, and the groundwater protection criteria. Comparison to criteria shall be based on species-specific analytical data only if sufficient facility characterization has been conducted to rule out the presence of other species of mercury.

MSSL Footnotes:

GW = The calculated value for a hazardous substance based upon shallow groundwater is considered protective when it is greater than the calculated value for groundwater.

J = Hazardous substance may be present in several isomer forms. Isomer-specific concentrations must be added together for comparison to screening level.

JT = Hazardous substance may be present in several isomer forms. Screening levels may be used for the individual isomer provided that it is the sole isomer detected; however, when multiple isomers are detected in a medium, the isomer-specific concentrations must be added together and compared to the most restrictive screening level of the detected isomers.

Laboratory Footnotes:

U = Analyte analyzed for but not detected above the reported sample reporting limit.

**TABLE 8-2**  
**Summary of Groundwater Analytical Results**  
**Area F**  
**Quincy Mining Company Portage Operations Area**  
**Abandoned Mining Wastes - Torch Lake Non-Superfund Site**

|                                                                                                         | Part 201 Generic Cleanup Criteria Evaluated                                          | Exceedance |
|---------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|------------|
| <b>EGLE Part 201 Generic Cleanup Criteria<br/>(December 2020)</b>                                       | [1] Residential Drinking Water Criteria                                              | YES        |
|                                                                                                         | [2] Nonresidential Drinking Water Criteria                                           | YES        |
|                                                                                                         | [3] Groundwater Surface Water Interface Criteria                                     | YES        |
|                                                                                                         | [4] Residential Groundwater Volatilization to Indoor Air Inhalation Criteria         | NO         |
|                                                                                                         | [5] Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria      | NO         |
|                                                                                                         | [6] Water Solubility                                                                 | NO         |
|                                                                                                         | [7] Flammability and Explosivity Screening                                           | NO         |
| <b>Media-Specific Volatilization to Indoor Air<br/>Interim Action Screening Levels<br/>(March 2021)</b> | [8] Shallow Groundwater Residential Media-Specific Screening Level (MSSL)            | YES        |
|                                                                                                         | [9] Shallow Groundwater Nonresidential MSSL                                          | YES        |
|                                                                                                         | [10] Groundwater Residential MSSL                                                    | NO         |
|                                                                                                         | [11] Groundwater Residential Time Sensitive Media-Specific Screening Level (TS MSSL) | NO         |
|                                                                                                         | [12] Groundwater Nonresidential MSSL                                                 | NO         |
|                                                                                                         | [13] Groundwater Nonresidential MSSL <sub>12</sub>                                   | NO         |
|                                                                                                         | [14] Groundwater Nonresidential TS MSSL <sub>12</sub>                                | NO         |



## 9. DETAILED FINDINGS – AREA H

This Section summarizes the results and the subsequent findings for Area H within QMCP derived from implementation of the SAP. The narrative follows the systematic investigative approach outlined in **Section 3**, while providing specific details about the potential human health and ecological risks associated with the historical mining operations in this subarea of QMCP.

### 9.1 SITE INSPECTION AND INVESTIGATION RESULTS

The implementation of the site inspection and investigation activities provided critical lines of evidence that link the historical documentation and the current environmental conditions in and around the Portage Canal. The following subsections present the findings of the inspection and investigation activities and provide correlation of mining era operations and their potential impacts on the nearshore and offshore environment of the Portage Canal.

#### 9.1.1 Site Inspection

The site inspection at each subarea included the inventory and locating of historical structures and similar surficial artifacts associated with the former industrial operations in the area. Each subarea was also inspected for potential physical and health hazards that were documented, photographed, and located with a GPS unit. The inventoried hazards were then qualitatively assessed for potential human health and environmental risks to determine if analytical sampling was warranted during the targeted inspection phase of the work.

On September 25, 2018, MSG field team personnel performed reconnaissance activities at Area H. In the case where access was not requested based on historic operational and investigative findings, property conditions were evaluated from a neighboring property or public right of way where access was permitted. Access to Area H was not requested based on historic operational and investigative findings.

The property parcel known as the Wuebben Property totaling approximately 10 acres was visually inspected and observations were recorded from the MDNR public trail property. The qualitative assessment of the reconnaissance findings in Area H did not warrant the performance of targeted inspection activities. The following provides a summary of the findings associated with the reconnaissance activities. A copy of the reconnaissance log is provided in **Appendix C, Site Inspections – Reconnaissance Logs, Targeted Inspections & Physical Hazards Inventory**.

##### 9.1.1.1 Reconnaissance

The reconnaissance activities did not identify any potentially abandoned containers or other environmental concerns during the review of Area H. Therefore, the reconnaissance findings did not warrant the performance of limited targeted inspection activities.

#### 9.1.2 Site Investigation

The SI in the QMCP was developed based on a variety of data and information as outlined in **Section 3**. In addition to the historical accounts and documentation, current land use and potential exposure pathways were also taken into consideration when considering potential sampling locations. Due to this, along with findings associated with previous investigations, additional samples were not collected during SI activities in Area H. The following subsections present the outcomes of historic investigative activities completed in Area H by summarizing the laboratory analytical results and characterizing their impacts on the environmental media in which they were detected.

### 9.1.2.1 Historic Investigations

Following a review of available historic Sanborn Maps and other resources, historic land use and/or operations within Area H were unknown.

Inorganic COCs in the study area were generally understood in areas where previous investigations had been completed. Only limited data related to the COCs on the property was available.

A detailed summary of analytical results for the seven historic soil samples collected from Area H is provided in **Table 9-1, Summary of Soil Analytical Results (Area H)**. Historic soil analytical results are depicted on **Figure 9-1, Soil Analytical Results (Area H)**. A detailed summary of historic analytical data for eight groundwater samples is provided in **Table 9-2, Summary of Groundwater Analytical Results (Area H)** and is depicted on **Figure 9-2, Groundwater Analytical Results (Area H)**.

## 9.2 NATURE AND EXTENT OF CONTAMINATION

Utilizing the established regulatory criteria presented in **Section 4** for various land use categories and exposure pathways, the historic laboratory analytical results summarized in the preceding section for Area H were reviewed and compared to EGLE Cleanup Criteria Requirements for Response Activity as applicable for the sampled environmental media.

### 9.2.1 Comprehensive Exposure Assessment

The comparison was completed to determine which ecological and human exposure pathways, risks, and conditions are relevant at Area H. Although not inclusive of relevant pathways where regulatory criteria were not exceeded, the following exposure pathways were determined to be relevant in Area H:

- Risks posed by hazardous substances in soil and the potential for the substances to leach to groundwater that could vent to surface water.

As discussed in **Section 4.2.5**, EGLE drinking water and groundwater/surface water pathway criteria exceedances for metals were excluded from the soil and groundwater evaluation. The rationale for this exclusion is twofold:

- The Project investigation and anticipated response actions are being undertaken pursuant to Part 201 of NREPA, being PA 451 of 1994, as amended. The concentrations of metals in excess of the EGLE drinking water and groundwater/surface water pathway criteria are ubiquitous in the study area and are predominantly the result of the presence of stamp sands. Stamp sands are not defined as a hazardous substance nor are subject to regulation under Part 201 unless the property otherwise contains hazardous substances in excess of concentrations that satisfy the cleanup criteria for unrestricted residential use; and,
- The study area is part of OU 2 for which the EPA ROD remedy called for No Action. The EPA's ROD OU 2 includes groundwater, surface water, submerged tailings and sediments in Torch Lake, Portage Lake, the Portage Canal, and other area water bodies. Note that EPA's No Action determination relies on the following to mitigate the effects of stamp sand to the extent practicable:
  - The reduction of stamp sand loading to surface water bodies expected as a result of the remedial action taken at OU 1 and OU 3.
  - Ongoing natural sedimentation and detoxification.

- Institutional programs and practices controlling potential future exposure to site-affected drinking water which were intended to be administered at the county and state level.
- The long-term monitoring and the five-year review process monitoring requirements of the remedy selected for OU 1 and OU 3 under the 1992 ROD.

Note that metals criteria for other relevant pathways, and cyanide and organic contaminants for all pathways were included in the evaluation.

Furthermore, as discussed in **Section 4.2.5**, EGLE's MSSLs were not included in the exposure pathway assessment due to unknown anticipated future land use and conditions. The MSSLs were considered for screening and delineation purposes only.

#### 9.2.1.1 Soil Exposure Pathway Assessment

Historical soil analytical results from Area H identified COC concentrations in soil that were at or above concentrations that trigger a "Facility" designation as defined in Section 20101(1)(s) of the NREPA. The following tables provide an aggregate summary of the soil sample locations with respect to the total number of samples and how they compare to the applicable EGLE Cleanup Criteria for Response Activity under both Residential and Nonresidential exposure scenarios. The tables are based solely on the total number of samples, inclusive of historical samples, collected from Area H. They list only the number of samples for a specific analytical suite that contained one or more exceedance of a given criterion.

| Soil Analytical Result Summary Table                                 | Cleanup Criteria Requirements for Response Activity – Residential** |                    |                    |                                                |                                                         |                                                       |                                                          |                                          |                                          |                                      |                         |                                                |
|----------------------------------------------------------------------|---------------------------------------------------------------------|--------------------|--------------------|------------------------------------------------|---------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------|------------------------------------------|------------------------------------------|--------------------------------------|-------------------------|------------------------------------------------|
|                                                                      | Analytical Summary                                                  |                    |                    | Groundwater Protection                         |                                                         | Indoor Air                                            | Ambient Air                                              |                                          |                                          |                                      | Contact                 | Csat                                           |
|                                                                      | Total Number of Samples                                             | Detected Analytes* | Total Exceedances* | Residential Drinking Water Protection Criteria | Groundwater Surface Water Interface Protection Criteria | Soil Volatilization to Indoor Air Inhalation Criteria | Infinite Source Volatile Soil Inhalation Criteria (VSIC) | Finite VSIC for 5 Meter Source Thickness | Finite VSIC for 2 Meter Source Thickness | Particulate Soil Inhalation Criteria | Direct Contact Criteria | Soil Saturation Concentration Screening Levels |
| Inorganics                                                           | 5                                                                   | 33                 | 0                  | NA*                                            | NA*                                                     | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Cyanide                                                              | 0                                                                   | 0                  | 0                  | 0                                              | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| VOCs                                                                 | 5                                                                   | 10                 | 2                  | 0                                              | 1                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| SVOCs                                                                | 0                                                                   | 0                  | 0                  | 0                                              | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Asbestos                                                             | 0                                                                   | 0                  | 0                  | 0                                              | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Total PCBs                                                           | 0                                                                   | 0                  | 0                  | 0                                              | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Pesticides                                                           | 0                                                                   | 0                  | 0                  | 0                                              | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| COCs exceeding applicable regulatory criteria in one or more samples |                                                                     |                    |                    | 1,2,4-TRIMETHYLBENZENE, XYLENE - TOTAL         |                                                         |                                                       |                                                          |                                          |                                          |                                      |                         |                                                |

NA\* = The EGLE drinking water and groundwater/surface water interface pathway criteria exceedances for metals are excluded from the groundwater evaluation as explained in Section 4.2.5.

\*Denotes total number of specific instances of an analyte being detected or exceeding criteria, can be multiple within one sample location.

\*\*Denotes total number of samples exceeding criteria, cannot be multiple within one sample location.

Total exceedance column does not include MSSLs or non-applicable criteria (DWPC and GSIPC for metals).

| Soil Analytical Result Summary Table                                 | Cleanup Criteria Requirements for Response Activity – Nonresidential** |                    |                    |                                                   |                                                         |                                                       |                                                          |                                          |                                          |                                      |                         |                                                |
|----------------------------------------------------------------------|------------------------------------------------------------------------|--------------------|--------------------|---------------------------------------------------|---------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------|------------------------------------------|------------------------------------------|--------------------------------------|-------------------------|------------------------------------------------|
|                                                                      | Analytical Summary                                                     |                    |                    | Groundwater Protection                            |                                                         | Indoor Air                                            | Ambient Air                                              |                                          |                                          |                                      | Contact                 | Csat                                           |
|                                                                      | Total Number of Samples                                                | Detected Analytes* | Total Exceedances* | Nonresidential Drinking Water Protection Criteria | Groundwater Surface Water Interface Protection Criteria | Soil Volatilization to Indoor Air Inhalation Criteria | Infinite Source Volatile Soil Inhalation Criteria (VSIC) | Finite VSIC for 5 Meter Source Thickness | Finite VSIC for 2 Meter Source Thickness | Particulate Soil Inhalation Criteria | Direct Contact Criteria | Soil Saturation Concentration Screening Levels |
| Inorganics                                                           | 5                                                                      | 33                 | 0                  | NA*                                               | NA*                                                     | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Cyanide                                                              | 0                                                                      | 0                  | 0                  | 0                                                 | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| VOCs                                                                 | 5                                                                      | 10                 | 2                  | 0                                                 | 1                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| SVOCs                                                                | 0                                                                      | 0                  | 0                  | 0                                                 | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Asbestos                                                             | 0                                                                      | 0                  | 0                  | 0                                                 | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Total PCBs                                                           | 0                                                                      | 0                  | 0                  | 0                                                 | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Pesticides                                                           | 0                                                                      | 0                  | 0                  | 0                                                 | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| COCs exceeding applicable regulatory criteria in one or more samples |                                                                        |                    |                    | 1,2,4-TRIMETHYLBENZENE, XYLENE - TOTAL            |                                                         |                                                       |                                                          |                                          |                                          |                                      |                         |                                                |

NA\* = The EGLE drinking water and groundwater/surface water interface pathway criteria exceedances for metals are excluded from the groundwater evaluation as explained in Section 4.2.5.

\*Denotes total number of specific instances of an analyte being detected or exceeding criteria, can be multiple within one sample location.

\*\*Denotes total number of samples exceeding criteria, cannot be multiple within one sample location.

Total exceedance column does not include MSSLs or non-applicable criteria (DWPC and GSIPC for metals).

#### 9.2.1.2 Groundwater Exposure Pathway Assessment

Groundwater analytical results from Area H did not include COC concentrations in groundwater that were at or above concentrations that trigger a “Facility” designation as defined in Section 20101(1)(s) of the NREPA. Similar to the preceding soil tables, the following table provides a summary of the aforementioned sample locations with respect to the total number of samples and how they compare to the applicable EGLE Cleanup Criteria for Response Activity under both Residential and Nonresidential exposure scenarios.

| Groundwater Analytical Result Summary Table                          | Analytical Summary      |                                    |                    | Cleanup Criteria Requirements for Response Activity – Residential and Nonresidential** |                                        |                                              |                                                                          |                                                                             |                  |                                               |
|----------------------------------------------------------------------|-------------------------|------------------------------------|--------------------|----------------------------------------------------------------------------------------|----------------------------------------|----------------------------------------------|--------------------------------------------------------------------------|-----------------------------------------------------------------------------|------------------|-----------------------------------------------|
|                                                                      | Total Number of Samples | Total Number of Detected Analytes* | Total Exceedances* | Residential Drinking Water Criteria                                                    | Nonresidential Drinking Water Criteria | Groundwater Surface Water Interface Criteria | Residential Groundwater Volatilization to Indoor Air Inhalation Criteria | Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria | Water Solubility | Flammability and Explosivity Screening Levels |
| Inorganics                                                           | 8                       | 9                                  | 0                  | NA*                                                                                    | NA*                                    | NA*                                          | 0                                                                        | 0                                                                           | 0                | 0                                             |
| Cyanide                                                              | 0                       | 0                                  | 0                  | 0                                                                                      | 0                                      | 0                                            | 0                                                                        | 0                                                                           | 0                | 0                                             |
| VOCs                                                                 | 8                       | 1                                  | 0                  | 0                                                                                      | 0                                      | 0                                            | 0                                                                        | 0                                                                           | 0                | 0                                             |
| SVOCs                                                                | 0                       | 0                                  | 0                  | 0                                                                                      | 0                                      | 0                                            | 0                                                                        | 0                                                                           | 0                | 0                                             |
| Total PCBs                                                           | 0                       | 0                                  | 0                  | 0                                                                                      | 0                                      | 0                                            | 0                                                                        | 0                                                                           | 0                | 0                                             |
| Pesticides                                                           | 0                       | 0                                  | 0                  | 0                                                                                      | 0                                      | 0                                            | 0                                                                        | 0                                                                           | 0                | 0                                             |
| COCs exceeding applicable regulatory criteria in one or more samples |                         |                                    |                    | Not Applicable                                                                         |                                        |                                              |                                                                          |                                                                             |                  |                                               |

NA\* = The EGLE drinking water and groundwater/surface water interface pathway criteria exceedances for metals are excluded from the groundwater evaluation as explained in Section 4.2.5.

\*Denotes total number of specific instances of an analyte being detected or exceeding criteria, can be multiple within one sample location.

\*\*Denotes total number of samples exceeding criteria, cannot be multiple within one sample location.

Total exceedance column does not include MSSLS or non-applicable criteria (DWC and GSIC for metals).

## 9.2.2 Extent of Contamination

The comparison of historic analytical results to applicable regulatory criteria indicates that potential human health and ecological risks are present in soil in at least one location in Area H. Recalling the goals and objectives of the SI, the following subsections describe the extent of contamination in environmental media in the study area.

### 9.2.2.1 Soil Extent of Contamination

Drawing upon historic analytical data only, soil analytical results for organic contaminants exceeded GSIPC at one location (GP-1). Additionally, historic analytical results indicate that mercury was detected exceeding residential and nonresidential MSSLS at four (4) total locations and VOCs exceeded residential and nonresidential MSSLS at one location (GP-1).

Most of the samples were collected from subsurface soil intervals from areas that are generally accessible to the public despite being a privately-owned property. The sampling locations were within approximately 50 ft to 300 ft of the shoreline of the Portage Canal.

In the case of Area H, elevated concentrations of inorganic and VOC contaminants potentially include exposure risks related to inhalation pathways, which must be a consideration when evaluating land use, property accessibility, and the extent of contamination in surface and near surface soils that could be encountered through normal use of the property.

The remaining exposure risks are generally related to the leaching of contaminants to groundwater and their potential impacts on surface water; however, the extent of VOC contaminants have not been fully investigated. These risks pose a long-term threat to the overall environmental health of the watershed. The widespread distribution of inorganic COCs throughout the region limit determinations related to the extent of contamination in Area H.

#### 9.2.2.2 *Groundwater Extent of Contamination*

Historical groundwater analytical results did not exceed EGLE Part 201 Clean up Criteria for Response Action; however, the mercury detection exceeded shallow groundwater MSSLs for residential and nonresidential exposure pathways at one location (MW-1).

No other analyzed constituents were detected above EGLE criteria within Area H. Groundwater depths were not available for historic sample locations. The groundwater sampling locations were established in a zone roughly 50 ft to 300 ft to the shoreline of the Portage Canal.

### 9.3 **CONCLUSIONS AND RECOMMENDATIONS**

The analytical results and interpretation summarized in the preceding subsections document potential human health and ecological risks that are present in Area H. The following subsections provide a synopsis of these findings and a recommended path forward for mitigating these risks in Area H.

#### 9.3.1 **Conclusions**

Environmental impacts in Area H are generally characterized by detections of organic and inorganic contaminants in soil. Specific sources of these contaminants are not fully understood.

The historic analytical results summarized above provide sufficient analytical data and lines of evidence to conclude that the study area is a "Facility" as defined in Section 20101(1)(s) of the NREPA. The following table provides a summary of the affected environmental media, applicable regulatory criteria, and potential receptors within Area H.

| Area H – Media, Criteria, Potential Receptor Summary                 |                           |                                     |                |                                        |                                     |                              |                |                        |            |               |              |                                                        |                              |               |              |
|----------------------------------------------------------------------|---------------------------|-------------------------------------|----------------|----------------------------------------|-------------------------------------|------------------------------|----------------|------------------------|------------|---------------|--------------|--------------------------------------------------------|------------------------------|---------------|--------------|
| Media                                                                | Soil                      |                                     |                | Groundwater                            |                                     |                              | Air            |                        | Sediment   | Surface Water |              | Building Materials, Asbestos, and Abandoned Containers |                              |               |              |
| Criteria                                                             | Drinking Water Protection | Groundwater Surface Water Interface | Direct Contact | Drinking Water Protection              | Groundwater Surface Water Interface | Flammability and Explosivity | Volatilization | Particulate Inhalation | Ecological | Ecological    | Human Health | Particulate Inhalation                                 | Flammability and Explosivity | Environmental | Human Health |
| Potential Receptor                                                   |                           |                                     |                |                                        |                                     |                              |                |                        |            |               |              |                                                        |                              |               |              |
| Residential Human                                                    |                           |                                     |                |                                        |                                     |                              |                |                        |            |               |              |                                                        |                              |               |              |
| Nonresidential Human                                                 |                           |                                     |                |                                        |                                     |                              |                |                        |            |               |              |                                                        |                              |               |              |
| Water Column Organism                                                |                           |                                     |                |                                        |                                     |                              |                |                        |            |               |              |                                                        |                              |               |              |
| Benthic Organism                                                     |                           |                                     |                |                                        |                                     |                              |                |                        |            |               |              |                                                        |                              |               |              |
| COCs exceeding applicable regulatory criteria in one or more samples |                           |                                     |                | 1,2,4-TRIMETHYLBENZENE, XYLENE - TOTAL |                                     |                              |                |                        |            |               |              |                                                        |                              |               |              |

In addition to the evaluation of historical analytical results evaluated from Area H, the following provides a summary of findings derived from the assessment of Area H with respect to the goals and objectives for the Project:

- Terrestrial sources of contamination are present in the form of VOCs and limited inorganic COCs in the study area. Based on the availability of historic analytical data, the extent of contamination around the GP-1 sampling location in Area H does not appear to have been fully investigated.
- Soil impacts on the MDNR trail property exceeded MSSLs for residential and nonresidential scenarios but did not exceed PSIC or DCC.

### 9.3.2 Recommendations

The conclusions outlined in the preceding subsection establish that Area H is a Part 201 Facility. Section 20107a of Part 201 of NREPA describes the duties of owners or operators of a Facility, regardless of their liability, including: prevent unacceptable exposures, prevent exacerbation, and take reasonable precautions against the foreseeable actions of third parties. Some exceptions may apply; in any case, owners and operators of contaminated properties should become familiar with Section 20107a and the associated Rules.



## FIGURES

### DETAILED FINDINGS REPORT – AREA H





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## TABLES

### DETAILED FINDINGS REPORT – AREA H



TABLE 9-1  
Summary of Soil Analytical Results  
Area H  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code                |            | EGLE Part 201 Generic Cleanup Criteria                                     |                                                                |                                                                                                |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |            | Area H    |            |           |            |         |            |         |            |           |            |         |            |  |
|------------------------------|------------|----------------------------------------------------------------------------|----------------------------------------------------------------|------------------------------------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------------------|----------------------------------------------------------------------|------------------------------------------------------|----------------------------------|-----------------------------------------------------------------------------|------------|-----------|------------|-----------|------------|---------|------------|---------|------------|-----------|------------|---------|------------|--|
| Station Name                 | CAS Number | [2]<br>Groundwater<br>Surface Water<br>Interface<br>Protection<br>Criteria | [4]<br>Residential<br>Drinking Water<br>Protection<br>Criteria | [5]<br>Residential Soil<br>Volatilization<br>to Indoor Air<br>Inhalation<br>Criteria<br>(VSIC) | [9]<br>Residential<br>Particulate<br>Soil Inhalation<br>Criteria | [10]<br>Residential<br>Direct<br>Contact<br>Criteria | [11]<br>Nonresidential<br>Drinking Water<br>Protection<br>Criteria | [16]<br>Nonresidential<br>Particulate<br>Soil Inhalation<br>Criteria | [17]<br>Nonresidential<br>Direct Contact<br>Criteria | [18]<br>Soil Residential<br>MSSL | [19]<br>Soil<br>Nonresidential<br>MSSL                                      | GP-1       |           | GP-2       |           | GP-3       |         | GP-4       |         |            |           | GP-5       |         |            |  |
| Field Sample ID              |            |                                                                            |                                                                |                                                                                                |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | GP-1 (7ft) |           | GP-2 (4ft) |           | GP-3 (2ft) |         | GP-3 (3ft) |         | GP-4 (2ft) |           | GP-4 (4ft) |         | GP-5 (2ft) |  |
| Sample Date                  |            |                                                                            |                                                                |                                                                                                |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | 6/13/2012  |           | 6/13/2012  |           | 6/13/2012  |         | 6/13/2012  |         | 6/13/2012  |           | 6/13/2012  |         | 6/13/2012  |  |
| Sample Interval (bgs)        |            |                                                                            |                                                                |                                                                                                |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | 7 ft       |           | 4 ft       |           | 2 ft       |         | 3 ft       |         | 2 ft       |           | 4 ft       |         | 2 ft       |  |
| Sample Description           |            |                                                                            |                                                                |                                                                                                |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | --         |           | --         |           | --         |         | --         |         | --         |           | --         |         | --         |  |
|                              |            |                                                                            |                                                                |                                                                                                |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | Result     | Exceeds   | Result     | Exceeds   | Result     | Exceeds | Result     | Exceeds | Result     | Exceeds   | Result     | Exceeds |            |  |
| Inorganics - Metals (mg/kg)  |            |                                                                            |                                                                |                                                                                                |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |            |           |            |           |            |         |            |         |            |           |            |         |            |  |
| ALUMINIUM                    | 7429-90-5  | NA                                                                         | 6900 (B)                                                       | NLV                                                                                            | ID                                                               | 50,000 (D,BB)                                        | 6,900 (B)                                                          | ID                                                                   | 3.7E+5 (D,BB)                                        | NA                               | NA                                                                          | NM         | --        | NM         | --        | NM         | --      | NM         | --      | NM         | --        | NM         | --      |            |  |
| ANTIMONY                     | 7440-36-0  | 1.2 (X)                                                                    | 4.3                                                            | NLV                                                                                            | 13,000                                                           | 180                                                  | 4.3                                                                | 5,900                                                                | 670                                                  | NA                               | NA                                                                          | NM         | --        | NM         | --        | NM         | --      | NM         | --      | NM         | --        | NM         | --      |            |  |
| ARSENIC                      | 7440-38-2  | 4.6                                                                        | 4.6                                                            | NLV                                                                                            | 720                                                              | 7.6                                                  | 4.6                                                                | 910                                                                  | 37                                                   | NA                               | NA                                                                          | 3.7        | --        | <0.1 U     | --        | 0.53       | --      | NM         | --      | 0.54       | --        | NM         | --      |            |  |
| BARIUM                       | 7440-39-3  | 130 (B,G)                                                                  | 1,300 (B)                                                      | NLV                                                                                            | 3.3E+5 (B)                                                       | 37,000 (B)                                           | 1,300 (B)                                                          | 1.5E+5 (B)                                                           | 1.3E+5 (B)                                           | NA                               | NA                                                                          | 58         | --        | 6          | --        | 12         | --      | NM         | --      | 6          | --        | NM         | --      |            |  |
| BERYLLIUM                    | 7440-41-7  | 24 (G)                                                                     | 51                                                             | NLV                                                                                            | 1,300                                                            | 410                                                  | 51                                                                 | 590                                                                  | 1,600                                                | NA                               | NA                                                                          | NM         | --        | NM         | --        | NM         | --      | NM         | --      | NM         | --        | NM         | --      |            |  |
| CADMIUM                      | 7440-43-9  | 1.6 (B,G,X)                                                                | 6.0 (B)                                                        | NLV                                                                                            | 1,700 (B)                                                        | 550 (B)                                              | 6.0 (B)                                                            | 2,200 (B)                                                            | 2,100 (B)                                            | NA                               | NA                                                                          | 0.74       | --        | <0.2 U     | --        | <0.2 U     | --      | NM         | --      | <0.2 U     | --        | NM         | --      |            |  |
| CALCIUM                      | 7440-70-2  | NA                                                                         | NA                                                             | NA                                                                                             | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM         | --        | NM         | --        | NM         | --      | NM         | --      | NM         | --        | NM         | --      |            |  |
| CHROMIUM                     | 7440-47-3  | 1.2E+6 (B,G,H,X)                                                           | 1.0E+6 (B,D,H)                                                 | NLV                                                                                            | 3.30E+8 (B,H)                                                    | 7.90E+5 (B,H)                                        | 1.00E+6 (B,D,H)                                                    | 1.50E+5 (B,H)                                                        | 1.00E+6 (B,D,H)                                      | NA                               | NA                                                                          | 37         | --        | 18         | --        | 13         | --      | NM         | --      | 18         | --        | NM         | --      |            |  |
| COBALT                       | 7440-48-4  | 2                                                                          | 0.8                                                            | NLV                                                                                            | 13,000                                                           | 2,600                                                | 2                                                                  | 5,900                                                                | 9,000                                                | NA                               | NA                                                                          | NM         | --        | NM         | --        | NM         | --      | NM         | --      | NM         | --        | NM         | --      |            |  |
| COPPER                       | 7440-50-8  | 32 (B,G)                                                                   | 5,800 (B)                                                      | NLV                                                                                            | 130,000 (B)                                                      | 20,000 (B)                                           | 5,800 (B)                                                          | 59,000 (B)                                                           | 73,000 (B)                                           | NA                               | NA                                                                          | NM         | --        | NM         | --        | NM         | --      | NM         | --      | NM         | --        | NM         | --      |            |  |
| IRON                         | 7439-89-6  | --                                                                         | 12,000 (B)                                                     | NLV                                                                                            | ID                                                               | 160,000 (B)                                          | 12,000 (B)                                                         | ID                                                                   | 580,000 (B)                                          | NA                               | NA                                                                          | NM         | --        | NM         | --        | NM         | --      | NM         | --      | NM         | --        | NM         | --      |            |  |
| LEAD                         | 7439-92-1  | 2,500 (B,G,X)                                                              | 700 (B)                                                        | NLV                                                                                            | 100,000 (B)                                                      | 400 (B)                                              | 700 (B)                                                            | 44,000 (B)                                                           | 900 (B,DD)                                           | NA                               | NA                                                                          | 100        | --        | 8.7        | --        | 1.2        | --      | NM         | --      | 9.5        | --        | NM         | --      |            |  |
| LITHIUM                      | 7439-93-2  | 9.8 (B)                                                                    | 9.8 (B)                                                        | NLV                                                                                            | 2.30E+9 (B)                                                      | 4,200 (B,DD)                                         | 9.8 (B)                                                            | 1.00E+6 (B)                                                          | 31,000 (B,DD)                                        | NA                               | NA                                                                          | NM         | --        | NM         | --        | NM         | --      | NM         | --      | NM         | --        | NM         | --      |            |  |
| MAGNESIUM                    | 7439-95-4  | --                                                                         | 8,000 (B)                                                      | NLV                                                                                            | 6.70E+6 (B)                                                      | 1.0E+9 (B,D)                                         | 22,000 (B)                                                         | 2.90E+6 (B)                                                          | 1.00E+6 (B,D)                                        | NA                               | NA                                                                          | NM         | --        | NM         | --        | NM         | --      | NM         | --      | NM         | --        | NM         | --      |            |  |
| MANGANESE                    | 7439-96-5  | 440 (B,G,X)                                                                | 440 (B)                                                        | NLV                                                                                            | 3,300 (B)                                                        | 25,000 (B)                                           | 440 (B)                                                            | 1,500 (B)                                                            | 90,000 (B)                                           | NA                               | NA                                                                          | NM         | --        | NM         | --        | NM         | --      | NM         | --      | NM         | --        | NM         | --      |            |  |
| MERCURY                      | 7439-97-6  | 0.13 (B,Z)                                                                 | 1.7 (B,Z)                                                      | 48 (B,Z)                                                                                       | 20,000 (B,Z)                                                     | 160 (B,Z)                                            | 1.7 (B,Z)                                                          | 8,800 (B,Z)                                                          | 580 (B,Z)                                            | 0.022 (M)                        | 0.066                                                                       | 0.31       | [2,18,19] | 0.36       | [2,18,19] | <0.05 U    | --      | NM         | --      | 0.26       | [2,18,19] | NM         | --      |            |  |
| NICKEL                       | 7440-02-0  | 29 (G)                                                                     | 100 (B)                                                        | NLV                                                                                            | 13,000 (B)                                                       | 40,000 (B)                                           | 100 (B)                                                            | 16,000 (B)                                                           | 1.50E+5 (B)                                          | NA                               | NA                                                                          | NM         | --        | NM         | --        | NM         | --      | NM         | --      | NM         | --        | NM         | --      |            |  |
| POTASSIUM                    | 7440-09-7  | NA                                                                         | NA                                                             | NA                                                                                             | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM         | --        | NM         | --        | NM         | --      | NM         | --      | NM         | --        | NM         | --      |            |  |
| SELENIUM                     | 7782-49-2  | 0.41 (B)                                                                   | 4.0 (B)                                                        | NLV                                                                                            | 130,000 (B)                                                      | 2,600 (B)                                            | 4.0 (B)                                                            | 59,000 (B)                                                           | 9,600 (B)                                            | NA                               | NA                                                                          | 1.6        | [2]       | 0.92       | [2]       | 0.41       | [2]     | NM         | --      | 0.9        | [2]       | NM         | --      |            |  |
| SILVER                       | 7440-22-4  | 1.0 (B,M)                                                                  | 4.5 (B)                                                        | NLV                                                                                            | 6700 (B)                                                         | 2500 (B)                                             | 13 (B)                                                             | 2,900 (B)                                                            | 9,000 (B)                                            | NA                               | NA                                                                          | 2.8        | [2]       | 3.1        | [2]       | <0.1 U     | --      | NM         | --      | 1.9        | [2]       | NM         | --      |            |  |
| SODIUM                       | 7440-23-5  | NA                                                                         | 4,600                                                          | NLV                                                                                            | ID                                                               | 1.0E+6 (D)                                           | NA                                                                 | ID                                                                   | 1.0E+6 (D)                                           | NA                               | NA                                                                          | NM         | --        | NM         | --        | NM         | --      | NM         | --      | NM         | --        | NM         | --      |            |  |
| VANADIUM                     | 7440-62-2  | 430                                                                        | 72                                                             | NLV                                                                                            | ID                                                               | 750 (DD)                                             | 990                                                                | ID                                                                   | 5,500 (DD)                                           | NA                               | NA                                                                          | NM         | --        | NM         | --        | NM         | --      | NM         | --      | NM         | --        | NM         | --      |            |  |
| ZINC                         | 7440-66-6  | 62 (B,G)                                                                   | 2,400 (B)                                                      | NLV                                                                                            | ID                                                               | 1.70E+5 (B)                                          | 5,000 (B)                                                          | ID                                                                   | 6.30E+5 (B)                                          | NA                               | NA                                                                          | NM         | --        | NM         | --        | NM         | --      | NM         | --      | NM         | --        | NM         | --      |            |  |
| Inorganics - Cyanide (mg/kg) |            |                                                                            |                                                                |                                                                                                |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |            |           |            |           |            |         |            |         |            |           |            |         |            |  |
| CYANIDE                      | 57-12-5    | 0.1 (P,R)                                                                  | 4.0 (P,R)                                                      | NLV                                                                                            | 250 (P,R)                                                        | 12 (P,R)                                             | 4.0 (P,R)                                                          | 250 (P,R)                                                            | 250 (P,R)                                            | NA                               | NA                                                                          | NM         | --        | NM         | --        | NM         | --      | NM         | --      | NM         | --        | NM         | --      |            |  |
| Organics - PCBs (ug/kg)      |            |                                                                            |                                                                |                                                                                                |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |            |           |            |           |            |         |            |         |            |           |            |         |            |  |
| AROCLOR-1260                 | 11096-82-5 | NA                                                                         | NA                                                             | NA                                                                                             | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM         | --        | NM         | --        | NM         | --      | NM         | --      | NM         | --        | NM         | --      |            |  |
| AROCLOR-1262                 | 37324-23-5 | NA                                                                         | NA                                                             | NA                                                                                             | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM         | --        | NM         | --        | NM         | --      | NM         | --      | NM         | --        | NM         | --      |            |  |
| TOTAL PCBs                   | 1336-36-6  | NLL                                                                        | NLL                                                            | 3.00E+6 (J,T)                                                                                  | 5.20E+6 (J,T)                                                    | 1,000 (J,T)                                          | NLL                                                                | 6.50E+6 (J,T)                                                        | 1,000 (J,T)                                          | NA                               | NA                                                                          | NM         | --        | NM         | --        | NM         | --      | NM         | --      | NM         | --        | NM         | --      |            |  |
| Organics - SVOCs (ug/kg)     |            |                                                                            |                                                                |                                                                                                |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |            |           |            |           |            |         |            |         |            |           |            |         |            |  |
| 1,1-BIPHENYL                 | 92-52-4    | NA                                                                         | NA                                                             | NA                                                                                             | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM         | --        | NM         | --        | NM         | --      | NM         | --      | NM         | --        | NM         | --      |            |  |
| 2-METHYLNAPHTHALENE (SVOC)   | 91-57-6S   | 4,200                                                                      | 57,000                                                         | 2.70E+06                                                                                       | 6.70E+08                                                         | 8.10E+06                                             | 1.70E+05                                                           | 2.90E+08                                                             | 2.60E+07                                             | NA                               | NA                                                                          | NM         | --        | NM         | --        | NM         | --      | NM         | --      | NM         | --        | NM         | --      |            |  |
| ACENAPHTHENE                 | 83-32-9    | 8,700                                                                      | 3.00E+05                                                       | 1.90E+08                                                                                       | 1.40E+10                                                         | 4.10E+07                                             | 8.80E+05                                                           | 6.20E+09                                                             | 1.30E+08                                             | NA                               | NA                                                                          | NM         | --        | NM         | --        | NM         | --      | NM         | --      | NM         | --        | NM         | --      |            |  |
| ACENAPHTHYLENE               | 208-96-8   | ID                                                                         | 5,900                                                          | 1.60E+06                                                                                       | 2.30E+09                                                         | 1.60E+06                                             | 17,000                                                             | 1.00E+09                                                             | 5.20E+06                                             | NA                               | NA                                                                          | NM         | --        | NM         | --        | NM         | --      | NM         | --      | NM         | --        | NM         | --      |            |  |
| ACETOPHENONE                 | 98-86-2    | ID                                                                         | 30,000                                                         | 1.20E+8 (C)                                                                                    | 3.30E+10                                                         | 4.70E+7 (C)                                          | 88,000                                                             | 1.40E+10                                                             | 1.50E+8 (C)                                          | NA                               | NA                                                                          | NM         | --        | NM         | --        | NM         | --      | NM         | --      | NM         | --        | NM         | --      |            |  |
| ANTHRACENE                   | 120-12-7   | ID                                                                         | 41,000                                                         | 1.00E+9 (D)                                                                                    | 6.70E+10                                                         | 2.30E+08                                             | 41,000                                                             | 2.90E+10                                                             | 7.30E+08                                             | NA                               | NA                                                                          | NM         | --        | NM         | --        | NM         | --      | NM         | --      | NM         | --        | NM         | --      |            |  |
| BENZALDEHYDE                 | 100-52-7   | NA                                                                         | NA                                                             | NA                                                                                             | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM         | --        | NM         | --        | NM         | --      | NM         | --      | NM         | --        | NM         | --      |            |  |
| BENZO(A)ANTHRACENE           | 56-55-3    | NLL                                                                        | NLL                                                            | NLV                                                                                            | ID                                                               | 20,000 (Q)                                           | NLL                                                                | ID                                                                   | 80,000 (Q)                                           | NA                               | NA                                                                          | NM         | --        | NM         | --        | NM         | --      | NM         | --      | NM         | --        | NM         | --      |            |  |
| BENZO(A)PYRENE               | 50-32-8    | NLL                                                                        | NLL                                                            | NLV                                                                                            | 1.50E+8 (Q)                                                      | 2,000 (Q)                                            | NLL                                                                | 1.90E+6 (Q)                                                          | 8,000 (Q)                                            | NA                               | NA                                                                          | NM         | --        | NM         | --        | NM         | --      | NM         | --      | NM         | --        | NM         | --      |            |  |
| BENZO(B)FLUORANTHENE         | 205-99-2   | NLL                                                                        | NLL                                                            | ID                                                                                             | ID                                                               | 20,000 (Q)                                           | NLL                                                                | ID                                                                   | 80,000 (Q)                                           | NA                               | NA                                                                          | NM         | --        | NM         | --        | NM         | --      | NM         | --      | NM         | --        | NM         | --      |            |  |
| BENZO(G,H,I)PERYLENE         | 191-24-2   | NLL                                                                        | NLL                                                            | NLV                                                                                            | 8.00E+08                                                         | 2.50E+06                                             | NLL                                                                | 3.50E+08                                                             | 7.00E+06                                             | NA                               | NA                                                                          | NM         | --        | NM         | --        | NM         | --      | NM         | --      | NM         | --        | NM         | --      |            |  |
| BENZO(K)FLUORANTHENE         | 207-08-9   | NLL                                                                        | NLL                                                            | NLV                                                                                            | ID                                                               | 2.00E+5 (Q)                                          | NLL                                                                | ID                                                                   | 8.00E+5 (Q)                                          | NA                               | NA                                                                          | NM         | --        | NM         | --        | NM         | --      | NM         | --      | NM         | --        | NM         | --      |            |  |
| BIS(2-ETHYLHEXYL)PHTHALATE   | 117-81-7   | NLL                                                                        | NLL                                                            | NLV                                                                                            | 7.00E+08                                                         | 2.80E+06                                             | NLL                                                                | 8.90E+08                                                             | 1.20E+7 (C)                                          | NA                               | NA                                                                          | NM         | --        | NM         | --        | NM         | --      | NM         | --      | NM         | --        | NM         | --      |            |  |
| BUTYL BENZYL PHTHALATE       | 85-68-7    | 13,000 (X)                                                                 | 2.20E+6 (C)                                                    | NLV                                                                                            | 4.70E+10                                                         | 3.60E+10 (C)                                         | 5.00E+6 (C)                                                        | 2.10E+10                                                             | 1.20E+8 (C)                                          | NA                               | NA                                                                          | NM         | --        | NM         | --        | NM         | --      | NM         | --      | NM         | --        | NM         | --      |            |  |
| CHRYSENE                     | 218-01-9   | NLL                                                                        | NLL                                                            | ID                                                                                             | ID                                                               | 2.00E+6 (Q)                                          | NLL                                                                | ID                                                                   | 8.00E+6 (Q)                                          | NA                               | NA                                                                          | NM         | --        | NM         | --        | NM         | --      | NM         | --      | NM         | --        | NM         | --      |            |  |

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 9-1  
Summary of Soil Analytical Results  
Area H  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code                      |            | EGLE Part 201 Generic Cleanup Criteria                                     |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |            | Area H    |            |         |            |         |            |         |            |         |            |         |            |         |
|------------------------------------|------------|----------------------------------------------------------------------------|-------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------------------|----------------------------------------------------------------------|------------------------------------------------------|----------------------------------|-----------------------------------------------------------------------------|------------|-----------|------------|---------|------------|---------|------------|---------|------------|---------|------------|---------|------------|---------|
| Station Name                       | CAS Number | [2]<br>Groundwater<br>Surface Water<br>Interface<br>Protection<br>Criteria | [4]<br>Residential<br>Drinking<br>Water<br>Protection<br>Criteria | [5]<br>Residential<br>Soil<br>Volatilization<br>to Indoor Air<br>Inhalation<br>Criteria<br>(VSIC) | [9]<br>Residential<br>Particulate<br>Soil Inhalation<br>Criteria | [10]<br>Residential<br>Direct<br>Contact<br>Criteria | [11]<br>Nonresidential<br>Drinking Water<br>Protection<br>Criteria | [16]<br>Nonresidential<br>Particulate<br>Soil Inhalation<br>Criteria | [17]<br>Nonresidential<br>Direct Contact<br>Criteria | [18]<br>Soil Residential<br>MSSL | [19]<br>Soil<br>Nonresidential<br>MSSL                                      | GP-1       |           | GP-2       |         | GP-3       |         | GP-4       |         |            |         | GP-5       |         |            |         |
| Field Sample ID                    |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | GP-1 (7ft) |           | GP-2 (4ft) |         | GP-3 (2ft) |         | GP-3 (3ft) |         | GP-4 (2ft) |         | GP-4 (4ft) |         | GP-5 (2ft) |         |
| Sample Date                        |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | 6/13/2012  |           | 6/13/2012  |         | 6/13/2012  |         | 6/13/2012  |         | 6/13/2012  |         | 6/13/2012  |         |            |         |
| Sample Interval (bgs)              |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | 7 ft       |           | 4 ft       |         | 2 ft       |         | 3 ft       |         | 2 ft       |         | 4 ft       |         | 2 ft       |         |
| Sample Description                 |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | --         |           | --         |         | --         |         | --         |         | --         |         | --         |         | --         |         |
|                                    |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | Result     | Exceeds   | Result     | Exceeds | Result     | Exceeds | Result     | Exceeds | Result     | Exceeds | Result     | Exceeds | Result     | Exceeds |
| Organics - SVOCs (ug/kg) Continued |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |            |           |            |         |            |         |            |         |            |         |            |         |            |         |
| DIBENZO(A,H)ANTHRACENE             | 53-70-3    | NLL                                                                        | NLL                                                               | NLV                                                                                               | ID                                                               | 2,000 (Q)                                            | NLL                                                                | ID                                                                   | 8,000 (Q)                                            | NA                               | NA                                                                          | NM         | --        | NM         | --      | NM         | --      | NM         | --      | NM         | --      | NM         | --      |            |         |
| DIBENZOFURAN                       | 132-64-9   | 1,700                                                                      | ID                                                                | 2.00E+06                                                                                          | 6.70E+06                                                         | ID                                                   | ID                                                                 | 2.90E+06                                                             | ID                                                   | NA                               | NA                                                                          | NM         | --        | NM         | --      | NM         | --      | NM         | --      | NM         | --      | NM         | --      |            |         |
| FLUORANTHENE                       | 206-44-0   | 5,500                                                                      | 730,000                                                           | 1.00E+9 (D)                                                                                       | 9.30E+09                                                         | 4.60E+07                                             | 730,000                                                            | 4.10E+09                                                             | 1.30E+08                                             | NA                               | NA                                                                          | NM         | --        | NM         | --      | NM         | --      | NM         | --      | NM         | --      | NM         | --      |            |         |
| FLUORENE                           | 86-73-7    | 5,300                                                                      | 390,000                                                           | 5.80E+08                                                                                          | 9.30E+09                                                         | 2.70E+07                                             | 890,000                                                            | 4.10E+09                                                             | 8.70E+07                                             | NA                               | NA                                                                          | NM         | --        | NM         | --      | NM         | --      | NM         | --      | NM         | --      | NM         | --      |            |         |
| INDENO(1,2,3-CD)PYRENE             | 193-39-5   | NLL                                                                        | NLL                                                               | NLV                                                                                               | ID                                                               | 20,000 (Q)                                           | NLL                                                                | ID                                                                   | 80,000 (Q)                                           | NA                               | NA                                                                          | NM         | --        | NM         | --      | NM         | --      | NM         | --      | NM         | --      | NM         | --      |            |         |
| NAPHTHALENE (SVOC)                 | 91-20-3S   | 730                                                                        | 35,000                                                            | 2.50E+05                                                                                          | 2.00E+08                                                         | 1.60E+07                                             | 1.00E+05                                                           | 8.80E+07                                                             | 5.20E+07                                             | NA                               | NA                                                                          | NM         | --        | NM         | --      | NM         | --      | NM         | --      | NM         | --      | NM         | --      |            |         |
| PHENANTHRENE                       | 85-01-8    | 2,100                                                                      | 56,000                                                            | 2.80E+06                                                                                          | 6.70E+06                                                         | 1.60E+06                                             | 1.60E+05                                                           | 2.90E+06                                                             | 5.20E+06                                             | NA                               | NA                                                                          | NM         | --        | NM         | --      | NM         | --      | NM         | --      | NM         | --      | NM         | --      |            |         |
| PYRENE                             | 129-00-0   | ID                                                                         | 4.80E+05                                                          | 1.00E+9 (D)                                                                                       | 6.70E+09                                                         | 2.90E+07                                             | 4.80E+05                                                           | 2.90E+09                                                             | 8.40E+07                                             | NA                               | NA                                                                          | NM         | --        | NM         | --      | NM         | --      | NM         | --      | NM         | --      | NM         | --      |            |         |
| Organics - VOCs (ug/kg)            |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |            |           |            |         |            |         |            |         |            |         |            |         |            |         |
| 1,2,3-TRIMETHYLBENZENE             | 526-73-8   | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | 270 (JT)                         | 800 (JT)                                                                    | NM         | --        | NM         | --      | NM         | --      | NM         | --      | NM         | --      | NM         | --      |            |         |
| 1,2,4-TRIMETHYLBENZENE             | 95-63-6    | 570 (I)                                                                    | 2,100 (I)                                                         | 4.3E+6 (C,I)                                                                                      | 8.20E+10 (I)                                                     | 3.2E+07 (C,I)                                        | 2,100 (I)                                                          | 3.60E+10 (I)                                                         | 1.00E+8 (C,I)                                        | 150 (JT)                         | 430 (JT)                                                                    | 1,100      | [2,18,19] | <100 U     | --      | NM         | --      | <100 U     | --      | NM         | --      | <100 U     | --      |            |         |
| 1,3,5-TRIMETHYLBENZENE             | 108-67-8   | 1,100 (I)                                                                  | 1,800 (I)                                                         | 2.6E+6 (C,I)                                                                                      | 8.20E+10 (I)                                                     | 3.2E+07 (C)                                          | 2,100 (I)                                                          | 3.60E+10 (I)                                                         | 1.00E+8 (C,I)                                        | 100 (JT)                         | 300 (JT)                                                                    | 330        | [18,19]   | <100 U     | --      | NM         | --      | <100 U     | --      | NM         | --      | <100 U     | --      |            |         |
| 2,2,4-TRIMETHYLPENTANE             | 540-84-1   | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM         | --        | NM         | --      | NM         | --      | NM         | --      | NM         | --      | NM         | --      |            |         |
| 2-METHYLNAPHTHALENE (VOC)          | 91-57-6V   | 4,200                                                                      | 57,000                                                            | 2.70E+06                                                                                          | 6.70E+08                                                         | 8.10E+06                                             | 1.70E+05                                                           | 2.90E+08                                                             | 2.60E+07                                             | NA                               | NA                                                                          | 1,800      | --        | <330 U     | --      | NM         | --      | <330 U     | --      | NM         | --      | <330 U     | --      |            |         |
| BENZENE                            | 71-43-2    | 240 (I,X)                                                                  | 100 (I)                                                           | 1,600 (I)                                                                                         | 3.80E+8 (I)                                                      | 1.8E+5 (I)                                           | 100 (I)                                                            | 4.70E+8 (I)                                                          | 8.40E+5 (C,I)                                        | 1.7 (M)                          | 7.9 (M)                                                                     | <50 U      | --        | <50 U      | --      | NM         | --      | <50 U      | --      | NM         | --      | <50 U      | --      |            |         |
| CYCLOHEXANE                        | 110-82-7   | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM         | --        | NM         | --      | NM         | --      | NM         | --      | NM         | --      | NM         | --      |            |         |
| ETHYLBENZENE                       | 100-41-4   | 360                                                                        | 1,500                                                             | 87,000                                                                                            | 1.00E+10                                                         | 2.20E+07                                             | 1,500                                                              | 1.30E+10                                                             | 7.10E+07                                             | 12 (M)                           | 57                                                                          | 150        | [18,19]   | <50 U      | --      | NM         | --      | <50 U      | --      | NM         | --      | <50 U      | --      |            |         |
| HEXANE                             | 110-54-3   | NA                                                                         | 1.8E+5 (C)                                                        | 5.1E+5 (C)                                                                                        | 1.30E+10                                                         | 9.2E+7 (C)                                           | 5.10E+5 (C)                                                        | 5.90E+09                                                             | 3.00E+8 (C)                                          | 25                               | 74                                                                          | NM         | --        | NM         | --      | NM         | --      | NM         | --      | NM         | --      | NM         | --      |            |         |
| ISOPROPYLBENZENE                   | 98-82-8    | 3,200                                                                      | 91,000                                                            | 4.00E+5 (C)                                                                                       | 5.80E+09                                                         | 2.50E+7 (C)                                          | 2.60E+05                                                           | 2.60E+09                                                             | 8.00E+7 (C)                                          | NA                               | NA                                                                          | <250 U     | --        | <250 U     | --      | NM         | --      | <250 U     | --      | NM         | --      | <250 U     | --      |            |         |
| M,P-XYLENE                         | 1330-20-7  | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | 710        | --        | <100 U     | --      | NM         | --      | <100 U     | --      | NM         | --      | <100 U     | --      |            |         |
| NAPHTHALENE (VOC)                  | 91-20-3V   | 730                                                                        | 35,000                                                            | 2.50E+05                                                                                          | 2.00E+08                                                         | 1.60E+07                                             | 1.00E+05                                                           | 8.80E+07                                                             | 5.20E+07                                             | NA                               | NA                                                                          | 410        | --        | <330 U     | --      | NM         | --      | <330 U     | --      | NM         | --      | <330 U     | --      |            |         |
| N-PROPYLBENZENE                    | 103-65-1   | ID                                                                         | 1,600 (I)                                                         | ID                                                                                                | 1.30E+9 (I)                                                      | 2.50E+6 (I)                                          | 4,600                                                              | 5.90E+08                                                             | 8.00E+06                                             | 1,800                            | 3,500                                                                       | 100        | --        | <100 U     | --      | NM         | --      | <100 U     | --      | NM         | --      | <100 U     | --      |            |         |
| O-XYLENE                           | 95-47-6    | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | 440        | --        | <50 U      | --      | NM         | --      | <50 U      | --      | NM         | --      | <50 U      | --      |            |         |
| P-ISOPROPYL TOLUENE (p-CYMENTHENE) | 99-87-6    | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM         | --        | NM         | --      | NM         | --      | NM         | --      | NM         | --      | NM         | --      |            |         |
| SEC-BUTYLBENZENE                   | 135-98-8   | ID                                                                         | 1,600                                                             | ID                                                                                                | 4.00E+08                                                         | 2.50E+06                                             | 4,600                                                              | 1.80E+08                                                             | 8.00E+06                                             | NA                               | NA                                                                          | NM         | --        | NM         | --      | NM         | --      | NM         | --      | NM         | --      | NM         | --      |            |         |
| STYRENE                            | 100-42-5   | 530 (X)                                                                    | 2,700                                                             | 2.50E+05                                                                                          | 5.50E+09                                                         | 4.00E+05                                             | 2,700                                                              | 6.90E+09                                                             | 1.90E+6 (C)                                          | NA                               | NA                                                                          | <50 U      | --        | <50 U      | --      | NM         | --      | <50 U      | --      | NM         | --      | <50 U      | --      |            |         |
| TETRACHLOROETHYLENE                | 127-18-4   | 220 (X)                                                                    | 100                                                               | 11,000                                                                                            | 2.70E+09                                                         | 2.0E+5 (C)                                           | 100                                                                | 1.20E+09                                                             | 9.30E+5 (C)                                          | 6.2 (M)                          | 12 (M)                                                                      | <50 U      | --        | <50 U      | --      | NM         | --      | <50 U      | --      | NM         | --      | <50 U      | --      |            |         |
| TOLUENE                            | 108-88-3   | 5,400 (I)                                                                  | 16,000 (I)                                                        | 3.30E+5 (C,I)                                                                                     | 2.70E+10 (I)                                                     | 5E+07 (C,I)                                          | 16,000 (I)                                                         | 1.20E+10 (I)                                                         | 1.60E+8 (C,I)                                        | 3,700                            | 11,000                                                                      | 390        | --        | <100 U     | --      | NM         | --      | <100 U     | --      | NM         | --      | <100 U     | --      |            |         |
| XYLENE - TOTAL                     | 1330-20-7  | 980 (I)                                                                    | 5,600 (I)                                                         | 6.30E+6 (I)                                                                                       | 2.90E+11 (I)                                                     | 4.1E+08 (C,I)                                        | 5,600 (I)                                                          | 1.30E+11 (I)                                                         | 1.00E+9 (C,D,I)                                      | 280 (J)                          | 830 (J)                                                                     | 1,150      | [2,18,19] | <150 U     | --      | NM         | --      | <150 U     | --      | NM         | --      | <150 U     | --      |            |         |
| Organics - Pesticides (ug/kg)      |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |            |           |            |         |            |         |            |         |            |         |            |         |            |         |
| 4,4-DDE                            | 72-55-9    | NLL                                                                        | NLL                                                               | NLV                                                                                               | 3.20E+07                                                         | 45,000                                               | NLL                                                                | 4.00E+07                                                             | 1.90E+05                                             | NA                               | NA                                                                          | NM         | --        | NM         | --      | NM         | --      | NM         | --      | NM         | --      | NM         | --      |            |         |
| 4,4-DDT                            | 50-29-3    | NLL                                                                        | NLL                                                               | NLV                                                                                               | 3.20E+07                                                         | 57,000                                               | NLL                                                                | 4.00E+07                                                             | 2.80E+05                                             | NA                               | NA                                                                          | NM         | --        | NM         | --      | NM         | --      | NM         | --      | NM         | --      | NM         | --      |            |         |
| ALDRIN                             | 309-00-2   | NLL                                                                        | NLL                                                               | 1.30E+06                                                                                          | 6.40E+05                                                         | 1,000                                                | NLL                                                                | 8.00E+05                                                             | 4,300                                                | NA                               | NA                                                                          | NM         | --        | NM         | --      | NM         | --      | NM         | --      | NM         | --      | NM         | --      |            |         |
| ALPHA-CHLORDANE                    | 5103-71-9  | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM         | --        | NM         | --      | NM         | --      | NM         | --      | NM         | --      | NM         | --      |            |         |
| BETA-BHC                           | 319-85-7   | ID                                                                         | 37                                                                | NLV                                                                                               | 5.90E+06                                                         | 5,400                                                | 150                                                                | 7.40E+06                                                             | 25,000                                               | NA                               | NA                                                                          | NM         | --        | NM         | --      | NM         | --      | NM         | --      | NM         | --      | NM         | --      |            |         |
| ENDOSULFAN I                       | 959-98-8   | NLL                                                                        | NLL                                                               | ID                                                                                                | ID                                                               | 1.4E+06 (J)                                          | NLL                                                                | ID                                                                   | 4.40E+06 (J)                                         | NA                               | NA                                                                          | NM         | --        | NM         | --      | NM         | --      | NM         | --      | NM         | --      | NM         | --      |            |         |
| ENDRIN KETONE                      | 53494-70-5 | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM         | --        | NM         | --      | NM         | --      | NM         | --      | NM         | --      | NM         | --      |            |         |
| GAMMA-CHLORDANE                    | 5103-74-2  | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM         | --        | NM         | --      | NM         | --      | NM         | --      | NM         | --      | NM         | --      |            |         |
| HEPTACHLOR                         | 76-44-8    | NLL                                                                        | NLL                                                               | 3.50E+05                                                                                          | 2.40E+06                                                         | 5,600                                                | NLL                                                                | 3.00E+06                                                             | 23,000                                               | NA                               | NA                                                                          | NM         | --        | NM         | --      | NM         | --      | NM         | --      | NM         | --      | NM         | --      |            |         |
| Other                              |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |            |           |            |         |            |         |            |         |            |         |            |         |            |         |
| CHLORIDE (mg/kg)                   | --         | 94 (X)                                                                     | 5,000                                                             | NLV                                                                                               | ID                                                               | 500 (F)                                              | 5,000                                                              | ID                                                                   | 500 (F)                                              | NA                               | NA                                                                          | NM         | --        | NM         | --      | NM         | --      | NM         | --      | NM         | --      | NM         | --      |            |         |
| PERCENT MOISTURE (%)               | --         | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM         | --        | NM         | --      | NM         | --      | NM         | --      | NM         | --      | NM         | --      |            |         |
| HYDROCARBONS, TOTAL (mg/kg)        | --         | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM         | --        | NM         | --      | NM         | --      | NM         | --      | NM         | --      | NM         | --      |            |         |

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 9-1  
Summary of Soil Analytical Results  
Area H  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Soil Table Footnotes:

- EGLE Part 201 residential and non-residential generic cleanup criteria and screening levels criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Release Date: December 30, 2013. Updated June 2018.

- Only detected analytes are listed - Gray rows indicate requested analyses. If no analytes are listed below a gray row then all analytes of that group were either not analyzed or not detected.

- **Bold** values are concentrations detected above the laboratory reporting limit.

- **Bold/Shaded** cells indicate analyte concentration exceeded applicable criteria. EGLE Part 201 criteria exceeded is indicated by the footnote in [brackets] following the result value and defined below:

- |                                                                                |                                                                                    |
|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| [2] - Groundwater Surface Water Interface Protection Criteria                  | [11] - Nonresidential Drinking Water Protection Criteria                           |
| [3] - Soil Saturation Concentration Screening Levels                           | [12] - Nonresidential Soil Volatilization to Indoor Air Inhalation Criteria (VIAC) |
| [4] - Residential Drinking Water Protection Criteria                           | [13] - Nonresidential Infinite Source Volatile Soil Inhalation Criteria (VSIC)     |
| [5] - Residential Soil Volatilization to Indoor Air Inhalation Criteria (VIAC) | [14] - Nonresidential Finite VSIC for 5 Meter Source Thickness                     |
| [6] - Residential Infinite Source Volatile Soil Inhalation Criteria (VSIC)     | [15] - Nonresidential Finite VSIC for 2 Meter Source Thickness                     |
| [7] - Residential Finite VSIC for 5 Meter Source Thickness                     | [16] - Nonresidential Particulate Soil Inhalation Criteria                         |
| [8] - Residential Finite VSIC for 2 Meter Source Thickness                     | [17] - Nonresidential Direct Contact Criteria                                      |
| [9] - Residential Particulate Soil Inhalation Criteria                         | [18] - Soil Residential MSSL                                                       |
| [10] - Residential Direct Contact Criteria                                     | [19] - Soil Nonresidential MSSL                                                    |

Evaluation based on EGLE Criteria at time of Project completion.

Samples described in this evaluation may actually refer to stamp sands or to other mining waste from the historic mining and reclamation processes conducted in the area.

- |                                  |                                                                                   |
|----------------------------------|-----------------------------------------------------------------------------------|
| -- = No Exceedances              | PCBs = Polychlorinated biphenyls                                                  |
| NM = Not Measured                | VOC = Volatile organic compound                                                   |
| ND = Not Detected                | SVOC = Semi-volatile organic compound                                             |
| bgs = Below ground surface       | MSSL = Media-Specific Volatilization to Indoor Air Interim Action Screening Level |
| ft = Feet                        | ug/kg = Micrograms per kilogram                                                   |
| in = Inches                      | % = Percentage                                                                    |
| mg/kg = Milligrams per kilogram. |                                                                                   |

Criteria Footnotes:

- ID = Insufficient data to develop criterion.
- NA = A criterion or value is not available
- NLL = Hazardous substance is not likely to leach under most soil conditions.
- (B) = Background, as defined in R 299.1(b), may be substituted if higher than the calculated cleanup criterion. Background levels may be less than criteria for some inorganic compounds.
- (BB) = The state drinking water standard for asbestos (fibers greater than 10 micrometers in length) is in units of a million fibers per liter of water (MFL). Soil concentrations of asbestos are determined by polarized light microscop.
- (C) = The criterion developed under R 299.20 to R 299.26 exceeds the chemical- specific soil saturation screening level (Csat). The person proposing or implementing response activity shall document whether additional response activity is required to control free-phase liquids or NAPL to protect against risks associated with free-phase liquids by using methods appropriate for the free-phase liquids present. Development of a site-specific Csat or methods presented in R 299.22, R 299.24(5), and R 299.26(8) may be conducted for the relevant exposure pathways.
- (D) = Calculated criterion exceeds 100 percent, hence it is reduced to 100 percent or 1.0E+9 parts per billion (ppb).
- (DD) = Hazardous substance causes developmental effects. Residential direct contact criteria are protective of both prenatal and postnatal exposure. Nonresidential direct contact criteria are protective for a pregnant adult receptor.
- (F) = Criterion is based on adverse impacts to plant life and phytotoxicity.
- (G) = Groundwater surface water interface (GSI) criterion depends on the pH or water hardness, or both, of the receiving surface water. The final chronic value (FCV) for the protection of aquatic life shall be calculated based on the pH or hardness of the receiving surface water. Where water hardness exceeds 400 mg Ca<sub>4</sub>/L, use 400 mg CaCO<sub>3</sub>/L for the FCV calculation. The FCV formula provides values in units of ug/L or ppb. The generic GSI criterion is the lesser of the calculated FCV, the wildlife value (WV), and the surface water human non-drinking water value (HNDV). The soil GSI protection criteria for these hazardous substances are the greater of the 20 times the GSI criterion or the GSI soil-water partition values using the GSI criteria developed with the procedure described in this footnote. A spreadsheet that may be used to calculate GSI and GSI protection criteria for (G)-footnoted hazardous substances is available on the Department of Environment, Great Lakes, and Energy (EGLE) internet web site. A hardness value of 47.5 CaC<sub>4</sub>L and pH of 7, derived from the Michigan Department of Environmental Quality Draft Site Inspection Report for Lake Linden Operations dated 3/29/13, was used in the footnote G calculation spreadsheet.
- (H) = Valence-specific chromium data (Cr III and Cr VI) shall be compared to the corresponding valence-specific cleanup criteria. If both Cr III and Cr VI are present in groundwater, the total concentration of both cannot exceed the drinking water criterion of 100 ug/L. If analytical data are provided for total chromium only, they shall be compared to the cleanup criteria for Cr VI. Cr III soil cleanup criterion for protection of drinking water can only be used at sites where groundwater is prevented from being used as a public water supply, currently and in the future, through an approved land or resource use restriction.
- (I) = Hazardous substance may exhibit the characteristic of ignitability as defined in 40 C.F.R. §261.21 (revised as of July 1, 2001), which is adopted by reference in these rules and is available for inspection at the EGLE, 525 West Allegan Street, Lansing, Michigan. Copies of the regulation may be purchased, at a cost as of the time of adoption of these rules of \$45, from the Superintendent of documents, Government Printing Office, Washington, DC 20401 (stock number 869-044-00155-1), or from the EGLE, Remediation and Redevelopment Division (RRD), 525 West Allegan Street, Lansing, Michigan 48933, at cost.
- (J) = Hazardous substance may be present in several isomer forms. Isomer-specific concentrations shall be added together for comparison to criteria.
- (M) = Calculated criterion is below the analytical target detection limit, therefore, the criterion defaults to the target detection limit.
- (P) = Amenable cyanide methods or method OIA-1677 shall be used to quantify cyanide concentrations for compliance with all groundwater criteria. Total cyanide methods or method OIA-1677 shall be used to quantify cyanide concentrations for compliance with soil criteria. Nonresidential direct contact criteria may not be protective of the potential for release of hydrogen cyanide gas. Additional land or resource use restrictions may be necessary to protect for the acute inhalation concerns associated with hydrogen cyanide gas.
- (Q) = Criteria for carcinogenic polycyclic aromatic hydrocarbons were developed using relative potential potencies to benzo(a)pyrene.
- (R) = Hazardous substance may exhibit the characteristic of reactivity as defined in 40 C.F.R. §261.23 (revised as of July 1, 2001), which is adopted by reference in these rules and is available for inspection at the EGLE, 525 West Allegan Street, Lansing, Michigan. Copies of the regulation may be purchased, at a cost as of the time of adoption of these rules of \$45, from the Superintendent of Documents, Government Printing Office, Washington, DC 20401 (stock number 869-044-00155-1), or from the EGLE, RRD, 525 West Allegan Street, Lansing, Michigan 48933, at cost.
- (T) = Refer to the federal Toxic Substances Control Act (TSCA), 40 C.F.R. §761, Subpart D and 40 C.F.R. §761, Subpart G, to determine the applicability of TSCA cleanup standards. Subpart D and Subpart G of 40 C.F.R. §761 (July 1, 2001) are adopted by reference in these rules and are available for inspection at the EGLE, 525 West Allegan Street, Lansing, Michigan. Copies of the regulations may be purchased, at a cost as of the time of adoption of these rules of \$55, from the Superintendent of Documents, Government Printing Office, Washington, DC 20401, or from the EGLE, RRD, 525 West Allegan Street, Lansing, Michigan 48933, at cost. Alternatives to compliance with the TSCA standards listed below are possible under 40 C.F.R. §761 Subpart D. New releases may be subject to the standards identified in 40 C.F.R. §761, Subpart G. Use Part 201 soil direct contact cleanup criteria in the published table if TSCA standards are not applicable.
- (X) = The GSI criterion shown in the generic cleanup criteria tables is not protective for surface water that is used as a drinking water source. (See R 299.49 Footnotes for generic cleanup criteria tables for additional information.)
- (Z) = Mercury is typically measured as total mercury. The generic cleanup criteria, however, are based on data for different species of mercury. Specifically, data for elemental mercury, chemical abstract service (CAS) number 7439976, serve as the basis for the soil volatilization to indoor air criteria, groundwater volatilization to indoor air, and soil inhalation criteria. Data for methyl mercury, CAS number 22967926, serve as the basis for the GSI criterion; and data for mercuric chloride, CAS number 7487947, serve as the basis for the drinking water, groundwater contact, soil direct contact, and the groundwater protection criteria. Comparison to criteria shall be based on species-specific analytical data only if sufficient facility characterization has been conducted to rule out the presence of other species of mercury.

MSSL Footnotes:

- J = Hazardous substance may be present in several isomer forms. Isomer-specific concentrations must be added together for comparison to screening level.
- JT = Hazardous substance may be present in several isomer forms. Screening levels may be used for the individual isomer provided that it is the sole isomer detected; however, when multiple isomers are detected in a medium, the isomer-specific concentrations must be added together and compared to the most restrictive screening level of the detected isomers.
- M = The screening level may be below target detection limits (TDL).

Laboratory Footnotes:

- J = The result is an estimated quantity.
- U = Analyte analyzed for but not detected above the reported sample reporting limit.
- UU = Analyte analyzed for but not detected above the reported sample reporting limit and is an estimated quantity.



**TABLE 9-1**  
**Summary of Soil Analytical Results**  
**Area H**  
**Quincy Mining Company Portage Operations Area**  
**Abandoned Mining Wastes - Torch Lake Non-Superfund Site**

|                                                                                                         | Part 201 Generic Cleanup Criteria Evaluated                                        | Exceedance |
|---------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------|
| <b>EGLE Part 201 Generic Cleanup Criteria<br/>(June 2018)</b>                                           | [2] - Groundwater Surface Water Interface Protection Criteria                      | YES        |
|                                                                                                         | [3] - Soil Saturation Concentration Screening Levels                               | NO         |
|                                                                                                         | [4] - Residential Drinking Water Protection Criteria                               | NO         |
|                                                                                                         | [5] - Residential Soil Volatilization to Indoor Air Inhalation Criteria (VIAC)     | NO         |
|                                                                                                         | [6] - Residential Infinite Source Volatile Soil Inhalation Criteria (VSIC)         | NO         |
|                                                                                                         | [7] - Residential Finite VSIC for 5 Meter Source Thickness                         | NO         |
|                                                                                                         | [8] - Residential Finite VSIC for 2 Meter Source Thickness                         | NO         |
|                                                                                                         | [9] - Residential Particulate Soil Inhalation Criteria                             | NO         |
|                                                                                                         | [10] - Residential Direct Contact Criteria                                         | NO         |
|                                                                                                         | [11] - Nonresidential Drinking Water Protection Criteria                           | NO         |
|                                                                                                         | [12] - Nonresidential Soil Volatilization to Indoor Air Inhalation Criteria (VIAC) | NO         |
|                                                                                                         | [13] - Nonresidential Infinite Source Volatile Soil Inhalation Criteria (VSIC)     | NO         |
|                                                                                                         | [14] - Nonresidential Finite VSIC for 5 Meter Source Thickness                     | NO         |
|                                                                                                         | [15] - Nonresidential Finite VSIC for 2 Meter Source Thickness                     | NO         |
|                                                                                                         | [16] - Nonresidential Particulate Soil Inhalation Criteria                         | NO         |
|                                                                                                         | [17] - Nonresidential Direct Contact Criteria                                      | NO         |
| <b>Media-Specific Volatilization to Indoor Air Interim<br/>Action Screening Levels<br/>(March 2021)</b> | [18] - Soil Residential Media-Specific Screening Level (MSSL)                      | YES        |
|                                                                                                         | [19] - Soil Nonresidential MSSL                                                    | YES        |

TABLE 9-2  
Summary of Groundwater Analytical Results  
Area H  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code                      |            | EGLE Part 201 Generic Cleanup Criteria           |                                                     |                                                              |                                                                                                |                                                                                                   |                         | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                                         |                                            |                                               |                                               |                                                             | Area H    |         |           |         |           |         |           |         |           |         |           |         |           |         |           |         |
|------------------------------------|------------|--------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------|-----------------------------------------------|-----------------------------------------------|-------------------------------------------------------------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|
| Station Name                       | CAS Number | [1]<br>Residential<br>Drinking Water<br>Criteria | [2]<br>Nonresidential<br>Drinking Water<br>Criteria | [3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [4]<br>Residential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [5]<br>Nonresidential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [6]<br>Water Solubility | [8]<br>Shallow<br>Groundwater<br>Residential<br>MSSL                        | [9]<br>Shallow<br>Groundwater<br>Nonresidential<br>MSSL | [10]<br>Groundwater<br>Residential<br>MSSL | [11]<br>Groundwater<br>Residential TS<br>MSSL | [12]<br>Groundwater<br>Nonresidential<br>MSSL | [13]<br>Groundwater<br>Nonresidential<br>MSSL <sub>12</sub> | GP-1      |         | GP-2      |         | GP-3      |         | GP-4      |         | GP-5      |         | MW-1      |         | MW-2      |         | MW-3      |         |
| Field Sample ID                    |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | GP-1      |         | GP-2      |         | GP-3      |         | GP-4      |         | GP-5      |         | MW-1      |         | MW-2      |         | MW-3      |         |
| Sample Date                        |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 6/13/2012 |         | 6/13/2012 |         | 6/13/2012 |         | 6/13/2012 |         | 6/13/2012 |         | 11/7/2013 |         | 11/7/2013 |         | 11/7/2013 |         |
| Sample Interval (bgs)              |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | --        |         | --        |         | --        |         | --        |         | --        |         | --        |         | --        |         | --        |         |
|                                    |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | Result    | Exceeds | Result    | Exceeds | Result    | Exceeds | Result    | Exceeds | Result    | Exceeds | Result    | Exceeds | Result    | Exceeds | Result    | Exceeds |
| Inorganics - Metals (ug/l)         |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |           |         |           |         |           |         |           |         |           |         |           |         |           |         |           |         |
| ARSENIC                            | 7440-38-2  | 10 (A)                                           | 10 (A)                                              | 10                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U      | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      |
| BARIUM                             | 7440-39-3  | 2,000 (A,B)                                      | 2,000 (A,B)                                         | 200 (B,G)                                                    | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 130       | --      | <100 U    | --      | <100 U    | --      | <100 U    | --      | <100 U    | --      | 180       | --      | <100 U    | --      | <100 U    | --      |
| CADMIUM                            | 7440-43-9  | 5.0 (A,B)                                        | 5.0 (A,B)                                           | 1.3 (B,G,X)                                                  | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      |
| CALCIUM                            | 7440-70-2  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| CHROMIUM                           | 7440-47-3  | 100 (A,B,H)                                      | 100 (A,B,H)                                         | 40 (B,G,H,X)                                                 | NA                                                                                             | NLV                                                                                               | NLV                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <10 U     | --      | 20        | --      | <10 U     | --      | <10 U     | --      | <10 U     | --      | <10 U     | --      | <10 U     | --      | <10 U     | --      |
| COPPER                             | 7440-50-8  | 4.0 (B,E)                                        | 4.0 (B,E)                                           | 14 (B,G)                                                     | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| LEAD                               | 7439-92-1  | 4.0 (B,L)                                        | 4.0 (B,L)                                           | 14 (B,G,X)                                                   | NVL                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <3 U      | --      | <3 U      | --      | <3 U      | --      | <3 U      | --      | <3 U      | --      | <3 U      | --      | <3 U      | --      | <3 U      | --      |
| MAGNESIUM                          | 7439-95-4  | 400,000 (B)                                      | 1,100,000 (B)                                       | NA                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| MANGANESE                          | 7439-96-5  | 50 (B,E)                                         | 50 (B,E)                                            | 1,000 (B,G,X)                                                | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| MERCURY                            | 7439-97-6  | 2.0 (A,B,Z)                                      | 2.0 (A,B,Z)                                         | 0.0013 (B,Z)                                                 | 56 (B,S,Z)                                                                                     | 56 (B,S,Z)                                                                                        | 56 (B,Z)                | 0.088                                                                       | 0.14                                                    | 1.4                                        | 4.3                                           | 4.3                                           | 8.5                                                         | <0.2 U    | --      | <0.2 U    | --      | <0.2 U    | --      | <0.2 U    | --      | <0.2 U    | --      | 0.66      | [3,8,9] | <0.2 U    | --      | <0.2 U    | --      |
| POTASSIUM                          | 7440-09-7  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| SELENIUM                           | 7782-49-2  | 50 (A,B)                                         | 50 (A,B)                                            | 5 (B)                                                        | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U      | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      | 5.9       | [3]     | <5 U      | --      | <5 U      | --      | <5 U      | --      |
| SILVER                             | 7440-22-4  | 34 (B)                                           | 98 (B)                                              | 0.2 (B,M)                                                    | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <0.2 U    | --      | 0.59      | [3]     | <0.2 U    | --      | <0.2 U    | --      | <0.2 U    | --      | 1.5       | [3]     | 0.51      | [3]     | 0.64      | [3]     |
| SODIUM                             | 7440-23-5  | 230,000 (HH)                                     | 350,000                                             | NA                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| STRONTIUM                          | 7440-24-6  | 4,600 (B)                                        | 13,000 (B)                                          | 21,000 (B)                                                   | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| ZINC                               | 7440-66-6  | 2,400 (B)                                        | 5,000 (B,E)                                         | 63 (B,G)                                                     | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| Organics - PCBs as Aroclors (ug/l) |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |           |         |           |         |           |         |           |         |           |         |           |         |           |         |           |         |
| TOTAL PCBs                         | 1336-36-6  | 0.5 (A,J,T)                                      | 0.5 (A,J,T)                                         | 0.2 (J,M,T)                                                  | 45 (J,S,T)                                                                                     | 45 (J,S,T)                                                                                        | 44.7 (J,T)              | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| Organics - SVOCs (ug/l)            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |           |         |           |         |           |         |           |         |           |         |           |         |           |         |           |         |
| 2-METHYLNAPHTHALENE (SVOC)         | 91-57-6S   | 260                                              | 750                                                 | 19                                                           | 25,000 (S)                                                                                     | 25,000 (S)                                                                                        | 24,600                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| ACENAPHTHENE                       | 83-32-9    | 1,300                                            | 3,800                                               | 38                                                           | 4,200 (S)                                                                                      | 4,200 (S)                                                                                         | 4,240                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| ACENAPHTHYLENE                     | 208-96-8   | 52                                               | 150                                                 | ID                                                           | 3,900 (S)                                                                                      | 3,900 (S)                                                                                         | 3,930                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| ANTHRACENE                         | 120-12-7   | 43 (S)                                           | 43 (S)                                              | ID                                                           | 43 (S)                                                                                         | 43 (S)                                                                                            | 43.4                    | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| BENZO(A)ANTHRACENE                 | 56-55-3    | 2.1 (Q)                                          | 8.5 (Q)                                             | ID                                                           | NLV                                                                                            | NLV                                                                                               | 9.4 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| BENZO(A)PYRENE                     | 50-32-8    | 5.0 (A,Q)                                        | 5.0 (A,Q)                                           | ID                                                           | NLV                                                                                            | NLV                                                                                               | 1.62 (Q)                | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| BENZO(B)FLUORANTHENE               | 205-99-2   | 1.5 (Q,S,AA)                                     | 1.5 (Q,S,AA)                                        | ID                                                           | ID                                                                                             | ID                                                                                                | 1.5 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| BENZO(G,H,I)PERYLENE               | 191-24-2   | 1.0 (M)                                          | 1.0 (M)                                             | ID                                                           | NLV                                                                                            | NLV                                                                                               | 0.26                    | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| BENZO(K)FLUORANTHENE               | 207-08-9   | 1.0 (M,Q)                                        | 1.0 (M,Q)                                           | NA                                                           | NLV                                                                                            | NLV                                                                                               | 0.8 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| CHRYSENE                           | 218-01-9   | 1.6 (Q,S)                                        | 1.6 (Q,S)                                           | ID                                                           | ID                                                                                             | ID                                                                                                | 1.6 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| FLUORANTHENE                       | 206-44-0   | 210 (S)                                          | 210 (S)                                             | 1.6                                                          | 210 (S)                                                                                        | 210 (S)                                                                                           | 206                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| FLUORENE                           | 86-73-7    | 880                                              | 2,000 (S)                                           | 12                                                           | 2,000 (S)                                                                                      | 2,000 (S)                                                                                         | 1,980                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| INDENO(1,2,3-CD)PYRENE             | 193-39-5   | 2.0 (M,Q)                                        | 2.0 (M,Q)                                           | ID                                                           | NLV                                                                                            | NLV                                                                                               | 0.022 (Q)               | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| NAPHTHALENE (SVOC)                 | 91-20-3S   | 520                                              | 1,500                                               | 11                                                           | 31,000 (S)                                                                                     | 31,000 (S)                                                                                        | 31,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| PENTACHLOROPHENOL                  | 87-86-5    | 1.0 (A)                                          | 1.0 (A)                                             | 1.8 (G,X)                                                    | NLV                                                                                            | NLV                                                                                               | 1.85E+06                | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| PHENANTHRENE                       | 85-01-8    | 52                                               | 150                                                 | 2.0 (M)                                                      | 1,000 (S)                                                                                      | 1,000 (S)                                                                                         | 1,000                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| PYRENE                             | 129-00-0   | 140 (S)                                          | 140 (S)                                             | ID                                                           | 140 (S)                                                                                        | 140 (S)                                                                                           | 135                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 9-2  
Summary of Groundwater Analytical Results  
Area H  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code              |            | EGLE Part 201 Generic Cleanup Criteria           |                                                     |                                                              |                                                                                                |                                                                                                   |                         | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                                         |                                            |                                               |                                               |                                                             | Area H    |         |           |         |           |         |           |         |           |         |           |         |           |         |           |         |
|----------------------------|------------|--------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------|-----------------------------------------------|-----------------------------------------------|-------------------------------------------------------------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|
| Station Name               | CAS Number | [1]<br>Residential<br>Drinking Water<br>Criteria | [2]<br>Nonresidential<br>Drinking Water<br>Criteria | [3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [4]<br>Residential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [5]<br>Nonresidential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [6]<br>Water Solubility | [8]<br>Shallow<br>Groundwater<br>Residential<br>MSSL                        | [9]<br>Shallow<br>Groundwater<br>Nonresidential<br>MSSL | [10]<br>Groundwater<br>Residential<br>MSSL | [11]<br>Groundwater<br>Residential TS<br>MSSL | [12]<br>Groundwater<br>Nonresidential<br>MSSL | [13]<br>Groundwater<br>Nonresidential<br>MSSL <sub>12</sub> | GP-1      |         | GP-2      |         | GP-3      |         | GP-4      |         | GP-5      |         | MW-1      |         | MW-2      |         | MW-3      |         |
| Field Sample ID            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | GP-1      |         | GP-2      |         | GP-3      |         | GP-4      |         | GP-5      |         | MW-1      |         | MW-2      |         | MW-3      |         |
| Sample Date                |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 6/13/2012 |         | 6/13/2012 |         | 6/13/2012 |         | 6/13/2012 |         | 6/13/2012 |         | 11/7/2013 |         | 11/7/2013 |         | 11/7/2013 |         |
| Sample Interval (bgs)      |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | --        |         | --        |         | --        |         | --        |         | --        |         | --        |         | --        |         | --        |         |
|                            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | Result    | Exceeds | Result    | Exceeds | Result    | Exceeds | Result    | Exceeds | Result    | Exceeds | Result    | Exceeds | Result    | Exceeds | Result    | Exceeds |
| Organics - VOCs (ug/l)     |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |           |         |           |         |           |         |           |         |           |         |           |         |           |         |           |         |
| 1,1,1-TRICHLOROETHANE      | 71-55-6    | 200 (A)                                          | 200 (A)                                             | 89                                                           | 660,000                                                                                        | 1,300,000 (S)                                                                                     | 1,330,000               | 180                                                                         | 500                                                     | 8,600                                      | 8,600                                         | 24,000                                        | 24,000                                                      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      |
| 1,2,3-TRIMETHYLBENZENE     | 526-73-8   | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | 43 (JT)                                                                     | 67 (JT)                                                 | 800 (JT)                                   | 2,400 (JT)                                    | 2,300 (JT)                                    | 4,700 (JT)                                                  | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| 1,2,4-TRIMETHYLBENZENE     | 95-63-6    | 63 (E,I)                                         | 63 (E,I)                                            | 17 (I)                                                       | 56,000 (I,S)                                                                                   | 56,000 (I,S)                                                                                      | 55,890 (I)              | 25 (JT)                                                                     | 44 (JT)                                                 | 440 (JT)                                   | 1,300 (JT)                                    | 1,300 (JT)                                    | 2,600 (JT)                                                  | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      |
| 1,3,5-TRIMETHYLBENZENE     | 108-67-8   | 72 (E,I)                                         | 72 (E,I)                                            | 45 (I)                                                       | 61,000 (I,S)                                                                                   | 61,000 (I,S)                                                                                      | 61,150 (I)              | 18 (JT)                                                                     | 30 (JT)                                                 | 310 (JT)                                   | 940 (JT)                                      | 920 (JT)                                      | 1,800 (JT)                                                  | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      |
| 2-METHYLNAPHTHALENE (VOC)  | 91-57-6V   | 260                                              | 750                                                 | 19                                                           | 25,000 (S)                                                                                     | 25,000 (S)                                                                                        | 24,600                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U      | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      |
| ACETONE                    | 67-64-1    | 730 (I)                                          | 2100 (I)                                            | 1700 (I)                                                     | 1.0E+9 (D,I,S)                                                                                 | 1.0E+9 (D,I,S)                                                                                    | 1.0E+9 (I)              | 50,000                                                                      | 62,000                                                  | 1.20E+07                                   | 1.20E+07                                      | 2.50E+07                                      | 2.50E+07                                                    | <50 U     | --      | <50 U     | --      | <50 U     | --      | 58        | --      | <50 U     | --      | <50 U     | --      | <50 U     | --      | <50 U     | --      |
| BENZENE                    | 71-43-2    | 5.0 (A,I)                                        | 5.0 (A,I)                                           | 12 (I,X)                                                     | 5,600 (I)                                                                                      | 35,000 (I)                                                                                        | 1,750,000 (I)           | 1                                                                           | 2.7                                                     | 14                                         | 82                                            | 66                                            | 130                                                         | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      |
| CYCLOHEXANE                | 110-82-7   | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| ETHYLBENZENE               | 100-41-4   | 74 (E,I)                                         | 74 (E,I)                                            | 18 (I)                                                       | 110,000 (I)                                                                                    | 170,000 (I,S)                                                                                     | 169,000 (I)             | 2.8                                                                         | 7.6                                                     | 45                                         | 450                                           | 210                                           | 420                                                         | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      |
| HEXANE                     | 110-54-3   | 3,000                                            | 8,600                                               | NA                                                           | 12,000 (S)                                                                                     | 12,000 (S)                                                                                        | 12,000                  | 29                                                                          | 85                                                      | 29 (GW)                                    | 33                                            | 85 (GW)                                       | 170 (GW)                                                    | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| ISOPROPYLBENZENE           | 98-82-8    | 800                                              | 2,300                                               | 28                                                           | 56,000 (S)                                                                                     | 56,000 (S)                                                                                        | 56,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U      | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      |
| M,P-XYLENE                 | 1330-20-7  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      |
| NAPHTHALENE (VOC)          | 91-20-3V   | 520                                              | 1,500                                               | 11                                                           | 31,000 (S)                                                                                     | 31,000 (S)                                                                                        | 31,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5 U      | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      | <5 U      | --      |
| N-PROPYLBENZENE            | 103-65-1   | 80 (I)                                           | 230 (I)                                             | ID                                                           | ID                                                                                             | ID                                                                                                | NA                      | 43                                                                          | 83                                                      | 4100                                       | 12000                                         | 8100                                          | 8100                                                        | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      |
| O-XYLENE                   | 95-47-6    | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      |
| TETRACHLOROETHYLENE        | 127-18-4   | 5.0 (A)                                          | 5.0 (A)                                             | 11 (X)                                                       | 25,000                                                                                         | 170,000                                                                                           | 200,000                 | 1.5                                                                         | 3                                                       | 96                                         | 96                                            | 190                                           | 380                                                         | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      |
| TOLUENE                    | 108-88-3   | 790 (E,I)                                        | 790 (E,I)                                           | 270 (I)                                                      | 530,000 (I,S)                                                                                  | 530,000 (I,S)                                                                                     | 526,000 (I)             | 300                                                                         | 570                                                     | 23,000                                     | 33,000                                        | 66,000                                        | 66,000                                                      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      |
| TRICHLOROETHYLENE          | 79-01-6    | 5.0 (A)                                          | 5.0 (A)                                             | 29 (X)                                                       | 2,200                                                                                          | 4,900                                                                                             | 1,100,000               | 0.073 (M)                                                                   | 0.14 (M)                                                | 6.1                                        | 18                                            | 12                                            | 24                                                          | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      | <1 U      | --      |
| XYLENE - TOTAL             | 1330-20-7  | 280 (E,I)                                        | 280 (E,I)                                           | 49 (I)                                                       | 190,000 (I,S)                                                                                  | 190,000 (I,S)                                                                                     | 186,000 (I)             | 75 (J)                                                                      | 120 (J)                                                 | 1,200 (J)                                  | 3,600 (J)                                     | 3,500 (J)                                     | 7,100 (J)                                                   | ND        | --      | ND        | --      | ND        | --      | ND        | --      | ND        | --      | ND        | --      | ND        | --      | ND        | --      |
| Other                      |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |           |         |           |         |           |         |           |         |           |         |           |         |           |         |           |         |
| CHLORIDE (mg/l)            | 16887-00-6 | 250,000 (E)                                      | 250,000 (E)                                         | 50 (FF)                                                      | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| NITROGEN (mg/l)            | 7727-37-9  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| HYDROCARBONS, TOTAL (mg/l) | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| Water Quality Parameters   |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |           |         |           |         |           |         |           |         |           |         |           |         |           |         |           |         |
| TEMPERATURE (°C)           | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| CONDUCTIVITY (mS/cm)       | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| DISSOLVED OXYGEN (%)       | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| pH                         | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| TURBIDITY (nTu)            | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 9-2  
Summary of Groundwater Analytical Results  
Area H  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Groundwater Table Footnotes:

- EGLE Part 201 residential and non-residential generic cleanup criteria and screening levels criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Release Date: December 30, 2013. Updated December 21, 2020.

- Only detected analytes are listed - Gray rows indicate requested analyses. If no analytes are listed below a gray row then all analytes of that group were either not analyzed or not detected.

- **Bold** values are concentrations detected above the laboratory reporting limit.

- **Bold/Shaded** cells indicate analyte concentration exceeded applicable criteria. EGLE Part 201 criteria exceeded is indicated by the footnote in [brackets] following the result value and defined below:

|                                                                                   |                                                    |
|-----------------------------------------------------------------------------------|----------------------------------------------------|
| [1] - Residential Drinking Water Criteria                                         | [8] Shallow Groundwater Residential MSSL           |
| [2] - Nonresidential Drinking Water Criteria                                      | [9] Shallow Groundwater Nonresidential MSSL        |
| [3] - Groundwater Surface Water Interface Criteria                                | [10] Groundwater Residential MSSL                  |
| [4] - Water Solubility                                                            | [11] Groundwater Residential TS MSSL               |
| [5] - Residential Groundwater Volatilization to Indoor Air Inhalation Criteria    | [12] Groundwater Nonresidential MSSL               |
| [6] - Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria | [13] Groundwater Nonresidential MSSL <sub>12</sub> |
| [7] - Flammability and Explosivity Screening Level                                | [14] Groundwater Nonresidential TS MSSL            |

Evaluation based on EGLE Criteria at time of Project completion.

|                                       |                                                                                                     |
|---------------------------------------|-----------------------------------------------------------------------------------------------------|
| -- = No Exceedances                   | mg/l = Milligrams per liter                                                                         |
| ND = Not Detected                     | °C = Degrees Celsius                                                                                |
| NM = Not Measured                     | mS/cm = MilliSiemens per centimeter                                                                 |
| bgs = Below ground surface            | % = Percentage                                                                                      |
| ft = Feet                             | nTu = Nephelometric Turbidity Unit                                                                  |
| PCBs = Polychlorinated biphenyls      | pH = pH acid-base scale                                                                             |
| SVOC = Semi-volatile organic compound | MSSL = Media-Specific Volatilization to Indoor Air Interim Action Screening Level                   |
| VOC = Volatile organic compound       | TS MSSL = Time Sensitive Media-Specific Volatilization to Indoor Air Interim Action Screening Level |
| ug/l = Micrograms per liter           |                                                                                                     |

Groundwater Table Footnotes:

ID = Insufficient data to develop criterion.

NA = A criterion or value is not available

NLV = Hazardous substance is not likely to volatilize under most conditions.

(A) = Criterion is the state of Michigan drinking water standard established pursuant to Section 5 of 1976 PA 399, MCL 325.1005.

(AA) = Use 10,000 ug/l where groundwater enters a structure through the use of a water well, sump or other device. Use 28,000 ug/l for all other uses.

(B) = Background, as defined in R 299.1(b), may be substituted if higher than the calculated cleanup criterion. Background levels may be less than criteria for some inorganic compounds.

(D) = Calculated criterion exceeds 100 percent, hence it is reduced to 100 percent or 1.0E+9 parts per billion (ppb).

(E) = Criterion is the aesthetic drinking water value, as required by Section 20120a(5) of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA). A notice of aesthetic impact may be employed as an institutional control mechanism if groundwater concentrations exceed the aesthetic drinking water criterion, but do not exceed the applicable health-based drinking water value provided in a table available on the Department of Environment, Great Lakes, and Energy (EGLE) internet web site. (See R 299.49 Footnotes for generic cleanup criteria tables for additional information)

(FF) = The chloride GSI criterion shall be 125 mg/l when the discharge is to surface waters of the state designated as public water supply sources or 50 mg/l when the discharge is to the Great Lakes or connecting waters. Chloride GSI criteria shall not apply for surface waters of the state that are not designated as a public water supply source, however, the total dissolved solids criterion is applicable.

(G) = Groundwater surface water interface (GSI) criterion depends on the pH or water hardness, or both, of the receiving surface water. The final chronic value (FCV) for the protection of aquatic life shall be calculated based on the pH or hardness of the receiving surface water. Where water hardness exceeds 400 mg CaCO<sub>3</sub>/L, use 400 mg CaCO<sub>3</sub>/L for the FCV calculation. The FCV formula provides values in units of ug/L or ppb. The generic GSI criterion is the lesser of the calculated FCV, the wildlife value (WV), and the surface water human non-drinking water value (HNDV). The soil GSI protection criteria for these hazardous substances are the greater of the 20 times the GSI criterion or the GSI soil-water partition values using the GSI criteria developed with the procedure described in this footnote. A spreadsheet that may be used to calculate GSI and GSI protection criteria for (G)-footnoted hazardous substances is available on the Department of Environment, Great Lakes, and Energy (EGLE) internet web site. A hardness value of 47.5 CaCO<sub>3</sub>/L and pH of 7, derived from the Michigan Department of Environmental Quality Draft Site Inspection Report for Lake Linden Operations dated 3/29/13, was used in the footnote G calculation spreadsheet.

(H) = Valence-specific chromium data (Cr III and Cr VI) shall be compared to the corresponding valence-specific cleanup criteria. If both Cr III and Cr VI are present in groundwater, the total concentration of both cannot exceed the drinking water criterion of 100 ug/L. If analytical data are provided for total chromium only, they shall be compared to the cleanup criteria for Cr VI. Cr III soil cleanup criterion for protection of drinking water can only be used at sites where groundwater is prevented from being used as a public water supply, currently and in the future, through an approved land or resource use restriction.

(HH) = The residential criterion for sodium is 230,000 ug/l in accordance with the Sodium Advisory Council recommendation and revised Groundwater Discharge Standards.

(I) = Hazardous substance may exhibit the characteristic of ignitability as defined in 40 C.F.R. §261.21 (revised as of July 1, 2001), which is adopted by reference in these rules and is available for inspection at EGLE, 525 West Allegan Street, Lansing, Michigan. Copies of the regulation may be purchased, at a cost as of the time of adoption of these rules of \$45, from the Superintendent of documents, Government Printing Office, Washington, DC 20401 (stock number 869-044-00155-1), or from the EGLE, Remediation and Redevelopment Division (RRD), 525 West Allegan Street, Lansing, Michigan 48933, at cost.

(J) = Hazardous substance may be present in several isomer forms. Isomer-specific concentrations shall be added together for comparison to criteria.

(L) = Criteria for lead are derived using a biologically based model, as allowed for under Section 20120a(9) of the NREPA, and are not calculated using the algorithms and assumptions specified in pathway-specific rules. The generic residential drinking water criterion of 4 ug/L is linked to the generic residential soil direct contact criterion of 400 mg/kg. A higher concentration in the drinking water, up to the state action level of 15 ug/L, may be allowed as a site-specific remedy and still allow for drinking water use, under Section 20120a(2) and 20120b of the NREPA if soil concentrations are appropriately lower than 400 mg/kg. If a site-specific criterion is approved based on this subdivision, a notice shall be filed on the deed for all property where the groundwater concentrations will exceed 4 ug/L to provide notice of the potential for unacceptable risk if soil or groundwater concentrations increase.

Acceptable combinations of site-specific soil and drinking water concentrations are presented in a table available on the Department of Environment, Great Lakes, and Energy (EGLE) internet web site (See R 299.49 Footnotes for generic cleanup criteria tables for additional information).

(M) = Calculated criterion is below the analytical target detection limit, therefore, the criterion defaults to the target detection limit.

(Q) = Criteria for carcinogenic polycyclic aromatic hydrocarbons were developed using relative potential potencies to benzo(a)pyrene.

(S) = Criterion defaults to the hazardous substance-specific water solubility limit.

(T) = Refer to the federal Toxic Substances Control Act (TSCA), 40 C.F.R. §761, Subpart D and 40 C.F.R. §761, Subpart G, to determine the applicability of TSCA cleanup standards. Subpart D and Subpart G of 40 C.F.R. §761 (July 1, 2001) are adopted by reference in these rules and are available for inspection at the EGLE, 525 West Allegan Street, Lansing, Michigan. Copies of the regulations may be purchased, at a cost as of the time of adoption of these rules of \$55, from the Superintendent of Documents, Government Printing Office, Washington, DC 20401, or from the EGLE, RRD, 525 West Allegan Street, Lansing, Michigan 48933, at cost. Alternatives to compliance with the TSCA standards listed below are possible under 40 C.F.R. §761 Subpart D. New releases may be subject to the standards identified in 40 C.F.R. §761, Subpart G. Use Part 201 soil direct contact cleanup criteria in the published table if TSCA standards are not applicable.

(X) = The GSI criterion shown in the generic cleanup criteria tables is not protective for surface water that is used as a drinking water source. (See R 299.49 Footnotes for generic cleanup criteria tables for additional information.)

(Z) = Mercury is typically measured as total mercury. The generic cleanup criteria, however, are based on data for different species of mercury. Specifically, data for elemental mercury, chemical abstract service (CAS) number 7439976, serve as the basis for the soil volatilization to indoor air criteria, groundwater volatilization to indoor air, and soil inhalation criteria. Data for methyl mercury, CAS number 22967926, serve as the basis for the GSI criterion; and data for mercuric chloride, CAS number 7487947, serve as the basis for the drinking water, groundwater contact, soil direct contact, and the groundwater protection criteria. Comparison to criteria shall be based on species-specific analytical data only if sufficient facility characterization has been conducted to rule out the presence of other species of mercury.

MSSL Footnotes:

GW = The calculated value for a hazardous substance based upon shallow groundwater is considered protective when it is greater than the calculated value for groundwater.

J = Hazardous substance may be present in several isomer forms. Isomer-specific concentrations must be added together for comparison to screening level.

JT = Hazardous substance may be present in several isomer forms. Screening levels may be used for the individual isomer provided that it is the sole isomer detected; however, when multiple isomers are detected in a medium, the isomer-specific concentrations must be added together and compared to the most restrictive screening level of the detected isomers.

Laboratory Footnotes:

U = Analyte analyzed for but not detected above the reported sample reporting limit.

**TABLE 9-2**  
**Summary of Groundwater Analytical Results**  
**Area H**  
**Quincy Mining Company Portage Operations Area**  
**Abandoned Mining Wastes - Torch Lake Non-Superfund Site**

|                                                                                                         | Part 201 Generic Cleanup Criteria Evaluated                                          | Exceedance |
|---------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|------------|
| <b>EGLE Part 201 Generic Cleanup Criteria<br/>(December 2020)</b>                                       | [1] Residential Drinking Water Criteria                                              | NO         |
|                                                                                                         | [2] Nonresidential Drinking Water Criteria                                           | NO         |
|                                                                                                         | [3] Groundwater Surface Water Interface Criteria                                     | YES        |
|                                                                                                         | [4] Residential Groundwater Volatilization to Indoor Air Inhalation Criteria         | NO         |
|                                                                                                         | [5] Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria      | NO         |
|                                                                                                         | [6] Water Solubility                                                                 | NO         |
|                                                                                                         | [7] Flammability and Explosivity Screening                                           | NO         |
| <b>Media-Specific Volatilization to Indoor Air<br/>Interim Action Screening Levels<br/>(March 2021)</b> | [8] Shallow Groundwater Residential Media-Specific Screening Level (MSSL)            | YES        |
|                                                                                                         | [9] Shallow Groundwater Nonresidential MSSL                                          | YES        |
|                                                                                                         | [10] Groundwater Residential MSSL                                                    | NO         |
|                                                                                                         | [11] Groundwater Residential Time Sensitive Media-Specific Screening Level (TS MSSL) | NO         |
|                                                                                                         | [12] Groundwater Nonresidential MSSL                                                 | NO         |
|                                                                                                         | [13] Groundwater Nonresidential MSSL <sub>12</sub>                                   | NO         |
|                                                                                                         | [14] Groundwater Nonresidential TS MSSL <sub>12</sub>                                | NO         |

## 10. DETAILED FINDINGS – AREA J

This Section summarizes the results and the subsequent findings for Area J within QMCP derived from implementation of the SAP. The narrative follows the systematic investigative approach outlined in **Section 3**, while providing specific details about the potential human health and ecological risks associated with the historical mining operations in this subarea of QMCP.

### 10.1 SITE INSPECTION AND INVESTIGATION RESULTS

The implementation of the site inspection and investigation activities provided critical lines of evidence that link the historical documentation and the current environmental conditions in and around the Portage Canal. The following subsections present the findings of the inspection and investigation activities and provide correlation of mining era operations and their potential impacts on the nearshore and offshore environment of the Portage Canal.

#### 10.1.1 Site Inspection

The site inspection at each subarea included the inventory and locating of historical structures and similar surficial artifacts associated with the former industrial operations in the area. Each subarea was also inspected for potential physical and health hazards that were documented, photographed, and located with a GPS unit. The inventoried hazards were then qualitatively assessed for potential human health and environmental risks to determine if analytical sampling was warranted during the targeted inspection phase of the work.

On September 26, 2018, MSG field team personnel performed reconnaissance activities at Area J. In the case where access was not requested based on historic operational and investigative findings, property conditions were evaluated from a neighboring property or public right of way where access was permitted. Access to Area J was not requested based on historic operational and investigative findings.

The property parcel known as the H&Y Marina totaling approximately 10 acres was visually inspected and observations were recorded from the MDNR public trail property. The qualitative assessment of the reconnaissance findings in Area J did not warrant the performance of targeted inspection activities. The following provides a summary of the findings associated with the reconnaissance activities. A copy of the reconnaissance log is provided in **Appendix C, Site Inspections – Reconnaissance Logs, Targeted Inspections & Physical Hazards Inventory**.

##### 10.1.1.1 Reconnaissance

The reconnaissance did not identify any potentially abandoned containers or other environmental concerns during the review of Area J that appeared to be associated with Area J. Therefore, the reconnaissance findings did not warrant the performance of limited targeted inspection activities.

#### 10.1.2 Site Investigation

The SI in the QMCP was developed based on a variety of data and information as outlined in **Section 3**. In addition to the historical accounts and documentation, current land use and potential exposure pathways were also taken into consideration when considering potential sampling locations. Due to this, along with findings associated with previous investigations, additional samples were not collected during SI activities in Area J. The following subsections present the outcomes of historic investigative activities completed in Area J by summarizing the laboratory analytical results and characterizing their impacts on the environmental media in which they were detected.



### 10.1.2.1 Historic Investigations

Following a review of available historic Sanborn Maps and other resources, historic land use and/or operations within Area J included Houghton Lumber Yard Co., Dollar Bay Lumber Co., Henry Borth Co. Manufacturing Railroad Shims, and UP Oil Company.

Organic and inorganic COCs in the study area were generally not understood due to the limited sampling that was conducted as part of previous investigations. Previous investigative activities did not fully characterize contaminants in soil and did not include groundwater sampling.

A detailed summary of soil analytical results collected from Area J are provided in **Table 10-1**, *Summary of Soil Analytical Results (Area J)*. Historic soil analytical results are depicted on **Figure 10-1**, *Soil Analytical Results (Area J)*.

## 10.2 NATURE AND EXTENT OF CONTAMINATION

Utilizing the established regulatory criteria presented in **Section 4** for various land use categories and exposure pathways, the historic laboratory analytical results summarized in the preceding section for Area J were reviewed and compared to EGLE Cleanup Criteria Requirements for Response Activity as applicable for the sampled environmental media.

### 10.2.1 Comprehensive Exposure Assessment

The comparison was completed to determine which ecological and human exposure pathways, risks, and conditions are relevant at Area J. Although not inclusive of relevant pathways where regulatory criteria were not exceeded, the following exposure pathways were determined to be relevant in Area J:

- Risks posed by hazardous substances in soil and the potential for the substances to leach to groundwater that could vent to surface water.
- Risks posed by hazardous substances in soil and the potential for the substances to be inhaled if they are emitted as particulates and dispersed in ambient air in both residential and nonresidential settings.
- Risks posed by hazardous substances in soil and the potential for direct contact with these soils in a residential setting.

As discussed in **Section 4.2.5**, EGLE drinking water and groundwater/surface water pathway criteria exceedances for metals were excluded from the soil and groundwater evaluation. The rationale for this exclusion is twofold:

- The Project investigation and anticipated response actions are being undertaken pursuant to Part 201 of NREPA, being PA 451 of 1994, as amended. The concentrations of metals in excess of the EGLE drinking water and groundwater/surface water pathway criteria are ubiquitous in the study area and are predominantly the result of the presence of stamp sands. Stamp sands are not defined as a hazardous substance nor are subject to regulation under Part 201 unless the property otherwise contains hazardous substances in excess of concentrations that satisfy the cleanup criteria for unrestricted residential use; and,
- The study area is part of OU 2 for which the EPA ROD remedy called for No Action. The EPA's ROD OU 2 includes groundwater, surface water, submerged tailings and sediments in Torch Lake, Portage Lake, the Portage Canal, and other area water bodies. Note that EPA's No Action determination relies on the following to mitigate the effects of stamp sand to the extent practicable:

- The reduction of stamp sand loading to surface water bodies expected as a result of the remedial action taken at OU 1 and OU 3.
- Ongoing natural sedimentation and detoxification.
- Institutional programs and practices controlling potential future exposure to site-affected drinking water which were intended to be administered at the county and state level.
- The long-term monitoring and the five-year review process monitoring requirements of the remedy selected for OU 1 and OU 3 under the 1992 ROD.

Note that metals criteria for other relevant pathways, and cyanide and organic contaminants for all pathways were included in the evaluation.

Furthermore, as discussed in **Section 4.2.5**, EGLE's MSSLs were not included in the exposure pathway assessment due to unknown anticipated future land use and conditions. The MSSLs were considered for screening and delineation purposes only.

#### *10.2.1.1 Soil Exposure Pathway Assessment*

Historical soil analytical results from Area J identified COC concentrations in soil that were at or above concentrations that trigger a "Facility" designation as defined in Section 20101(1)(s) of the NREPA. The following tables provide an aggregate summary of the soil sample locations with respect to the total number of samples and how they compare to the applicable EGLE Cleanup Criteria for Response Activity under both Residential and Nonresidential exposure scenarios. The tables are based solely on the total number of samples, inclusive of historical samples, collected from Area J. They list only the number of samples for a specific analytical suite that contained one or more exceedance of a given criterion.

| Soil Analytical Result Summary Table                                 | Cleanup Criteria Requirements for Response Activity – Residential** |                    |                    |                                                |                                                         |                                                       |                                                          |                                          |                                          |                                      |                         |                                                |
|----------------------------------------------------------------------|---------------------------------------------------------------------|--------------------|--------------------|------------------------------------------------|---------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------|------------------------------------------|------------------------------------------|--------------------------------------|-------------------------|------------------------------------------------|
|                                                                      | Analytical Summary                                                  |                    |                    | Groundwater Protection                         |                                                         | Indoor Air                                            | Ambient Air (Y)                                          |                                          |                                          |                                      | Contact                 | Csat                                           |
|                                                                      | Total Number of Samples                                             | Detected Analytes* | Total Exceedances* | Residential Drinking Water Protection Criteria | Groundwater Surface Water Interface Protection Criteria | Soil Volatilization to Indoor Air Inhalation Criteria | Infinite Source Volatile Soil Inhalation Criteria (VSIC) | Finite VSIC for 5 Meter Source Thickness | Finite VSIC for 2 Meter Source Thickness | Particulate Soil Inhalation Criteria | Direct Contact Criteria | Soil Saturation Concentration Screening Levels |
| Inorganics                                                           | 3                                                                   | 50                 | 3                  | NA*                                            | NA*                                                     | 0                                                     | 0                                                        | 0                                        | 0                                        | 1                                    | 1                       | 0                                              |
| Cyanide                                                              | 2                                                                   | 0                  | 0                  | 0                                              | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| VOCs                                                                 | 2                                                                   | 16                 | 1                  | 0                                              | 1                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| SVOCs                                                                | 2                                                                   | 13                 | 0                  | 0                                              | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Asbestos                                                             | 0                                                                   | 0                  | 0                  | 0                                              | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Total PCBs                                                           | 3                                                                   | 1                  | 0                  | 0                                              | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Pesticides                                                           | 2                                                                   | 2                  | 0                  | 0                                              | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| COCs exceeding applicable regulatory criteria in one or more samples |                                                                     |                    |                    | ARSENIC, LEAD, MANGANESE, NAPHTHALENE (VOC)    |                                                         |                                                       |                                                          |                                          |                                          |                                      |                         |                                                |

NA\* = The EGLE drinking water and groundwater/surface water interface pathway criteria exceedances for metals are excluded from the groundwater evaluation as explained in Section 4.2.5.

\*Denotes total number of specific instances of an analyte being detected or exceeding criteria, can be multiple within one sample location.

\*\*Denotes total number of samples exceeding criteria, cannot be multiple within one sample location.

Total exceedance column does not include MSSLS or non-applicable criteria (DWPC and GSIPC for metals).

(Y) Source size modifiers listed below shall be used to determine soil inhalation criteria for ambient air when the source size is not one-half acre. The modifier shall be multiplied by the generic soil inhalation criteria shown in the table of generic cleanup criteria to determine the applicable criterion. Source Size square feet (sqft) or acres: Modifier 400 sqft 3.17, 1000 sqft 2.2, 2000 sqft 1.76, 1/4 acre 1.15, 1/2 acre 1, 1 acre 0.87, 2 acre 0.77, 5 acre 0.66, 10 acre 0.6, 32 acre 0.5, 100 acre 0.43.

| Soil Analytical Result Summary Table                                 | Cleanup Criteria Requirements for Response Activity – Nonresidential** |                    |                    |                                                   |                                                         |                                                       |                                                          |                                          |                                          |                                      |                         |                                                |
|----------------------------------------------------------------------|------------------------------------------------------------------------|--------------------|--------------------|---------------------------------------------------|---------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------|------------------------------------------|------------------------------------------|--------------------------------------|-------------------------|------------------------------------------------|
|                                                                      | Analytical Summary                                                     |                    |                    | Groundwater Protection                            |                                                         | Indoor Air                                            | Ambient Air (Y)                                          |                                          |                                          |                                      | Contact                 | Csat                                           |
|                                                                      | Total Number of Samples                                                | Detected Analytes* | Total Exceedances* | Nonresidential Drinking Water Protection Criteria | Groundwater Surface Water Interface Protection Criteria | Soil Volatilization to Indoor Air Inhalation Criteria | Infinite Source Volatile Soil Inhalation Criteria (VSIC) | Finite VSIC for 5 Meter Source Thickness | Finite VSIC for 2 Meter Source Thickness | Particulate Soil Inhalation Criteria | Direct Contact Criteria | Soil Saturation Concentration Screening Levels |
| Inorganics                                                           | 3                                                                      | 50                 | 1                  | NA*                                               | NA*                                                     | 0                                                     | 0                                                        | 0                                        | 0                                        | 1                                    | 0                       | 0                                              |
| Cyanide                                                              | 2                                                                      | 0                  | 0                  | 0                                                 | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| VOCs                                                                 | 2                                                                      | 16                 | 1                  | 0                                                 | 1                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| SVOCs                                                                | 2                                                                      | 13                 | 0                  | 0                                                 | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Asbestos                                                             | 0                                                                      | 0                  | 0                  | 0                                                 | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Total PCBs                                                           | 3                                                                      | 1                  | 0                  | 0                                                 | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Pesticides                                                           | 2                                                                      | 2                  | 0                  | 0                                                 | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| COCs exceeding applicable regulatory criteria in one or more samples |                                                                        |                    |                    | MANGANESE, NAPHTHALENE (VOC)                      |                                                         |                                                       |                                                          |                                          |                                          |                                      |                         |                                                |

NA\* = The EGLE drinking water and groundwater/surface water interface pathway criteria exceedances for metals are excluded from the groundwater evaluation as explained in Section 4.2.5.

\*Denotes total number of specific instances of an analyte being detected or exceeding criteria, can be multiple within one sample location.

\*\*Denotes total number of samples exceeding criteria, cannot be multiple within one sample location.

Total exceedance column does not include MSSLS or non-applicable criteria (DWPC and GSIPC for metals).

(Y) Source size modifiers listed below shall be used to determine soil inhalation criteria for ambient air when the source size is not one-half acre. The modifier shall be multiplied by the generic soil inhalation criteria shown in the table of generic cleanup criteria to determine the applicable criterion. Source Size square feet (sqft) or acres: Modifier 400 sqft 3.17, 1000 sqft 2.2, 2000 sqft 1.76, 1/4 acre 1.15, 1/2 acre 1, 1 acre 0.87, 2 acres 0.77, 5 acres 0.66, 10 acre 0.6, 32 acres 0.5, 100 acres 0.43.

## 10.2.2 Extent of Contamination

The comparison of historic analytical results to applicable regulatory criteria indicates that potential human health and ecological risks are present in soil in Area J. Recalling the goals and objectives of the SI, the following subsections describe the extent of contamination in environmental media in the study area.

### 10.2.2.1 Soil Extent of Contamination

Drawing upon historic analytical data only, soil analytical results exceeded GSIPC, residential DCC, residential and nonresidential MSSLS, and PSIC in both residential and nonresidential exposure scenarios. The predominant contaminants were inorganic compounds, with manganese exceeding residential and nonresidential PSIC at sample location H&Y Marina-19 in the western portion of Area J. Arsenic and lead were detected above residential DCC and PCBs were also detected at this sample location but did not exceed criteria. Additionally, VOCs at concentrations above GSIPC and residential and/or nonresidential MSSLS were detected at sample location SS-30 on the MDNR trail

property in the eastern portion of Area J. The limits of inorganic and VOC impact, respectively, at these two locations have not been defined.

All samples were collected from surface soil intervals that are generally accessible to the public despite being a privately-owned property. The sampling locations were within approximately 75 ft to 350 ft of the shoreline of the Portage Canal.

In the case of Area J, elevated concentrations of inorganic and VOC contaminants potentially include exposure risks related to inhalation and dermal contact pathways, which must be a consideration when evaluating land use, property accessibility, and the extent of contamination in surface and near surface soils that could be encountered through normal use of the property.

The remaining exposure risks are generally related to the leaching of contaminants to groundwater and their potential impacts on surface water; however, as stated before, VOC contaminants have not been fully investigated. These risks pose a long-term threat to the overall environmental health of the watershed. The widespread distribution of inorganic COCs throughout the region limit determinations related to the extent of contamination in Area J. Nevertheless, risks posed to groundwater and surface water are relevant and are a factor when evaluating the extent of soil contamination in the Area J.

### **10.3 CONCLUSIONS AND RECOMMENDATIONS**

The analytical results and interpretation summarized in the preceding subsections document potential human health and ecological risks that are present in Area J. The following subsections provide a synopsis of these findings and a recommended path forward for mitigating these risks in Area J.

#### **10.3.1 Conclusions**

Environmental impacts in Area J are generally characterized by detections of organic and inorganic contaminants in soil. Groundwater has not been sampled in Area J. Although specific sources of these contaminants may not be fully understood, historical research related to the operations provided substantive evidence for assessing specific operational areas and selecting target analytes anticipated to be present within the study area.

The historic analytical results summarized above provide sufficient analytical data and lines of evidence to conclude that the study area is a "Facility" as defined in Section 20101(1)(s) of the NREPA. The following table provides a summary of the affected environmental media, applicable regulatory criteria, and potential receptors within Area J.

| Area J – Media, Criteria, Potential Receptor Summary                |                           |                                     |                |                                             |                                     |                              |                |                        |            |               |              |                                                        |                              |               |
|---------------------------------------------------------------------|---------------------------|-------------------------------------|----------------|---------------------------------------------|-------------------------------------|------------------------------|----------------|------------------------|------------|---------------|--------------|--------------------------------------------------------|------------------------------|---------------|
| Media                                                               | Soil                      |                                     |                | Groundwater                                 |                                     |                              | Air            |                        | Sediment   | Surface Water |              | Building Materials, Asbestos, and Abandoned Containers |                              |               |
| Criteria                                                            | Drinking Water Protection | Groundwater Surface Water Interface | Direct Contact | Drinking Water Protection                   | Groundwater Surface Water Interface | Flammability and Explosivity | Volatilization | Particulate Inhalation | Ecological | Ecological    | Human Health | Particulate Inhalation                                 | Flammability and Explosivity | Environmental |
| Potential Receptor                                                  |                           |                                     |                |                                             |                                     |                              |                |                        |            |               |              |                                                        |                              |               |
| Residential Human                                                   |                           | ✓                                   | ✓              |                                             |                                     |                              |                | ✓                      |            |               |              |                                                        |                              |               |
| Nonresidential Human                                                |                           | ✓                                   |                |                                             |                                     |                              |                | ✓                      |            |               |              |                                                        |                              |               |
| Water Column Organism                                               |                           |                                     |                |                                             |                                     |                              |                |                        |            |               |              |                                                        |                              |               |
| Benthic Organism                                                    |                           |                                     |                |                                             |                                     |                              |                |                        |            |               |              |                                                        |                              |               |
| COCs exceeding applicable regulatory criteria in one or more sample |                           |                                     |                | ARSENIC, LEAD, MANGANESE, NAPHTHALENE (VOC) |                                     |                              |                |                        |            |               |              |                                                        |                              |               |

In addition to the evaluation of historical analytical results evaluated from Area J, the following provides a summary of findings derived from the assessment of Area J with respect to the goals and objectives for the Project:

- Terrestrial sources of contamination are present in the form of VOCs and inorganic COCs in the study area. Based on the availability of historic analytical data, the extent of contamination in Area J does not appear to have been fully investigated.
- Soil impacts on the MDNR trail property exceeded GSIPC and MSSSLs for residential and nonresidential scenarios but did not exceed PSIC or DCC.

### 10.3.2 Recommendations

The conclusions outlined in the preceding subsection establish that Area J is a Part 201 Facility. Section 20107a of Part 201 of NREPA describes the duties of owners or operators of a Facility, regardless of their liability, including: prevent unacceptable exposures, prevent exacerbation, and take reasonable precautions against the foreseeable actions of third parties. Some exceptions may apply; in any case, owners and operators of contaminated properties should become familiar with Section 20107a and the associated Rules.



## FIGURES

### DETAILED FINDINGS REPORT – AREA J





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## TABLES

### DETAILED FINDINGS REPORT – AREA J



TABLE 10-1  
Summary of Soil Analytical Results  
Area J  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code                |            | EGLE Part 201 Generic Cleanup Criteria                                     |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                        | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels                                                                                  |          | Area J                                                                                                                                                   |          |                   |               |  |  |
|------------------------------|------------|----------------------------------------------------------------------------|-------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------------------|----------------------------------------------------------------------|------------------------------------------------------|----------------------------------|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-------------------|---------------|--|--|
| Station Name                 | CAS Number | [2]<br>Groundwater<br>Surface Water<br>Interface<br>Protection<br>Criteria | [4]<br>Residential<br>Drinking<br>Water<br>Protection<br>Criteria | [5]<br>Residential<br>Soil<br>Volatilization<br>to Indoor Air<br>Inhalation<br>Criteria<br>(VSIC) | [9]<br>Residential<br>Particulate<br>Soil Inhalation<br>Criteria | [10]<br>Residential<br>Direct<br>Contact<br>Criteria | [11]<br>Nonresidential<br>Drinking Water<br>Protection<br>Criteria | [16]<br>Nonresidential<br>Particulate<br>Soil Inhalation<br>Criteria | [17]<br>Nonresidential<br>Direct Contact<br>Criteria | [18]<br>Soil Residential<br>MSSL | [19]<br>Soil<br>Nonresidential<br>MSSL | SS-29                                                                                                                                                        |          | SS-30                                                                                                                                                    |          | H&Ymarina-19      |               |  |  |
| Field Sample ID              |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                        | SS 29                                                                                                                                                        |          | SS 30                                                                                                                                                    |          | H & Y Marina B-19 |               |  |  |
| Sample Date                  |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                        | 6/5/2002                                                                                                                                                     |          | 6/5/2002                                                                                                                                                 |          | 9/12/2007         |               |  |  |
| Sample Interval (bgs)        |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                        | 0 - 4 in<br>0 - 12 in                                                                                                                                        |          | 0 - 4 in<br>0 - 12 in                                                                                                                                    |          | 0 - 0 ft          |               |  |  |
| Sample Description           |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                        | 0-½" - Root zone, slightly moist with surface dark brown stamp sand. ½-4" - Slightly moist, dark red, medium sand, with pieces of coal and some fine gravel. |          | 0-½" - Dry, dark brown and black medium to coarse sand with about 30% stamp sand. ½-4" - Slightly moist, dark brown, medium sand with coarse stamp sand. |          | --                |               |  |  |
|                              |            | Result                                                                     | Exceeds                                                           | Result                                                                                            | Exceeds                                                          | Result                                               | Exceeds                                                            |                                                                      |                                                      |                                  |                                        |                                                                                                                                                              |          |                                                                                                                                                          |          |                   |               |  |  |
| Inorganics - Metals (mg/kg)  |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                        |                                                                                                                                                              |          |                                                                                                                                                          |          |                   |               |  |  |
| ALUMINIUM                    | 7429-90-5  | NA                                                                         | 6900 (B)                                                          | NLV                                                                                               | ID                                                               | 50,000 (D,BB)                                        | 6,900 (B)                                                          | ID                                                                   | 3.7E+5 (D,BB)                                        | NA                               | NA                                     | 5,560                                                                                                                                                        | --       | 20,200                                                                                                                                                   | [4,11]   | 1,800 J           | --            |  |  |
| ANTIMONY                     | 7440-36-0  | 1.2 (X)                                                                    | 4.3                                                               | NLV                                                                                               | 13,000                                                           | 180                                                  | 4.3                                                                | 5,900                                                                | 670                                                  | NA                               | NA                                     | 1.8 J                                                                                                                                                        | [2]      | <0.8 UJ                                                                                                                                                  | --       | NM                | --            |  |  |
| ARSENIC                      | 7440-38-2  | 4.6                                                                        | 4.6                                                               | NLV                                                                                               | 720                                                              | 7.6                                                  | 4.6                                                                | 910                                                                  | 37                                                   | NA                               | NA                                     | 4.8                                                                                                                                                          | [2,4,11] | 6.4                                                                                                                                                      | [2,4,11] | 30 J              | [2,4,10,11]   |  |  |
| BARIUM                       | 7440-39-3  | 130 (B,G)                                                                  | 1,300 (B)                                                         | NLV                                                                                               | 3.3E+5 (B)                                                       | 37,000 (B)                                           | 1,300 (B)                                                          | 1.5E+5 (B)                                                           | 1.3E+5 (B)                                           | NA                               | NA                                     | 23.7                                                                                                                                                         | --       | 10.6                                                                                                                                                     | --       | NM                | --            |  |  |
| BERYLLIUM                    | 7440-41-7  | 24 (G)                                                                     | 51                                                                | NLV                                                                                               | 1,300                                                            | 410                                                  | 51                                                                 | 590                                                                  | 1,600                                                | NA                               | NA                                     | 0.12                                                                                                                                                         | --       | 0.16                                                                                                                                                     | --       | <3.4 UJ           | --            |  |  |
| CADMIUM                      | 7440-43-9  | 1.6 (B,G,X)                                                                | 6.0 (B)                                                           | NLV                                                                                               | 1,700 (B)                                                        | 550 (B)                                              | 6.0 (B)                                                            | 2,200 (B)                                                            | 2,100 (B)                                            | NA                               | NA                                     | 0.19                                                                                                                                                         | --       | 0.12                                                                                                                                                     | --       | NM                | --            |  |  |
| CALCIUM                      | 7440-70-2  | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                     | 3,070                                                                                                                                                        | --       | 30,000                                                                                                                                                   | --       | NM                | --            |  |  |
| CHROMIUM                     | 7440-47-3  | 1.2E+6 (B,G,H,X)                                                           | 1.0E+6 (B,D,H)                                                    | NLV                                                                                               | 3.30E+8 (B,H)                                                    | 7.90E+5 (B,H)                                        | 1.00E+6 (B,D,H)                                                    | 1.50E+5 (B,H)                                                        | 1.00E+6 (B,D,H)                                      | NA                               | NA                                     | 10.9                                                                                                                                                         | --       | 52.5                                                                                                                                                     | --       | 460 J             | --            |  |  |
| COBALT                       | 7440-48-4  | 2                                                                          | 0.8                                                               | NLV                                                                                               | 13,000                                                           | 2,600                                                | 2                                                                  | 5,900                                                                | 9,000                                                | NA                               | NA                                     | 7.7                                                                                                                                                          | [2,4,11] | 24.3                                                                                                                                                     | [2,4,11] | 37 J              | [2,4,11]      |  |  |
| COPPER                       | 7440-50-8  | 32 (B,G)                                                                   | 5,800 (B)                                                         | NLV                                                                                               | 130,000 (B)                                                      | 20,000 (B)                                           | 5,800 (B)                                                          | 59,000 (B)                                                           | 73,000 (B)                                           | NA                               | NA                                     | 435 J                                                                                                                                                        | [2]      | 1,100 J                                                                                                                                                  | [2]      | 470 J             | [2]           |  |  |
| IRON                         | 7439-89-6  | --                                                                         | 12,000 (B)                                                        | NLV                                                                                               | ID                                                               | 160,000 (B)                                          | 12,000 (B)                                                         | ID                                                                   | 580,000 (B)                                          | NA                               | NA                                     | 15,300                                                                                                                                                       | [4,11]   | 23,700                                                                                                                                                   | [4,11]   | NM                | --            |  |  |
| LEAD                         | 7439-92-1  | 2,500 (B,G,X)                                                              | 700 (B)                                                           | NLV                                                                                               | 100,000 (B)                                                      | 400 (B)                                              | 700 (B)                                                            | 44,000 (B)                                                           | 900 (B,DD)                                           | NA                               | NA                                     | 53.6 J                                                                                                                                                       | --       | 7.2 J                                                                                                                                                    | --       | 440 J             | [10]          |  |  |
| LITHIUM                      | 7439-93-2  | 9.8 (B)                                                                    | 9.8 (B)                                                           | NLV                                                                                               | 2.30E+9 (B)                                                      | 4,200 (B,DD)                                         | 9.8 (B)                                                            | 1.00E+6 (B)                                                          | 31,000 (B,DD)                                        | NA                               | NA                                     | NM                                                                                                                                                           | --       | NM                                                                                                                                                       | --       | 0.74              | --            |  |  |
| MAGNESIUM                    | 7439-95-4  | --                                                                         | 8,000 (B)                                                         | NLV                                                                                               | 6.70E+6 (B)                                                      | 1.0E+9 (B,D)                                         | 22,000 (B)                                                         | 2.90E+6 (B)                                                          | 1.00E+6 (B,D)                                        | NA                               | NA                                     | 3,250                                                                                                                                                        | --       | 19,700                                                                                                                                                   | [4]      | NM                | --            |  |  |
| MANGANESE                    | 7439-96-5  | 440 (B,G,X)                                                                | 440 (B)                                                           | NLV                                                                                               | 3,300 (B)                                                        | 25,000 (B)                                           | 440 (B)                                                            | 1,500 (B)                                                            | 90,000 (B)                                           | NA                               | NA                                     | 195                                                                                                                                                          | --       | 630                                                                                                                                                      | [2,4,11] | 5,500             | [2,4,9,11,16] |  |  |
| MERCURY                      | 7439-97-6  | 0.13 (B,Z)                                                                 | 1.7 (B,Z)                                                         | 48 (B,Z)                                                                                          | 20,000 (B,Z)                                                     | 160 (B,Z)                                            | 1.7 (B,Z)                                                          | 8,800 (B,Z)                                                          | 580 (B,Z)                                            | 0.022 (M)                        | 0.066                                  | <0.06 UJ                                                                                                                                                     | --       | <0.05 UJ                                                                                                                                                 | --       | 0.0099 J          | --            |  |  |
| NICKEL                       | 7440-02-0  | 29 (G)                                                                     | 100 (B)                                                           | NLV                                                                                               | 13,000 (B)                                                       | 40,000 (B)                                           | 100 (B)                                                            | 16,000 (B)                                                           | 1.50E+5 (B)                                          | NA                               | NA                                     | 15.4                                                                                                                                                         | --       | 59.4                                                                                                                                                     | [2]      | 250 J             | [2,4,11]      |  |  |
| POTASSIUM                    | 7440-09-7  | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                     | 272 J                                                                                                                                                        | --       | 266 J                                                                                                                                                    | --       | NM                | --            |  |  |
| SELENIUM                     | 7782-49-2  | 0.41 (B)                                                                   | 4.0 (B)                                                           | NLV                                                                                               | 130,000 (B)                                                      | 2,600 (B)                                            | 4.0 (B)                                                            | 59,000 (B)                                                           | 9,600 (B)                                            | NA                               | NA                                     | 0.64 J                                                                                                                                                       | [2]      | <0.46 UJ                                                                                                                                                 | --       | NM                | --            |  |  |
| SILVER                       | 7440-22-4  | 1.0 (B,M)                                                                  | 4.5 (B)                                                           | NLV                                                                                               | 6700 (B)                                                         | 2500 (B)                                             | 13 (B)                                                             | 2,900 (B)                                                            | 9,000 (B)                                            | NA                               | NA                                     | <0.27 U                                                                                                                                                      | --       | <0.23 U                                                                                                                                                  | --       | 0.38 J            | --            |  |  |
| SODIUM                       | 7440-23-5  | NA                                                                         | 4,600                                                             | NLV                                                                                               | ID                                                               | 1.0E+6 (D)                                           | NA                                                                 | ID                                                                   | 1.0E+6 (D)                                           | NA                               | NA                                     | 557 J                                                                                                                                                        | --       | 534 J                                                                                                                                                    | --       | NM                | --            |  |  |
| VANADIUM                     | 7440-62-2  | 430                                                                        | 72                                                                | NLV                                                                                               | ID                                                               | 750 (DD)                                             | 990                                                                | ID                                                                   | 5,500 (DD)                                           | NA                               | NA                                     | 24.9                                                                                                                                                         | --       | 57.4                                                                                                                                                     | --       | NM                | --            |  |  |
| ZINC                         | 7440-66-6  | 62 (B,G)                                                                   | 2,400 (B)                                                         | NLV                                                                                               | ID                                                               | 1.70E+5 (B)                                          | 5,000 (B)                                                          | ID                                                                   | 6.30E+5 (B)                                          | NA                               | NA                                     | 38.6 J                                                                                                                                                       | --       | 50.9 J                                                                                                                                                   | --       | 83                | [2]           |  |  |
| Inorganics - Cyanide (mg/kg) |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                        |                                                                                                                                                              |          |                                                                                                                                                          |          |                   |               |  |  |
| CYANIDE                      | 57-12-5    | 0.1 (P,R)                                                                  | 4.0 (P,R)                                                         | NLV                                                                                               | 250 (P,R)                                                        | 12 (P,R)                                             | 4.0 (P,R)                                                          | 250 (P,R)                                                            | 250 (P,R)                                            | NA                               | NA                                     | <0.04 UJ                                                                                                                                                     | --       | <0.04 UJ                                                                                                                                                 | --       | NM                | --            |  |  |
| Organics - PCBs (ug/kg)      |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                        |                                                                                                                                                              |          |                                                                                                                                                          |          |                   |               |  |  |
| AROCLOR-1260                 | 11096-82-5 | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                     | <39 U                                                                                                                                                        | --       | <36 U                                                                                                                                                    | --       | <36 U             | --            |  |  |
| AROCLOR-1262                 | 37324-23-5 | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                     | NM                                                                                                                                                           | --       | NM                                                                                                                                                       | --       | 11 J              | --            |  |  |
| TOTAL PCBs                   | 1336-36-6  | NLL                                                                        | NLL                                                               | 3.00E+6 (J,T)                                                                                     | 5.20E+6 (J,T)                                                    | 1,000 (J,T)                                          | NLL                                                                | 6.50E+6 (J,T)                                                        | 1,000 (J,T)                                          | NA                               | NA                                     | ND                                                                                                                                                           | --       | ND                                                                                                                                                       | --       | 11 J              | --            |  |  |
| Organics - SVOCs (ug/kg)     |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                        |                                                                                                                                                              |          |                                                                                                                                                          |          |                   |               |  |  |
| 1,1-BIPHENYL                 | 92-52-4    | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                     | <1900 U                                                                                                                                                      | --       | <1800 U                                                                                                                                                  | --       | NM                | --            |  |  |
| 2-METHYLNAPHTHALENE (SVOC)   | 91-57-6S   | 4,200                                                                      | 57,000                                                            | 2.70E+06                                                                                          | 6.70E+08                                                         | 8.10E+06                                             | 1.70E+05                                                           | 2.90E+08                                                             | 2.60E+07                                             | NA                               | NA                                     | 790 J                                                                                                                                                        | --       | 280 J                                                                                                                                                    | --       | NM                | --            |  |  |
| ACENAPHTHENE                 | 83-32-9    | 8,700                                                                      | 3.00E+05                                                          | 1.90E+08                                                                                          | 1.40E+10                                                         | 4.10E+07                                             | 8.80E+05                                                           | 6.20E+09                                                             | 1.30E+08                                             | NA                               | NA                                     | <1900 U                                                                                                                                                      | --       | <1800 U                                                                                                                                                  | --       | NM                | --            |  |  |
| ACENAPHTHYLENE               | 208-96-8   | ID                                                                         | 5,900                                                             | 1.60E+06                                                                                          | 2.30E+09                                                         | 1.60E+06                                             | 17,000                                                             | 1.00E+09                                                             | 5.20E+06                                             | NA                               | NA                                     | <1900 U                                                                                                                                                      | --       | <1800 U                                                                                                                                                  | --       | NM                | --            |  |  |
| ACETOPHENONE                 | 98-86-2    | ID                                                                         | 30,000                                                            | 1.20E+8 (C)                                                                                       | 3.30E+10                                                         | 4.70E+7 (C)                                          | 88,000                                                             | 1.40E+10                                                             | 1.50E+8 (C)                                          | NA                               | NA                                     | <1900 U                                                                                                                                                      | --       | <1800 U                                                                                                                                                  | --       | NM                | --            |  |  |
| ANTHRACENE                   | 120-12-7   | ID                                                                         | 41,000                                                            | 1.00E+9 (D)                                                                                       | 6.70E+10                                                         | 2.30E+08                                             | 41,000                                                             | 2.90E+10                                                             | 7.30E+08                                             | NA                               | NA                                     | <1900 U                                                                                                                                                      | --       | <1800 U                                                                                                                                                  | --       | NM                | --            |  |  |
| BENZALDEHYDE                 | 100-52-7   | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                     | <1900 U                                                                                                                                                      | --       | <1800 U                                                                                                                                                  | --       | NM                | --            |  |  |
| BENZO(A)ANTHRACENE           | 56-55-3    | NLL                                                                        | NLL                                                               | NLV                                                                                               | ID                                                               | 20,000 (Q)                                           | NLL                                                                | ID                                                                   | 80,000 (Q)                                           | NA                               | NA                                     | <1900 U                                                                                                                                                      | --       | <1800 U                                                                                                                                                  | --       | NM                | --            |  |  |
| BENZO(A)PYRENE               | 50-32-8    | NLL                                                                        | NLL                                                               | NLV                                                                                               | 1.50E+8 (Q)                                                      | 2,000 (Q)                                            | NLL                                                                | 1.90E+6 (Q)                                                          | 8,000 (Q)                                            | NA                               | NA                                     | <1900 U                                                                                                                                                      | --       | <1800 U                                                                                                                                                  | --       | NM                | --            |  |  |
| BENZO(B)FLUORANTHENE         | 205-99-2   | NLL                                                                        | NLL                                                               | ID                                                                                                | ID                                                               | 20,000 (Q)                                           | NLL                                                                | ID                                                                   | 80,000 (Q)                                           | NA                               | NA                                     | <1900 U                                                                                                                                                      | --       | <1800 U                                                                                                                                                  | --       | NM                | --            |  |  |
| BENZO(G,H,I)PERYLENE         | 191-24-2   | NLL                                                                        | NLL                                                               | NLV                                                                                               | 8.00E+08                                                         | 2.50E+06                                             | NLL                                                                | 3.50E+08                                                             | 7.00E+06                                             | NA                               | NA                                     | <1900 U                                                                                                                                                      | --       | <1800 U                                                                                                                                                  | --       | NM                | --            |  |  |
| BENZO(K)FLUORANTHENE         | 207-08-9   | NLL                                                                        | NLL                                                               | NLV                                                                                               | ID                                                               | 2.00E+5 (Q)                                          | NLL                                                                | ID                                                                   | 8.00E+5 (Q)                                          | NA                               | NA                                     | <1900 U                                                                                                                                                      | --       | <1800 U                                                                                                                                                  | --       | NM                | --            |  |  |
| BIS(2-ETHYLHEXYL)PHTHALATE   | 117-81-7   | NLL                                                                        | NLL                                                               | NLV                                                                                               | 7.00E+08                                                         | 2.80E+06                                             | NLL                                                                | 8.90E+08                                                             | 1.20E+7 (C)                                          | NA                               | NA                                     | <1900 U                                                                                                                                                      | --       | 210 J                                                                                                                                                    | --       | NM                | --            |  |  |
| BUTYL BENZYL PHTHALATE       | 85-68-7    | 13,000 (X)                                                                 | 2.20E+6 (C)                                                       | NLV                                                                                               | 4.70E+10                                                         | 3.60E+10 (C)                                         | 5.00E+6 (C)                                                        | 2.10E+10                                                             | 1.20E+8 (C)                                          | NA                               | NA                                     | <1900 U                                                                                                                                                      | --       | <1800 U                                                                                                                                                  | --       | NM                | --            |  |  |
| CHRYSENE                     | 218-01-9   | NLL                                                                        | NLL                                                               | ID                                                                                                | ID                                                               | 2.00E+6 (Q)                                          | NLL                                                                | ID                                                                   | 8.00E+6 (Q)                                          | NA                               | NA                                     | 250 J                                                                                                                                                        | --       | <1800 U                                                                                                                                                  | --       | NM                | --            |  |  |

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 10-1  
Summary of Soil Analytical Results  
Area J  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code                      |            | EGLE Part 201 Generic Cleanup Criteria                                     |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                                                                                                                                              | Area J |                                                                                                                                                          |         |                   |    |  |
|------------------------------------|------------|----------------------------------------------------------------------------|-------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------------------|----------------------------------------------------------------------|------------------------------------------------------|----------------------------------|-----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-------------------|----|--|
| Station Name                       | CAS Number | [2]<br>Groundwater<br>Surface Water<br>Interface<br>Protection<br>Criteria | [4]<br>Residential<br>Drinking<br>Water<br>Protection<br>Criteria | [5]<br>Residential<br>Soil<br>Volatilization<br>to Indoor Air<br>Inhalation<br>Criteria<br>(VSIC) | [9]<br>Residential<br>Particulate<br>Soil Inhalation<br>Criteria | [10]<br>Residential<br>Direct<br>Contact<br>Criteria | [11]<br>Nonresidential<br>Drinking Water<br>Protection<br>Criteria | [16]<br>Nonresidential<br>Particulate<br>Soil Inhalation<br>Criteria | [17]<br>Nonresidential<br>Direct Contact<br>Criteria | [18]<br>Soil Residential<br>MSSL | [19]<br>Soil<br>Nonresidential<br>MSSL                                      | SS-29                                                                                                                                                        |        | SS-30                                                                                                                                                    |         | H&Ymarina-19      |    |  |
| Field Sample ID                    |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | SS 29                                                                                                                                                        |        | SS 30                                                                                                                                                    |         | H & Y Marina B-19 |    |  |
| Sample Date                        |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | 6/5/2002                                                                                                                                                     |        | 6/5/2002                                                                                                                                                 |         | 9/12/2007         |    |  |
| Sample Interval (bgs)              |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | 0 - 4 in<br>0 - 12 in                                                                                                                                        |        | 0 - 4 in<br>0 - 12 in                                                                                                                                    |         | 0 - 0 ft          |    |  |
| Sample Description                 |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | 0-½" - Root zone, slightly moist with surface dark brown stamp sand. ½-4" - Slightly moist, dark red, medium sand, with pieces of coal and some fine gravel. |        | 0-½" - Dry, dark brown and black medium to coarse sand with about 30% stamp sand. ½-4" - Slightly moist, dark brown, medium sand with coarse stamp sand. |         | --                |    |  |
|                                    |            | Result                                                                     | Exceeds                                                           | Result                                                                                            | Exceeds                                                          | Result                                               | Exceeds                                                            |                                                                      |                                                      |                                  |                                                                             |                                                                                                                                                              |        |                                                                                                                                                          |         |                   |    |  |
| Organics - SVOCs (ug/kg) Continued |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |                                                                                                                                                              |        |                                                                                                                                                          |         |                   |    |  |
| DIBENZO(A,H)ANTHRACENE             | 53-70-3    | NLL                                                                        | NLL                                                               | NLV                                                                                               | ID                                                               | 2,000 (Q)                                            | NLL                                                                | ID                                                                   | 8,000 (Q)                                            | NA                               | NA                                                                          | <1900 U                                                                                                                                                      | --     | <1800 U                                                                                                                                                  | --      | NM                | -- |  |
| DIBENZOFURAN                       | 132-64-9   | 1,700                                                                      | ID                                                                | 2.00E+06                                                                                          | 6.70E+06                                                         | ID                                                   | ID                                                                 | 2.90E+06                                                             | ID                                                   | NA                               | NA                                                                          | 220 J                                                                                                                                                        | --     | <1800 U                                                                                                                                                  | --      | NM                | -- |  |
| FLUORANTHENE                       | 206-44-0   | 5,500                                                                      | 730,000                                                           | 1.00E+9 (D)                                                                                       | 9.30E+09                                                         | 4.60E+07                                             | 730,000                                                            | 4.10E+09                                                             | 1.30E+08                                             | NA                               | NA                                                                          | 280 J                                                                                                                                                        | --     | 210 J                                                                                                                                                    | --      | NM                | -- |  |
| FLUORENE                           | 86-73-7    | 5,300                                                                      | 390,000                                                           | 5.80E+08                                                                                          | 9.30E+09                                                         | 2.70E+07                                             | 890,000                                                            | 4.10E+09                                                             | 8.70E+07                                             | NA                               | NA                                                                          | <1900 U                                                                                                                                                      | --     | <1800 U                                                                                                                                                  | --      | NM                | -- |  |
| INDENO(1,2,3-CD)PYRENE             | 193-39-5   | NLL                                                                        | NLL                                                               | NLV                                                                                               | ID                                                               | 20,000 (Q)                                           | NLL                                                                | ID                                                                   | 80,000 (Q)                                           | NA                               | NA                                                                          | <1900 U                                                                                                                                                      | --     | <1800 U                                                                                                                                                  | --      | NM                | -- |  |
| NAPHTHALENE (SVOC)                 | 91-20-3S   | 730                                                                        | 35,000                                                            | 2.50E+05                                                                                          | 2.00E+08                                                         | 1.60E+07                                             | 1.00E+05                                                           | 8.80E+07                                                             | 5.20E+07                                             | NA                               | NA                                                                          | 490 J                                                                                                                                                        | --     | 230 J                                                                                                                                                    | --      | NM                | -- |  |
| PHENANTHRENE                       | 85-01-8    | 2,100                                                                      | 56,000                                                            | 2.80E+06                                                                                          | 6.70E+06                                                         | 1.60E+06                                             | 1.60E+05                                                           | 2.90E+06                                                             | 5.20E+06                                             | NA                               | NA                                                                          | 470 J                                                                                                                                                        | --     | 310 J                                                                                                                                                    | --      | NM                | -- |  |
| PYRENE                             | 129-00-0   | ID                                                                         | 4.80E+05                                                          | 1.00E+9 (D)                                                                                       | 6.70E+09                                                         | 2.90E+07                                             | 4.80E+05                                                           | 2.90E+09                                                             | 8.40E+07                                             | NA                               | NA                                                                          | 270 J                                                                                                                                                        | --     | 200 J                                                                                                                                                    | --      | NM                | -- |  |
| Organics - VOCs (ug/kg)            |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |                                                                                                                                                              |        |                                                                                                                                                          |         |                   |    |  |
| 1,2,3-TRIMETHYLBENZENE             | 526-73-8   | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | 270 (JT)                         | 800 (JT)                                                                    | NM                                                                                                                                                           | --     | NM                                                                                                                                                       | --      | NM                | -- |  |
| 1,2,4-TRIMETHYLBENZENE             | 95-63-6    | 570 (I)                                                                    | 2,100 (I)                                                         | 4.3E+6 (C,I)                                                                                      | 8.20E+10 (I)                                                     | 3.2E+07 (C,I)                                        | 2,100 (I)                                                          | 3.60E+10 (I)                                                         | 1.00E+8 (C,I)                                        | 150 (JT)                         | 430 (JT)                                                                    | 71                                                                                                                                                           | --     | 240                                                                                                                                                      | [18]    | NM                | -- |  |
| 1,3,5-TRIMETHYLBENZENE             | 108-67-8   | 1,100 (I)                                                                  | 1,800 (I)                                                         | 2.6E+6 (C,I)                                                                                      | 8.20E+10 (I)                                                     | 3.2E+07 (C)                                          | 2,100 (I)                                                          | 3.60E+10 (I)                                                         | 1.00E+8 (C,I)                                        | 100 (JT)                         | 300 (JT)                                                                    | <56 U                                                                                                                                                        | --     | 56                                                                                                                                                       | --      | NM                | -- |  |
| 2,2,4-TRIMETHYLPENTANE             | 540-84-1   | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM                                                                                                                                                           | --     | NM                                                                                                                                                       | --      | NM                | -- |  |
| 2-METHYLNAPHTHALENE (VOC)          | 91-57-6V   | 4,200                                                                      | 57,000                                                            | 2.70E+06                                                                                          | 6.70E+08                                                         | 8.10E+06                                             | 1.70E+05                                                           | 2.90E+08                                                             | 2.60E+07                                             | NA                               | NA                                                                          | 340                                                                                                                                                          | --     | 900                                                                                                                                                      | --      | NM                | -- |  |
| BENZENE                            | 71-43-2    | 240 (I,X)                                                                  | 100 (I)                                                           | 1,600 (I)                                                                                         | 3.80E+8 (I)                                                      | 1.8E+5 (I)                                           | 100 (I)                                                            | 4.70E+8 (I)                                                          | 8.40E+5 (C,I)                                        | 1.7 (M)                          | 7.9 (M)                                                                     | <56 U                                                                                                                                                        | --     | 56                                                                                                                                                       | [18,19] | NM                | -- |  |
| CYCLOHEXANE                        | 110-82-7   | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM                                                                                                                                                           | --     | NM                                                                                                                                                       | --      | NM                | -- |  |
| ETHYLBENZENE                       | 100-41-4   | 360                                                                        | 1,500                                                             | 87,000                                                                                            | 1.00E+10                                                         | 2.20E+07                                             | 1,500                                                              | 1.30E+10                                                             | 7.10E+07                                             | 12 (M)                           | 57                                                                          | <56 U                                                                                                                                                        | --     | 82                                                                                                                                                       | [18,19] | NM                | -- |  |
| HEXANE                             | 110-54-3   | NA                                                                         | 1.8E+5 (C)                                                        | 5.1E+5 (C)                                                                                        | 1.30E+10                                                         | 9.2E+7 (C)                                           | 5.10E+5 (C)                                                        | 5.90E+09                                                             | 3.00E+8 (C)                                          | 25                               | 74                                                                          | NM                                                                                                                                                           | --     | NM                                                                                                                                                       | --      | NM                | -- |  |
| ISOPROPYLBENZENE                   | 98-82-8    | 3,200                                                                      | 91,000                                                            | 4.00E+5 (C)                                                                                       | 5.80E+09                                                         | 2.50E+7 (C)                                          | 2.60E+05                                                           | 2.60E+09                                                             | 8.00E+7 (C)                                          | NA                               | NA                                                                          | <56 U                                                                                                                                                        | --     | <50 U                                                                                                                                                    | --      | NM                | -- |  |
| M,P-XYLENE                         | 1330-20-7  | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | 120                                                                                                                                                          | --     | 420                                                                                                                                                      | --      | NM                | -- |  |
| NAPHTHALENE (VOC)                  | 91-20-3V   | 730                                                                        | 35,000                                                            | 2.50E+05                                                                                          | 2.00E+08                                                         | 1.60E+07                                             | 1.00E+05                                                           | 8.80E+07                                                             | 5.20E+07                                             | NA                               | NA                                                                          | <280 U                                                                                                                                                       | --     | 820                                                                                                                                                      | [2]     | NM                | -- |  |
| N-PROPYLBENZENE                    | 103-65-1   | ID                                                                         | 1,600 (I)                                                         | ID                                                                                                | 1.30E+9 (I)                                                      | 2.50E+6 (I)                                          | 4,600                                                              | 5.90E+08                                                             | 8.00E+06                                             | 1,800                            | 3,500                                                                       | <56 U                                                                                                                                                        | --     | <50 U                                                                                                                                                    | --      | NM                | -- |  |
| O-XYLENE                           | 95-47-6    | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | 84                                                                                                                                                           | --     | 300                                                                                                                                                      | --      | NM                | -- |  |
| P-ISOPROPYL TOLUENE (p-CYMENTHENE) | 99-87-6    | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | <56 U                                                                                                                                                        | --     | <50 U                                                                                                                                                    | --      | NM                | -- |  |
| SEC-BUTYLBENZENE                   | 135-98-8   | ID                                                                         | 1,600                                                             | ID                                                                                                | 4.00E+08                                                         | 2.50E+06                                             | 4,600                                                              | 1.80E+08                                                             | 8.00E+06                                             | NA                               | NA                                                                          | <56 U                                                                                                                                                        | --     | <50 U                                                                                                                                                    | --      | NM                | -- |  |
| STYRENE                            | 100-42-5   | 530 (X)                                                                    | 2,700                                                             | 2.50E+05                                                                                          | 5.50E+09                                                         | 4.00E+05                                             | 2,700                                                              | 6.90E+09                                                             | 1.90E+6 (C)                                          | NA                               | NA                                                                          | <56 U                                                                                                                                                        | --     | <50 U                                                                                                                                                    | --      | NM                | -- |  |
| TETRACHLOROETHYLENE                | 127-18-4   | 220 (X)                                                                    | 100                                                               | 11,000                                                                                            | 2.70E+09                                                         | 2.0E+5 (C)                                           | 100                                                                | 1.20E+09                                                             | 9.30E+5 (C)                                          | 6.2 (M)                          | 12 (M)                                                                      | <56 U                                                                                                                                                        | --     | <50 U                                                                                                                                                    | --      | NM                | -- |  |
| TOLUENE                            | 108-88-3   | 5,400 (I)                                                                  | 16,000 (I)                                                        | 3.30E+5 (C,I)                                                                                     | 2.70E+10 (I)                                                     | 5E+07 (C,I)                                          | 16,000 (I)                                                         | 1.20E+10 (I)                                                         | 1.60E+8 (C,I)                                        | 3,700                            | 11,000                                                                      | 88                                                                                                                                                           | --     | 360                                                                                                                                                      | --      | NM                | -- |  |
| XYLENE - TOTAL                     | 1330-20-7  | 980 (I)                                                                    | 5,600 (I)                                                         | 6.30E+6 (I)                                                                                       | 2.90E+11 (I)                                                     | 4.1E+08 (C,I)                                        | 5,600 (I)                                                          | 1.30E+11 (I)                                                         | 1.00E+9 (C,D,I)                                      | 280 (J)                          | 830 (J)                                                                     | 204                                                                                                                                                          | --     | 720                                                                                                                                                      | [18]    | NM                | -- |  |
| Organics - Pesticides (ug/kg)      |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |                                                                                                                                                              |        |                                                                                                                                                          |         |                   |    |  |
| 4,4-DDE                            | 72-55-9    | NLL                                                                        | NLL                                                               | NLV                                                                                               | 3.20E+07                                                         | 45,000                                               | NLL                                                                | 4.00E+07                                                             | 1.90E+05                                             | NA                               | NA                                                                          | <3.9 U                                                                                                                                                       | --     | <3.6 U                                                                                                                                                   | --      | NM                | -- |  |
| 4,4-DDT                            | 50-29-3    | NLL                                                                        | NLL                                                               | NLV                                                                                               | 3.20E+07                                                         | 57,000                                               | NLL                                                                | 4.00E+07                                                             | 2.80E+05                                             | NA                               | NA                                                                          | <3.9 U                                                                                                                                                       | --     | <3.6 U                                                                                                                                                   | --      | NM                | -- |  |
| ALDRIN                             | 309-00-2   | NLL                                                                        | NLL                                                               | 1.30E+06                                                                                          | 6.40E+05                                                         | 1,000                                                | NLL                                                                | 8.00E+05                                                             | 4,300                                                | NA                               | NA                                                                          | <2 U                                                                                                                                                         | --     | <1.8 U                                                                                                                                                   | --      | NM                | -- |  |
| ALPHA-CHLORDANE                    | 5103-71-9  | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | <2 U                                                                                                                                                         | --     | <1.8 U                                                                                                                                                   | --      | NM                | -- |  |
| BETA-BHC                           | 319-85-7   | ID                                                                         | 37                                                                | NLV                                                                                               | 5.90E+06                                                         | 5,400                                                | 150                                                                | 7.40E+06                                                             | 25,000                                               | NA                               | NA                                                                          | <2 U                                                                                                                                                         | --     | <1.8 U                                                                                                                                                   | --      | NM                | -- |  |
| ENDOSULFAN I                       | 959-98-8   | NLL                                                                        | NLL                                                               | ID                                                                                                | ID                                                               | 1.4E+06 (J)                                          | NLL                                                                | ID                                                                   | 4.40E+06 (J)                                         | NA                               | NA                                                                          | <2 U                                                                                                                                                         | --     | <1.8 U                                                                                                                                                   | --      | NM                | -- |  |
| ENDRIN KETONE                      | 53494-70-5 | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | 5.9                                                                                                                                                          | --     | 3.1 J                                                                                                                                                    | --      | NM                | -- |  |
| GAMMA-CHLORDANE                    | 5103-74-2  | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | <2 U                                                                                                                                                         | --     | <1.8 U                                                                                                                                                   | --      | NM                | -- |  |
| HEPTACHLOR                         | 76-44-8    | NLL                                                                        | NLL                                                               | 3.50E+05                                                                                          | 2.40E+06                                                         | 5,600                                                | NLL                                                                | 3.00E+06                                                             | 23,000                                               | NA                               | NA                                                                          | <2 U                                                                                                                                                         | --     | <1.8 U                                                                                                                                                   | --      | NM                | -- |  |
| Other                              |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |                                                                                                                                                              |        |                                                                                                                                                          |         |                   |    |  |
| CHLORIDE (mg/kg)                   | --         | 94 (X)                                                                     | 5,000                                                             | NLV                                                                                               | ID                                                               | 500 (F)                                              | 5,000                                                              | ID                                                                   | 500 (F)                                              | NA                               | NA                                                                          | NM                                                                                                                                                           | --     | NM                                                                                                                                                       | --      | NM                | -- |  |
| PERCENT MOISTURE (%)               | --         | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM                                                                                                                                                           | --     | NM                                                                                                                                                       | --      | 8.9               | -- |  |
| HYDROCARBONS, TOTAL (mg/kg)        | --         | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM                                                                                                                                                           | --     | NM                                                                                                                                                       | --      | NM                | -- |  |

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 10-1  
Summary of Soil Analytical Results  
Area J  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Soil Table Footnotes:

- EGLE Part 201 residential and non-residential generic cleanup criteria and screening levels criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Release Date: December 30, 2013. Updated June 2018.

- Only detected analytes are listed - Gray rows indicate requested analyses. If no analytes are listed below a gray row then all analytes of that group were either not analyzed or not detected.

- **Bold** values are concentrations detected above the laboratory reporting limit.

- **Bold/Shaded** cells indicate analyte concentration exceeded applicable criteria. EGLE Part 201 criteria exceeded is indicated by the footnote in [brackets] following the result value and defined below:

- |                                                                                |                                                                                    |
|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| [2] - Groundwater Surface Water Interface Protection Criteria                  | [11] - Nonresidential Drinking Water Protection Criteria                           |
| [3] - Soil Saturation Concentration Screening Levels                           | [12] - Nonresidential Soil Volatilization to Indoor Air Inhalation Criteria (VIAC) |
| [4] - Residential Drinking Water Protection Criteria                           | [13] - Nonresidential Infinite Source Volatile Soil Inhalation Criteria (VSIC)     |
| [5] - Residential Soil Volatilization to Indoor Air Inhalation Criteria (VIAC) | [14] - Nonresidential Finite VSIC for 5 Meter Source Thickness                     |
| [6] - Residential Infinite Source Volatile Soil Inhalation Criteria (VSIC)     | [15] - Nonresidential Finite VSIC for 2 Meter Source Thickness                     |
| [7] - Residential Finite VSIC for 5 Meter Source Thickness                     | [16] - Nonresidential Particulate Soil Inhalation Criteria                         |
| [8] - Residential Finite VSIC for 2 Meter Source Thickness                     | [17] - Nonresidential Direct Contact Criteria                                      |
| [9] - Residential Particulate Soil Inhalation Criteria                         | [18] - Soil Residential MSSL                                                       |
| [10] - Residential Direct Contact Criteria                                     | [19] - Soil Nonresidential MSSL                                                    |

Evaluation based on EGLE Criteria at time of Project completion.

Samples described in this evaluation may actually refer to stamp sands or to other mining waste from the historic mining and reclamation processes conducted in the area.

- |                                  |                                                                                   |
|----------------------------------|-----------------------------------------------------------------------------------|
| -- = No Exceedances              | PCBs = Polychlorinated biphenyls                                                  |
| NM = Not Measured                | VOC = Volatile organic compound                                                   |
| ND = Not Detected                | SVOC = Semi-volatile organic compound                                             |
| bgs = Below ground surface       | MSSL = Media-Specific Volatilization to Indoor Air Interim Action Screening Level |
| ft = Feet                        | ug/kg = Micrograms per kilogram                                                   |
| in = Inches                      | % = Percentage                                                                    |
| mg/kg = Milligrams per kilogram. |                                                                                   |

Criteria Footnotes:

ID = Insufficient data to develop criterion.

NA = A criterion or value is not available

NLL = Hazardous substance is not likely to leach under most soil conditions.

(B) = Background, as defined in R 299.1(b), may be substituted if higher than the calculated cleanup criterion. Background levels may be less than criteria for some inorganic compounds.

(BB) = The state drinking water standard for asbestos (fibers greater than 10 micrometers in length) is in units of a million fibers per liter of water (MFL). Soil concentrations of asbestos are determined by polarized light microscop.

(C) = The criterion developed under R 299.20 to R 299.26 exceeds the chemical- specific soil saturation screening level (Csat). The person proposing or implementing response activity shall document whether additional response activity is required to control free-phase liquids or NAPL to protect against risks associated with free-phase liquids by using methods appropriate for the free-phase liquids present. Development of a site-specific Csat or methods presented in R 299.22, R 299.24(5), and R 299.26(8) may be conducted for the relevant exposure pathways.

(D) = Calculated criterion exceeds 100 percent, hence it is reduced to 100 percent or 1.0E+9 parts per billion (ppb).

(DD) = Hazardous substance causes developmental effects. Residential direct contact criteria are protective of both prenatal and postnatal exposure. Nonresidential direct contact criteria are protective for a pregnant adult receptor.

(F) = Criterion is based on adverse impacts to plant life and phytotoxicity.

(G) = Groundwater surface water interface (GSI) criterion depends on the pH or water hardness, or both, of the receiving surface water. The final chronic value (FCV) for the protection of aquatic life shall be calculated based on the pH or hardness of the receiving surface water. Where water hardness exceeds 400 mg Ca/L, use 400 mg CaCO<sub>3</sub>/L for the FCV calculation. The FCV formula provides values in units of ug/L or ppb.

The generic GSI criterion is the lesser of the calculated FCV, the wildlife value (WV), and the surface water human non-drinking water value (HNDV). The soil GSI protection criteria for these hazardous substances are the greater of the 20 times the GSI criterion or the GSI soil-water partition values using the GSI criteria developed with the procedure described in this footnote. A spreadsheet that may be used to calculate GSI and GSI protection criteria for (G)-footnoted hazardous substances is available on the Department of Environment, Great Lakes, and Energy (EGLE) internet web site. A hardness value of 47.5 CaCO<sub>3</sub>/L and pH of 7, derived from the Michigan Department of Environmental Quality Draft Site Inspection Report for Lake Linden Operations dated 3/29/13, was used in the footnote G calculation spreadsheet.

(H) = Valence-specific chromium data (Cr III and Cr VI) shall be compared to the corresponding valence-specific cleanup criteria. If both Cr III and Cr VI are present in groundwater, the total concentration of both cannot exceed the drinking water criterion of 100 ug/L. If analytical data are provided for total chromium only, they shall be compared to the cleanup criteria for Cr VI. Cr III soil cleanup criterion for protection of drinking water can only be used at sites where groundwater is prevented from being used as a public water supply, currently and in the future, through an approved land or resource use restriction.

(I) = Hazardous substance may exhibit the characteristic of ignitability as defined in 40 C.F.R. §261.21 (revised as of July 1, 2001), which is adopted by reference in these rules and is available for inspection at the EGLE, 525 West Allegan Street, Lansing, Michigan. Copies of the regulation may be purchased, at a cost as of the time of adoption of these rules of \$45, from the Superintendent of documents, Government Printing Office, Washington, DC 20401 (stock number 869-044-00155-1), or from the EGLE, Remediation and Redevelopment Division (RRD), 525 West Allegan Street, Lansing, Michigan 48933, at cost.

(J) = Hazardous substance may be present in several isomer forms. Isomer-specific concentrations shall be added together for comparison to criteria.

(M) = Calculated criterion is below the analytical target detection limit, therefore, the criterion defaults to the target detection limit.

(P) = Amenable cyanide methods or method OIA-1677 shall be used to quantify cyanide concentrations for compliance with all groundwater criteria. Total cyanide methods or method OIA-1677 shall be used to quantify cyanide concentrations for compliance with soil criteria. Nonresidential direct contact criteria may not be protective of the potential for release of hydrogen cyanide gas. Additional land or resource use restrictions may be necessary to protect for the acute inhalation concerns associated with hydrogen cyanide gas.

(Q) = Criteria for carcinogenic polycyclic aromatic hydrocarbons were developed using relative potential potencies to benzo(a)pyrene.

(R) = Hazardous substance may exhibit the characteristic of reactivity as defined in 40 C.F.R. §261.23 (revised as of July 1, 2001), which is adopted by reference in these rules and is available for inspection at the EGLE, 525 West Allegan Street, Lansing, Michigan. Copies of the regulation may be purchased, at a cost as of the time of adoption of these rules of \$45, from the Superintendent of Documents, Government Printing Office, Washington, DC 20401 (stock number 869-044-00155-1), or from the EGLE, RRD, 525 West Allegan Street, Lansing, Michigan 48933, at cost.

(T) = Refer to the federal Toxic Substances Control Act (TSCA), 40 C.F.R. §761, Subpart D and 40 C.F.R. §761, Subpart G, to determine the applicability of TSCA cleanup standards. Subpart D and Subpart G of 40 C.F.R. §761 (July 1, 2001) are adopted by reference in these rules and are available for inspection at the EGLE, 525 West Allegan Street, Lansing, Michigan. Copies of the regulations may be purchased, at a cost as of the time of adoption of these rules of \$55, from the Superintendent of Documents, Government Printing Office, Washington, DC 20401, or from the EGLE, RRD, 525 West Allegan Street, Lansing, Michigan 48933, at cost. Alternatives to compliance with the TSCA standards listed below are possible under 40 C.F.R. §761 Subpart D. New releases may be subject to the standards identified in 40 C.F.R. §761, Subpart G. Use Part 201 soil direct contact cleanup criteria in the published table if TSCA standards are not applicable.

(X) = The GSI criterion shown in the generic cleanup criteria tables is not protective for surface water that is used as a drinking water source. (See R 299.49 Footnotes for generic cleanup criteria tables for additional information.)

(Z) = Mercury is typically measured as total mercury. The generic cleanup criteria, however, are based on data for different species of mercury. Specifically, data for elemental mercury, chemical abstract service (CAS) number 7439976, serve as the basis for the soil volatilization to indoor air criteria, groundwater volatilization to indoor air, and soil inhalation criteria. Data for methyl mercury, CAS number 22967926, serve as the basis for the GSI criterion; and data for mercuric chloride, CAS number 7487947, serve as the basis for the drinking water, groundwater contact, soil direct contact, and the groundwater protection criteria. Comparison to criteria shall be based on species-specific analytical data only if sufficient facility characterization has been conducted to rule out the presence of other species of mercury.

MSSL Footnotes:

J = Hazardous substance may be present in several isomer forms. Isomer-specific concentrations must be added together for comparison to screening level.

JT = Hazardous substance may be present in several isomer forms. Screening levels may be used for the individual isomer provided that it is the sole isomer detected; however, when multiple isomers are detected in a medium, the isomer-specific concentrations must be added together and compared to the most restrictive screening level of the detected isomers.

M = The screening level may be below target detection limits (TDL).

Laboratory Footnotes:

J = The result is an estimated quantity.

U = Analyte analyzed for but not detected above the reported sample reporting limit.

UU = Analyte analyzed for but not detected above the reported sample reporting limit and is an estimated quantity.



**TABLE 10-1**  
**Summary of Soil Analytical Results**  
**Area J**  
**Quincy Mining Company Portage Operations Area**  
**Abandoned Mining Wastes - Torch Lake Non-Superfund Site**

|                                                                                                         | Part 201 Generic Cleanup Criteria Evaluated                                        | Exceedance |
|---------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------|
| <b>EGLE Part 201 Generic Cleanup Criteria<br/>(June 2018)</b>                                           | [2] - Groundwater Surface Water Interface Protection Criteria                      | YES        |
|                                                                                                         | [3] - Soil Saturation Concentration Screening Levels                               | NO         |
|                                                                                                         | [4] - Residential Drinking Water Protection Criteria                               | YES        |
|                                                                                                         | [5] - Residential Soil Volatilization to Indoor Air Inhalation Criteria (VIAC)     | NO         |
|                                                                                                         | [6] - Residential Infinite Source Volatile Soil Inhalation Criteria (VSIC)         | NO         |
|                                                                                                         | [7] - Residential Finite VSIC for 5 Meter Source Thickness                         | NO         |
|                                                                                                         | [8] - Residential Finite VSIC for 2 Meter Source Thickness                         | NO         |
|                                                                                                         | [9] - Residential Particulate Soil Inhalation Criteria                             | YES        |
|                                                                                                         | [10] - Residential Direct Contact Criteria                                         | YES        |
|                                                                                                         | [11] - Nonresidential Drinking Water Protection Criteria                           | YES        |
|                                                                                                         | [12] - Nonresidential Soil Volatilization to Indoor Air Inhalation Criteria (VIAC) | NO         |
|                                                                                                         | [13] - Nonresidential Infinite Source Volatile Soil Inhalation Criteria (VSIC)     | NO         |
|                                                                                                         | [14] - Nonresidential Finite VSIC for 5 Meter Source Thickness                     | NO         |
|                                                                                                         | [15] - Nonresidential Finite VSIC for 2 Meter Source Thickness                     | NO         |
|                                                                                                         | [16] - Nonresidential Particulate Soil Inhalation Criteria                         | YES        |
|                                                                                                         | [17] - Nonresidential Direct Contact Criteria                                      | NO         |
| <b>Media-Specific Volatilization to Indoor Air Interim<br/>Action Screening Levels<br/>(March 2021)</b> | [18] - Soil Residential Media-Specific Screening Level (MSSL)                      | YES        |
|                                                                                                         | [19] - Soil Nonresidential MSSL                                                    | YES        |

## 11. DETAILED FINDINGS – AREA K

This Section summarizes applicable information available for Area K within QMCP derived from implementation of the SAP. The narrative follows the systematic investigative approach outlined in **Section 3**, while providing specific details about the potential human health and ecological risks associated with the historical mining operations in the subarea of QMCP.

### 11.1 SITE INSPECTION AND INVESTIGATION RESULTS

The implementation of the site inspection and investigation activities provided critical lines of evidence that link the historical documentation and the current environmental conditions in and around the Portage Canal. The following subsections present the findings of the inspection and investigation activities and provide correlation of mining era operations and their potential impacts on the nearshore and offshore environment of the Portage Canal.

#### 11.1.1 Site Inspection

The site inspection at each subarea included the inventory and locating of historical structures and similar surficial artifacts associated with the former industrial operations in the area. Each subarea was also inspected for potential physical and health hazards that were documented, photographed, and located with a GPS unit. The inventoried hazards were then qualitatively assessed for potential human health and environmental risks to determine if analytical sampling was warranted during the targeted inspection phase of the work.

On September 27, 2018, MSG field team personnel performed reconnaissance activities at Area K. In the cases where access was not requested based on historic operational and investigative findings, property conditions were evaluated from a neighboring property or public right of way where access was permitted. Access to Area K was not requested based on historic operational and investigative findings.

Therefore, the property parcel known as the Bayside Condominium Complex totaling approximately 26 acres was visually inspected and observations were recorded from the public road right of way. The following provides a summary of the findings associated with the reconnaissance activities. A copy of the reconnaissance log is provided in **Appendix C, Site Inspections – Reconnaissance Logs, Targeted Inspections & Physical Hazards Inventory**.

##### 11.1.1.1 Reconnaissance

The reconnaissance activities did not identify potentially abandoned containers or other environmental concerns. The qualitative assessment of the reconnaissance findings in Area K did not warrant the performance of limited targeted inspection activities.

#### 11.1.2 Site Investigation

Area K was not sampled nor was historic sampling data available as part of the SI report. Other environmental concerns, including those within the MDNR trail property, have been addressed and/or mitigated through interim responses undertaken by prior owners and further investigation as part of QMCP did not occur.

## 12. DETAILED FINDINGS – AREA M

This Section summarizes the results and the subsequent findings for Area M within QMCP derived from implementation of the SAP. The narrative follows the systematic investigative approach outlined in **Section 3**, while providing specific details about the potential human health and ecological risks associated with the historical mining operations in this subarea of QMCP.

### 12.1 SITE INSPECTION AND INVESTIGATION RESULTS

The implementation of the site inspection and investigation activities provided critical lines of evidence that link the historical documentation and the current environmental conditions in and around the Portage Canal. The following subsections present the findings of the inspection and investigation activities and provide correlation of mining era operations and their potential impacts on the nearshore and offshore environment of the Portage Canal.

#### 12.1.1 Site Inspection

The site inspection at each subarea included the inventory and locating of historical structures and similar surficial artifacts associated with the former industrial operations in the area. Each subarea was also inspected for potential physical and health hazards that were documented, photographed, and located with a GPS unit. The inventoried hazards were then qualitatively assessed for potential human health and environmental risks to determine if analytical sampling was warranted during the targeted inspection phase of the work.

On September 26, 2018, MSG field team personnel performed reconnaissance activities at Area M. The property parcel known as the Dollar Bay Well Field totaling approximately 15 acres was visually inspected and observations were recorded while traversing the property. The qualitative assessment of the reconnaissance findings in Area M warranted the performance of limited targeted inspection activities. The following provides a summary of the findings associated with the reconnaissance activities. A copy of the reconnaissance is provided in **Appendix C, Site Inspections – Reconnaissance Logs, Targeted Inspections & Physical Hazards Inventory**.

##### 12.1.1.1 Reconnaissance

The reconnaissance activities identified two fire extinguishers, several rusted and crushed and/or empty drum carcasses, and roofing material that was SACM.

##### 12.1.1.2 Targeted Inspection

The qualitative assessment of the reconnaissance findings in Area M warranted the performance of limited targeted inspection activities. Bulk material samples for asbestos analysis were collected on October 1, 2018 by a MSG field team. The following subsections summarize the findings of these sampling efforts.

##### 12.1.1.2.1 Bulk Material Sampling

Based on the SACM hazards noted during the reconnaissance activities a limited asbestos survey was conducted as part of the SI to identify suspect potentially friable ACM. The asbestos survey was limited to SACMs in open areas of the properties, and within debris piles.

Two bulk samples were collected from one SACM as part of the SI. Laboratory analysis indicated that neither of the material samples contained greater than 1% asbestos. SACM identified within Area M included roofing where trash appeared to have been dumped.

The samples were analyzed in accordance with EPA Method 600/R-93/116, “Method for the Determination of Asbestos in Bulk Building Materials” using Polarized Light Microscopy (PLM). This laboratory analytical method identifies the presence and estimated concentration of asbestos fibers in sampled building materials. The location of the bulk asbestos sampling location during the targeted inspection activities is depicted on **Figure 12-1, ACM Analytical Results (Area M)**. A detailed summary of bulk asbestos sample analytical results collected from Area M during the targeted inspection are provided in **Table 12-1, Summary of ACM Analytical Results (Area M)**.

## 12.1.2 Site Investigation

The SI in the QMCP was developed based on a variety of data and information as outlined in **Section 3**. In addition to the historical accounts and documentation, current land use and potential exposure pathways were also taken into consideration when selecting the sampling locations specific to Area M. The following subsections present the outcomes of investigative activities completed in Area M by summarizing the laboratory analytical results and characterizing their impacts on the environmental media in which they were detected.

### 12.1.2.1 Terrestrial Investigation

Intrusive investigation activities in Area M were generally guided by the findings of historical research and field observations. From a historical standpoint, the area was the location of operations subject to or associated with historic mining practices of the Lake Superior Smelting Co. and is currently the location of the Dollar Bay Well Field.

COCs in the study area were not generally understood and previous investigative activities did not fully characterize or address organic and inorganic contaminants in soil and groundwater. The following subsections present a summary of the field observations and analytical results derived from the terrestrial sampling activities.

#### 12.1.2.1.1 Field Observations – Soil and Groundwater

Borings within Area M were advanced by GSS to depths between 9 and 16 ft bgs. Boring locations are depicted on **Figure 12-2, Soil Analytical Results (Area M)**. Soil observations documented on field logs indicate that the subsurface of Area M is generally comprised of fine to medium brown sand at locations along the shoreline (SB-37 and SB-38). Fine to medium-coarse gray sand transitioning to fine to coarse brown sands at approximately 2 ft bgs were observed at soil boring locations within the central and eastern portions of the property.

During groundwater sampling, temporary well points were generally established at 4 ft intervals ranging from 9 ft to 16 ft bgs to the bottom of the screened interval. Saturated soil conditions were generally encountered between depths of 5 ft and 12 ft bgs. Groundwater quality parameters, including temperature, conductivity, DO, and pH, measured at the time of sample collection were generally considered normal.

#### 12.1.2.1.2 Soil Sampling Results

Terrestrial soil investigation activities were completed at Area M between September 6 and 11, 2018. During the mobilization a total of 20 soil samples including one duplicate soil sample were collected from 11 locations. Soil sample locations are depicted on **Figure 12-2, Soil Analytical Results (Area M)**. Investigative methodologies and soil sampling techniques were conducted using the procedures outlined in **Section 3**.

Soil sampling included 11 shallow soil locations, generally from 0 to 6 inches in depth with the balance of the locations advanced for collection of subsurface soil samples ranging from 0.5 ft to 12 ft in depth. The samples were analyzed for the parameters identified on **Table 3-1, Sampling and Analysis Summary** of this SI Report. The selection of analytical parameters was generally based upon potential environmental impacts associated with mining era operations in the vicinity of the sampling location or field observations.

The shallow surface and subsurface soil analytical results for Area M contained several COCs at concentrations at or above applicable regulatory criteria.

A detailed summary of soil analytical results collected from Area M is provided in **Table 12-2, Summary of Soil Analytical Results (Area M)**. Soil boring logs are included in **Appendix E, Boring Logs** of this SI Report.

#### 12.1.2.1.3 Groundwater Sampling Results

During the installation of soil borings at Area M, six (6) temporary groundwater sampling locations were established to characterize groundwater in the area. The temporary sampling points were installed and sampled using the methodologies presented in **Section 3**. The screened intervals at the groundwater sampling locations were established ranging from 5 ft to 9 ft bgs to 12 ft to 16 ft bgs. A total of six (6) groundwater samples were collected. Temporary groundwater and existing monitoring well sampling locations are depicted on **Figure 12-3, Groundwater Analytical Results (Area M)**.

Collected groundwater samples were analyzed for the parameters identified on **Table 3-1, Sampling and Analysis Summary** of this SI Report. The selection of analytical parameters was generally based upon potential environmental impacts associated with mining era operations in the vicinity of the sampling location or field observations. PCBs were not detected in groundwater at Area M nor were any other COCs detected in groundwater above applicable criteria with the exception of metals, which were not evaluated further as discussed in **Section 4.2.5**.

A detailed summary of groundwater analytical results collected from Area M is provided in **Table 12-3, Summary of Groundwater Analytical Results (Area M)**. Groundwater analytical results are depicted on **Figure 12-3, Groundwater Analytical Results (Area M)**. Soil boring logs are included in **Appendix E, Boring Logs** of this SI Report.

## 12.2 NATURE AND EXTENT OF CONTAMINATION

Utilizing the established regulatory criteria presented in **Section 4** for various land use categories and exposure pathways, the laboratory analytical results summarized in the preceding section for Area M were reviewed and compared to EGLE Cleanup Criteria Requirements for Response Activity as applicable for the sampled environmental media.

### 12.2.1 Comprehensive Exposure Assessment

The comparison was completed to determine which ecological and human exposure pathways, risks, and conditions are relevant at Area M. Although not inclusive of relevant pathways where regulatory criteria were not exceeded, the following exposure pathways were determined to be relevant in Area M:

- Risks posed by hazardous substances in soil and the potential for the substances to leach to groundwater that could vent to surface water.
- Risks posed by hazardous substances in soil and the potential for direct contact with these soils in both residential and nonresidential settings.

As discussed in **Section 4.2.5**, EGLE drinking water and groundwater/surface water pathway criteria exceedances for metals were excluded from the soil and groundwater evaluation. The rationale for this exclusion is twofold:

- The Project investigation and anticipated response actions are being undertaken pursuant to Part 201 of NREPA, being PA 451 of 1994, as amended. The concentrations of metals in excess of the EGLE drinking water and groundwater/surface water pathway criteria are ubiquitous in the study area and are predominantly the result of the presence of stamp sands. Stamp sands are not defined as a hazardous substance nor are subject to regulation under Part 201 unless the property otherwise contains hazardous substances in excess of concentrations that satisfy the cleanup criteria for unrestricted residential use; and,
- The study area is part of OU 2 for which the EPA ROD remedy called for No Action. The EPA's ROD OU 2 includes groundwater, surface water, submerged tailings and sediments in Torch Lake, Portage Lake, the Portage Canal, and other area water bodies. Note that EPA's No Action determination relies on the following to mitigate the effects of stamp sand to the extent practicable:
  - The reduction of stamp sand loading to surface water bodies expected as a result of the remedial action taken at OU 1 and OU 3.
  - Ongoing natural sedimentation and detoxification.
  - Institutional programs and practices controlling potential future exposure to site-affected drinking water which were intended to be administered at the county and state level.
  - The long-term monitoring and the five-year review process monitoring requirements of the remedy selected for OU 1 and OU 3 under the 1992 ROD.

Note that metals criteria for other relevant pathways, and cyanide and organic contaminants for all pathways were included in the evaluation.

Furthermore, as discussed in **Section 4.2.5**, EGLE's MSSSLs were not included in the exposure pathway assessment due to unknown anticipated future land use and conditions. The MSSSLs were considered for screening and delineation purposes only.

#### *12.2.1.1 Building Materials and Containers*

During the targeted inspection activities completed at Area M, one SACM was identified and samples were collected from the building (roofing) materials.

The following table provides an aggregate summary of the sample locations with respect to the total number of samples and how they compare to applicable regulatory criteria. The table is based solely on the total number of samples, inclusive of historical samples, collected from Area M. It lists only the number of samples for a specific analytical suite that contained one or more exceedance of a given criterion. Bulk asbestos samples were compared to applicable NESHAP standards and EGLE PSIC.



| Building Materials Analytical Result Summary Table                  | Analytical Summary      |                   |                   | National Emissions Standard for Hazardous Air Pollutants |                               |
|---------------------------------------------------------------------|-------------------------|-------------------|-------------------|----------------------------------------------------------|-------------------------------|
|                                                                     | Total Number of Samples | Detected Analytes | Total Exceedances | Friable Asbestos Material                                | Non-Friable Asbestos Material |
| Asbestos (Bulk)                                                     | 2                       | 0                 | 0                 | 0                                                        | 0                             |
| COCs exceeding applicable regulatory criteria in one or more sample |                         |                   |                   | Not applicable                                           |                               |

During the targeted inspection activities completed at Area M, four total drums were identified; however, none were sampled due to the nature of their contents. Most appeared to be empty or were observed to be drum carcasses.

#### 12.2.1.2 Soil Exposure Pathway Assessment

Soil analytical results from Area M identified COC concentrations in soil that were at or above concentrations that trigger a “Facility” designation as defined in Section 20101(1)(s) of the NREPA. The following tables provide an aggregate summary of the soil sample locations with respect to the total number of samples and how they compare to the applicable EGLE Cleanup Criteria for Response Activity under both Residential and Nonresidential exposure scenarios. The tables are based solely on the total number of samples, inclusive of historical samples, collected from Area M. They list only the number of samples for a specific analytical suite that contained one or more exceedance of a given criterion.

| Soil Analytical Result Summary Table                                 | Cleanup Criteria Requirements for Response Activity – Residential** |                    |                    |                                                                                                    |                                                         |                                                       |                                                          |                                          |                                          |                                      |                         |                                                |
|----------------------------------------------------------------------|---------------------------------------------------------------------|--------------------|--------------------|----------------------------------------------------------------------------------------------------|---------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------|------------------------------------------|------------------------------------------|--------------------------------------|-------------------------|------------------------------------------------|
|                                                                      | Analytical Summary                                                  |                    |                    | Groundwater Protection                                                                             |                                                         | Indoor Air                                            | Ambient Air                                              |                                          |                                          |                                      | Contact                 | Csat                                           |
|                                                                      | Total Number of Samples                                             | Detected Analytes* | Total Exceedances* | Residential Drinking Water Protection Criteria                                                     | Groundwater Surface Water Interface Protection Criteria | Soil Volatilization to Indoor Air Inhalation Criteria | Infinite Source Volatile Soil Inhalation Criteria (VSIC) | Finite VSIC for 5 Meter Source Thickness | Finite VSIC for 2 Meter Source Thickness | Particulate Soil Inhalation Criteria | Direct Contact Criteria | Soil Saturation Concentration Screening Levels |
| Inorganics                                                           | 18                                                                  | 139                | 10                 | NA*                                                                                                | NA*                                                     | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 9                       | 0                                              |
| Cyanide                                                              | 6                                                                   | 0                  | 0                  | 0                                                                                                  | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| VOCs                                                                 | 12                                                                  | 51                 | 2                  | 0                                                                                                  | 1                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| SVOCs                                                                | 18                                                                  | 60                 | 4                  | 0                                                                                                  | 3                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Asbestos                                                             | 2                                                                   | 0                  | 0                  | 0                                                                                                  | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Total PCBs                                                           | 12                                                                  | 0                  | 0                  | 0                                                                                                  | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Pesticides                                                           | 0                                                                   | 0                  | 0                  | 0                                                                                                  | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| COCs exceeding applicable regulatory criteria in one or more samples |                                                                     |                    |                    | ARSENIC, COPPER, FLUORANTHENE, NAPHTHALENE (SVOC), PHENANTHRENE, NAPHTHALENE (VOC), XYLENE - TOTAL |                                                         |                                                       |                                                          |                                          |                                          |                                      |                         |                                                |

NA\* = The EGLE drinking water and groundwater/surface water interface pathway criteria exceedances for metals are excluded from the groundwater evaluation as explained in Section 4.2.5.

\*Denotes total number of specific instances of an analyte being detected or exceeding criteria, can be multiple within one sample location.

\*\*Denotes total number of samples exceeding criteria, cannot be multiple within one sample location.

Total exceedance column does not include MSSLS or non-applicable criteria (DWPC and GSIPC for metals).

| Soil Analytical Result Summary Table                                 | Cleanup Criteria Requirements for Response Activity – Nonresidential** |                    |                    |                                                                                            |                                                         |                                                       |                                                          |                                          |                                          |                                      |                         |                                                |
|----------------------------------------------------------------------|------------------------------------------------------------------------|--------------------|--------------------|--------------------------------------------------------------------------------------------|---------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------|------------------------------------------|------------------------------------------|--------------------------------------|-------------------------|------------------------------------------------|
|                                                                      | Analytical Summary                                                     |                    |                    | Groundwater Protection                                                                     |                                                         | Indoor Air                                            | Ambient Air                                              |                                          |                                          |                                      | Contact                 | Csat                                           |
|                                                                      | Total Number of Samples                                                | Detected Analytes* | Total Exceedances* | Nonresidential Drinking Water Protection Criteria                                          | Groundwater Surface Water Interface Protection Criteria | Soil Volatilization to Indoor Air Inhalation Criteria | Infinite Source Volatile Soil Inhalation Criteria (VSIC) | Finite VSIC for 5 Meter Source Thickness | Finite VSIC for 2 Meter Source Thickness | Particulate Soil Inhalation Criteria | Direct Contact Criteria | Soil Saturation Concentration Screening Levels |
| Inorganics                                                           | 18                                                                     | 139                | 6                  | NA*                                                                                        | NA*                                                     | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 6                       | 0                                              |
| Cyanide                                                              | 6                                                                      | 0                  | 0                  | 0                                                                                          | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| VOCs                                                                 | 12                                                                     | 51                 | 2                  | 0                                                                                          | 1                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| SVOCs                                                                | 18                                                                     | 60                 | 4                  | 0                                                                                          | 3                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Asbestos                                                             | 0                                                                      | 0                  | 0                  | 0                                                                                          | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Total PCBs                                                           | 12                                                                     | 0                  | 0                  | 0                                                                                          | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| Pesticides                                                           | 0                                                                      | 0                  | 0                  | 0                                                                                          | 0                                                       | 0                                                     | 0                                                        | 0                                        | 0                                        | 0                                    | 0                       | 0                                              |
| COCs exceeding applicable regulatory criteria in one or more samples |                                                                        |                    |                    | ARSENIC, FLUORANTHENE, NAPHTHALENE (SVOC), PHENANTHRENE, NAPHTHALENE (VOC), XYLENE - TOTAL |                                                         |                                                       |                                                          |                                          |                                          |                                      |                         |                                                |

NA\* = The EGLE drinking water and groundwater/surface water interface pathway criteria exceedances for metals are excluded from the groundwater evaluation as explained in Section 4.2.5.

\*Denotes total number of specific instances of an analyte being detected or exceeding criteria, can be multiple within one sample location.

\*\*Denotes total number of samples exceeding criteria, cannot be multiple within one sample location.

Total exceedance column does not include MSSLS or non-applicable criteria (DWPC and GSIPC for metals).

### 12.2.1.3 Groundwater Exposure Pathway Assessment

Groundwater analytical results from Area M did not identify COC concentrations in groundwater that were at or above concentrations that trigger a “Facility” designation as defined in Section 20101(1)(s) of the NREPA. Similar to the preceding soil tables, the following table provides a summary of the aforementioned sample locations with respect to the total number of samples and how they compare to the applicable EGLE Cleanup Criteria for Response Activity under both Residential and Nonresidential exposure scenarios.

| Groundwater Analytical Result Summary Table                          | Analytical Summary      |                                    |                    | Cleanup Criteria Requirements for Response Activity – Residential and Nonresidential** |                                        |                                              |                                                                          |                                                                             |                  |                                               |
|----------------------------------------------------------------------|-------------------------|------------------------------------|--------------------|----------------------------------------------------------------------------------------|----------------------------------------|----------------------------------------------|--------------------------------------------------------------------------|-----------------------------------------------------------------------------|------------------|-----------------------------------------------|
|                                                                      | Total Number of Samples | Total Number of Detected Analytes* | Total Exceedances* | Residential Drinking Water Criteria                                                    | Nonresidential Drinking Water Criteria | Groundwater Surface Water Interface Criteria | Residential Groundwater Volatilization to Indoor Air Inhalation Criteria | Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria | Water Solubility | Flammability and Explosivity Screening Levels |
| Inorganics                                                           | 8                       | 45                                 | 0                  | NA*                                                                                    | NA*                                    | NA*                                          | 0                                                                        | 0                                                                           | 0                | 0                                             |
| Cyanide                                                              | 0                       | 0                                  | 0                  | 0                                                                                      | 0                                      | 0                                            | 0                                                                        | 0                                                                           | 0                | 0                                             |
| VOCs                                                                 | 8                       | 0                                  | 0                  | 0                                                                                      | 0                                      | 0                                            | 0                                                                        | 0                                                                           | 0                | 0                                             |
| SVOCs                                                                | 21                      | 9                                  | 0                  | 0                                                                                      | 0                                      | 0                                            | 0                                                                        | 0                                                                           | 0                | 0                                             |
| Total PCBs                                                           | 6                       | 0                                  | 0                  | 0                                                                                      | 0                                      | 0                                            | 0                                                                        | 0                                                                           | 0                | 0                                             |
| Pesticides                                                           | 0                       | 0                                  | 0                  | 0                                                                                      | 0                                      | 0                                            | 0                                                                        | 0                                                                           | 0                | 0                                             |
| COCs exceeding applicable regulatory criteria in one or more samples |                         |                                    |                    | Not applicable                                                                         |                                        |                                              |                                                                          |                                                                             |                  |                                               |

NA\* = The EGLE drinking water and groundwater/surface water interface pathway criteria exceedances for metals are excluded from the groundwater evaluation as explained in Section 4.2.5.

\*Denotes total number of specific instances of an analyte being detected or exceeding criteria, can be multiple within one sample location.

\*\*Denotes total number of samples exceeding criteria, cannot be multiple within one sample location.

Total exceedance column does not include MSSLS or non-applicable criteria (DWC and GSIC for metals).

## 12.2.2 Extent of Contamination

The comparison of analytical results to applicable regulatory criteria indicates that potential human health and ecological risks are present in soil in Area M. Recalling the goals and objectives of the SI, the following subsections describe the extent of contamination in environmental media in the study area.

### 12.2.2.1 Building Materials and Containers Extent of Contamination

Reconnaissance activities and asbestos analytical results for the sampled roofing material did not confirm that ACM is present in Area M.

### 12.2.2.2 Soil Extent of Contamination

Soil analytical results exceeded GSIPC, and both DCC and MSSLS in residential and nonresidential exposure scenarios within Area M. The predominant contaminants were VOCs, SVOCs, and inorganic compounds, with arsenic exceeding residential and/or nonresidential DCC at seven locations. VOC concentrations exceeding GSIPC and residential/nonresidential MSSLS, and SVOC concentrations exceeding GSIPC were detected in samples collected from both near historic mining building foundations (SB39 and SS26) and along the eastern property boundary (SB41 and SB42).

Most samples were collected from surface and subsurface soil intervals from areas that are generally accessible to the public despite being private or municipally-owned properties. The sampling locations were within approximately 50 ft to 800 ft of the shoreline of the Portage Canal.

The extent of contaminated soil has not been delineated within Area M. Soils with elevated levels of inorganic COCs are ubiquitous in the area, which becomes a limiting factor when evaluating potential exposure pathways. In the case of Area M, elevated concentrations of inorganic and VOC contaminants potentially include exposure risks related to inhalation and dermal contact pathways, which must be a consideration when evaluating land use, property accessibility, and the extent of contamination in surface and near surface soils that could be encountered through normal use of the property.

The remaining exposure risks are generally related to the leaching of contaminants to groundwater and their potential impacts on surface water. These risks pose a long-term threat to the overall environmental health of the watershed. The widespread distribution of inorganic COCs throughout the region limit determinations related to the extent of metals contamination in Area M. Nevertheless, risks are posed to groundwater and surface water and are a factor when evaluating the extent of soil contamination in Area M.

#### 12.2.2.3 *Groundwater Extent of Contamination*

Groundwater analytical results did not exceed applicable criteria for organic or inorganic contaminants throughout the investigated area, with the exception of metals, which were not evaluated further as discussed in **Section 4.2.5**.

No other analyzed constituents were detected above criteria within Area M. The groundwater sampling locations were established in a zone roughly 50 ft to 800 ft from the shoreline of the Portage Canal.

The potential risks associated with groundwater as a drinking water source as well as its connectivity to nearby surface water bodies should be a consideration in determinations related to the extent of contamination in Area M.

### 12.3 **CONCLUSIONS AND RECOMMENDATIONS**

The analytical results and interpretation summarized in the preceding subsections document potential human health and ecological risks that are present in Area M. The following subsections provide a synopsis of these findings and a recommended path forward for mitigating these risks in Area M.

#### 12.3.1 **Conclusions**

Environmental impacts in Area M are generally characterized by detections of organic and inorganic contaminants in soil. Although specific sources of these contaminants may not be fully understood, historical research related to the operations provided substantive evidence for assessing specific operational areas and selecting target analytes anticipated to be present within the study area.

The analytical results from the SI activities summarized above provide sufficient analytical data and lines of evidence to conclude that the study area is a "Facility" as defined in Section 20101(1)(s) of the NREPA. The following table provides a summary of the affected environmental media, applicable regulatory criteria, and potential receptors within Area M.

| Area M – Media, Criteria, Potential Receptor Summary                |                           |                                     |                |                                                                                                    |                                     |                              |                |                        |            |               |              |                                                        |                              |               |
|---------------------------------------------------------------------|---------------------------|-------------------------------------|----------------|----------------------------------------------------------------------------------------------------|-------------------------------------|------------------------------|----------------|------------------------|------------|---------------|--------------|--------------------------------------------------------|------------------------------|---------------|
| Media                                                               | Soil                      |                                     |                | Groundwater                                                                                        |                                     |                              | Air            |                        | Sediment   | Surface Water |              | Building Materials, Asbestos, and Abandoned Containers |                              |               |
| Criteria                                                            | Drinking Water Protection | Groundwater Surface Water Interface | Direct Contact | Drinking Water Protection                                                                          | Groundwater Surface Water Interface | Flammability and Explosivity | Volatilization | Particulate Inhalation | Ecological | Ecological    | Human Health | Particulate Inhalation                                 | Flammability and Explosivity | Environmental |
| Potential Receptor                                                  |                           |                                     |                |                                                                                                    |                                     |                              |                |                        |            |               |              |                                                        |                              |               |
| Residential Human                                                   |                           | ✓                                   | ✓              |                                                                                                    |                                     |                              |                |                        |            |               |              |                                                        |                              |               |
| Nonresidential Human                                                |                           | ✓                                   | ✓              |                                                                                                    |                                     |                              |                |                        |            |               |              |                                                        |                              |               |
| Water Column Organism                                               |                           |                                     |                |                                                                                                    |                                     |                              |                |                        |            |               |              |                                                        |                              |               |
| Benthic Organism                                                    |                           |                                     |                |                                                                                                    |                                     |                              |                |                        |            |               |              |                                                        |                              |               |
| COCs exceeding applicable regulatory criteria in one or more sample |                           |                                     |                | ARSENIC, COPPER, FLUORANTHENE, NAPHTHALENE (SVOC), PHENANTHRENE, NAPHTHALENE (VOC), XYLENE - TOTAL |                                     |                              |                |                        |            |               |              |                                                        |                              |               |

In addition to the evaluation of analytical results from Area M, the following provides a summary of findings derived from the assessment of Area M with respect to the goals and objectives for the Project:

- Terrestrial sources of contamination are present in the form of inorganic COCs, VOCs, and SVOCs in the study area. The extent of contamination in Area M has not been fully defined or addressed.
- Arsenic concentrations in surface soils at Area M exceed DCC for residential and nonresidential scenarios, potentially leading to unacceptable exposures for users of the property.

### 12.3.2 Recommendations

The conclusions outlined in the preceding subsection establish that Area M is a Part 201 Facility. Section 20107a of Part 201 of NREPA describes the duties of owners or operators of a Facility, regardless of their liability, including: prevent unacceptable exposures, prevent exacerbation, and take reasonable precautions against the foreseeable actions of third parties. Some exceptions may apply; in any case, owners and operators of contaminated properties should become familiar with Section 20107a and the associated Rules.



## FIGURES

### DETAILED FINDINGS REPORT – AREA M

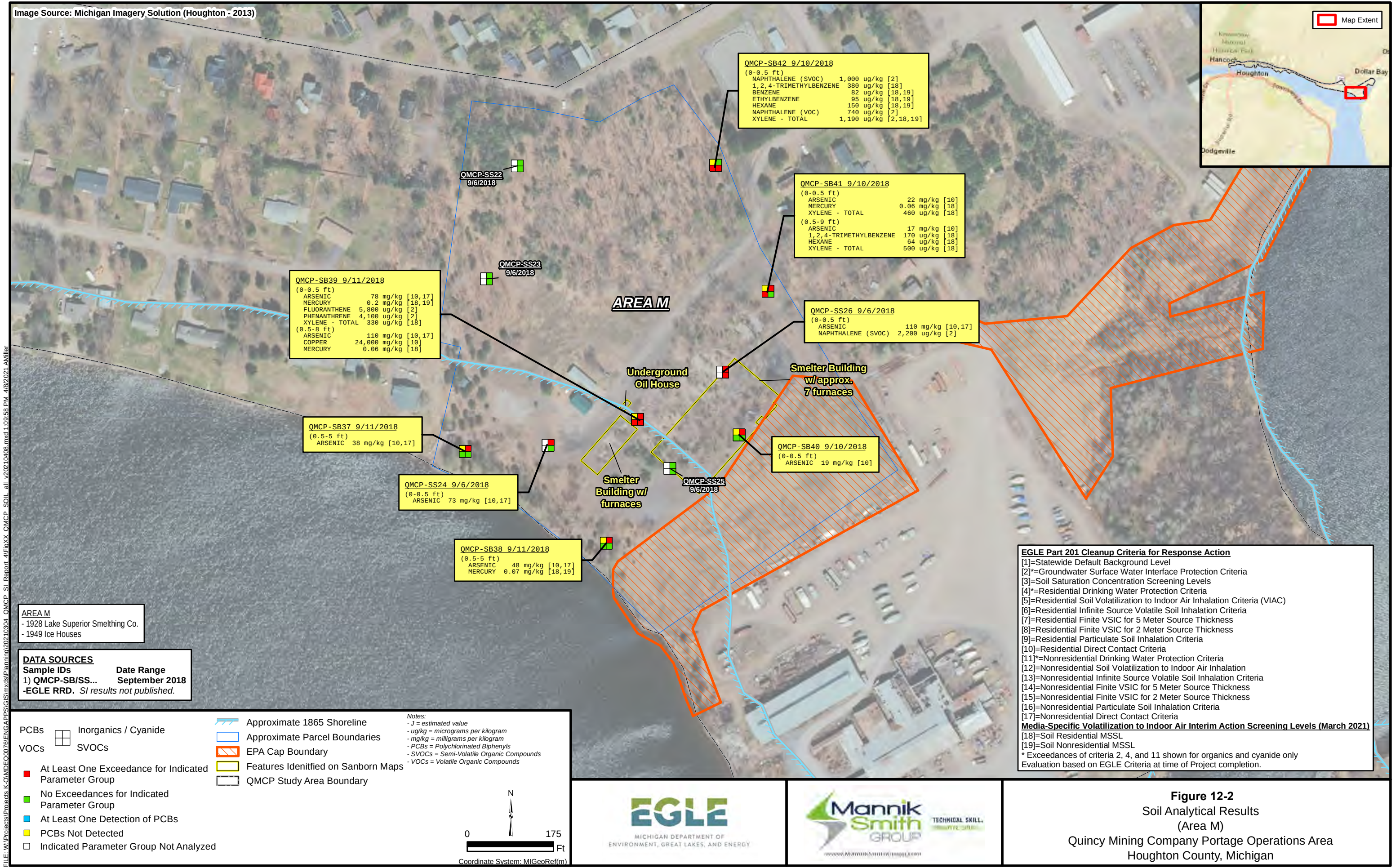




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## TABLES

### DETAILED FINDINGS REPORT – AREA M



TABLE 12-1  
Summary of ACM Analytical Results  
Area M  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Sample Location | Field Sample ID       | Sample Date | Asbestos |    | Friable/ Non-friable | Sample Description | Sample Notes |
|-----------------|-----------------------|-------------|----------|----|----------------------|--------------------|--------------|
| Area M          |                       |             |          |    |                      |                    |              |
| QMCP-ASBBLK58   | QMCP-ASBBLK58A-100118 | 10/1/2018   | ND       | -- | non-friable          | Green roofing      |              |
| QMCP-ASBBLK58   | QMCP-ASBBLK58B-100118 | 10/1/2018   | ND       | -- | non-friable          | Green roofing      |              |

-- = Not Analyzed  
ND = Not detected  
EGLE = Michigan Department of Environment, Great Lakes, and Energy

Results greater than the National Emissions Standard for Hazardous Air Pollutants (NESHAP) and EGLE Particulate Soil Inhalation Criteria of 1% are highlighted yellow.  
Evaluation based on EGLE Criteria at time of Project completion.



TABLE 12-2  
Summary of Soil Analytical Results  
Area M  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code                |            | EGLE Part 201 Generic Cleanup Criteria                                     |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                                  | Area M  |                                                  |                |                     |         |                                                    |                |                  |                |                                                            |                |                              |             |                              |          |                              |             |                                                  |             |
|------------------------------|------------|----------------------------------------------------------------------------|-------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------------------|----------------------------------------------------------------------|------------------------------------------------------|----------------------------------|-----------------------------------------------------------------------------|--------------------------------------------------|---------|--------------------------------------------------|----------------|---------------------|---------|----------------------------------------------------|----------------|------------------|----------------|------------------------------------------------------------|----------------|------------------------------|-------------|------------------------------|----------|------------------------------|-------------|--------------------------------------------------|-------------|
| Station Name                 | CAS Number | [2]<br>Groundwater<br>Surface Water<br>Interface<br>Protection<br>Criteria | [4]<br>Residential<br>Drinking<br>Water<br>Protection<br>Criteria | [5]<br>Residential<br>Soil<br>Volatilization<br>to Indoor Air<br>Inhalation<br>Criteria<br>(VSIC) | [9]<br>Residential<br>Particulate<br>Soil Inhalation<br>Criteria | [10]<br>Residential<br>Direct<br>Contact<br>Criteria | [11]<br>Nonresidential<br>Drinking Water<br>Protection<br>Criteria | [16]<br>Nonresidential<br>Particulate<br>Soil Inhalation<br>Criteria | [17]<br>Nonresidential<br>Direct Contact<br>Criteria | [18]<br>Soil Residential<br>MSSL | [19]<br>Soil<br>Nonresidential<br>MSSL                                      | QMCP-SB37                                        |         |                                                  |                | QMCP-SB38           |         |                                                    |                | QMCP-SB39        |                |                                                            |                | QMCP-SB40                    |             |                              |          | QMCP-SB41                    |             |                                                  |             |
| Field Sample ID              |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | QMCP-SB37 0-6in                                  |         | QMCP-SB37 6in-5ft                                |                | QMCP-SB38 0-6in     |         | QMCP-SB38 6in-5ft                                  |                | QMCP-SB39 0-6in  |                | QMCP-SB39 6in-8ft                                          |                | QMCP-SB40 0-6in              |             | QMCP-SB40 6in-5ft            |          | QMCP-SB41 0-6in              |             | QMCP-SB41 6in-9ft                                |             |
| Sample Date                  |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | 9/11/2018                                        |         | 9/11/2018                                        |                | 9/11/2018           |         | 9/11/2018                                          |                | 9/11/2018        |                | 9/11/2018                                                  |                | 9/10/2018                    |             | 9/10/2018                    |          | 9/10/2018                    |             | 9/10/2018                                        |             |
| Sample Interval (bgs)        |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | 0 - 0.5 ft                                       |         | 0.5 - 5 ft                                       |                | 0 - 0.5 ft          |         | 0.5 - 5 ft                                         |                | 0 - 0.5 ft       |                | 0.5 - 8 ft                                                 |                | 0 - 0.5 ft                   |             | 0.5 - 5 ft                   |          | 0 - 0.5 ft                   |             | 0.5 - 9 ft                                       |             |
| Sample Description           |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | SAND, Fine to medium, brown, saturated at 5 feet |         | SAND, Fine to medium, brown, saturated at 5 feet |                | SAND, Medium, brown |         | SAND, Medium to coarse, brown, saturated at 5 feet |                | SAND, Fine, gray |                | FILL, Gravel, and SAND, Medium, brown, saturated at 8 feet |                | SAND, Medium to coarse, gray |             | SAND, Medium to coarse, gray |          | SAND, Medium to coarse, gray |             | SAND, Fine to medium, brown, saturated at 9 feet |             |
|                              |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | Result                                           | Exceeds | Result                                           | Exceeds        | Result              | Exceeds | Result                                             | Exceeds        | Result           | Exceeds        | Result                                                     | Exceeds        | Result                       | Exceeds     | Result                       | Exceeds  | Result                       | Exceeds     | Result                                           | Exceeds     |
| Inorganics - Metals (mg/kg)  |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |                                                  |         |                                                  |                |                     |         |                                                    |                |                  |                |                                                            |                |                              |             |                              |          |                              |             |                                                  |             |
| ALUMINUM                     | 7429-90-5  | NA                                                                         | 6900 (B)                                                          | NLV                                                                                               | ID                                                               | 50,000 (D,BB)                                        | 6,900 (B)                                                          | ID                                                                   | 3.7E+5 (D,BB)                                        | NA                               | NA                                                                          | NM                                               | --      | NM                                               | --             | NM                  | --      | NM                                                 | --             | NM               | --             | NM                                                         | --             | NM                           | --          | NM                           | --       | NM                           | --          |                                                  |             |
| ANTIMONY                     | 7440-36-0  | 1.2 (X)                                                                    | 4.3                                                               | NLV                                                                                               | 13,000                                                           | 180                                                  | 4.3                                                                | 5,900                                                                | 670                                                  | NA                               | NA                                                                          | NM                                               | --      | NM                                               | --             | NM                  | --      | NM                                                 | --             | NM               | --             | NM                                                         | --             | NM                           | --          | NM                           | --       | NM                           | --          |                                                  |             |
| ARSENIC                      | 7440-38-2  | 4.6                                                                        | 4.6                                                               | NLV                                                                                               | 720                                                              | 7.6                                                  | 4.6                                                                | 910                                                                  | 37                                                   | NA                               | NA                                                                          | 3.6                                              | --      | 38                                               | [2,4,10,11,17] | 2.7                 | --      | 48                                                 | [2,4,10,11,17] | 78               | [2,4,10,11,17] | 110                                                        | [2,4,10,11,17] | 19                           | [2,4,10,11] | 6.2                          | [2,4,11] | 22                           | [2,4,10,11] | 17                                               | [2,4,10,11] |
| BARIUM                       | 7440-39-3  | 130 (B,G)                                                                  | 1,300 (B)                                                         | NLV                                                                                               | 3.3E+5 (B)                                                       | 37,000 (B)                                           | 1,300 (B)                                                          | 1.5E+5 (B)                                                           | 1.3E+5 (B)                                           | NA                               | NA                                                                          | NM                                               | --      | NM                                               | --             | NM                  | --      | NM                                                 | --             | NM               | --             | NM                                                         | --             | NM                           | --          | NM                           | --       | NM                           | --          |                                                  |             |
| BERYLLIUM                    | 7440-41-7  | 24 (G)                                                                     | 51                                                                | NLV                                                                                               | 1,300                                                            | 410                                                  | 51                                                                 | 590                                                                  | 1,600                                                | NA                               | NA                                                                          | NM                                               | --      | NM                                               | --             | NM                  | --      | NM                                                 | --             | NM               | --             | NM                                                         | --             | NM                           | --          | NM                           | --       | NM                           | --          |                                                  |             |
| CADMIUM                      | 7440-43-9  | 1.6 (B,G,X)                                                                | 6.0 (B)                                                           | NLV                                                                                               | 1,700 (B)                                                        | 550 (B)                                              | 6.0 (B)                                                            | 2,200 (B)                                                            | 2,100 (B)                                            | NA                               | NA                                                                          | <0.2 U                                           | --      | <0.2 U                                           | --             | <0.2 U              | --      | <0.2 U                                             | --             | 0.5              | --             | <0.2 U                                                     | --             | <0.2 U                       | --          | <0.2 U                       | --       | <0.2 U                       | --          |                                                  |             |
| CALCIUM                      | 7440-70-2  | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM                                               | --      | NM                                               | --             | NM                  | --      | NM                                                 | --             | NM               | --             | NM                                                         | --             | NM                           | --          | NM                           | --       | NM                           | --          |                                                  |             |
| CHROMIUM                     | 7440-47-3  | 1.2E+6 (B,G,H,X)                                                           | 1.0E+6 (B,D,H)                                                    | NLV                                                                                               | 3.30E+8 (B,H)                                                    | 7.90E+5 (B,H)                                        | 1.00E+6 (B,D,H)                                                    | 1.50E+5 (B,H)                                                        | 1.00E+6 (B,D,H)                                      | NA                               | NA                                                                          | 18                                               | --      | 27                                               | --             | 25                  | --      | 30                                                 | --             | 38               | --             | 44                                                         | --             | 15                           | --          | 15                           | --       | 39                           | --          | 41                                               | --          |
| COBALT                       | 7440-48-4  | 2                                                                          | 0.8                                                               | NLV                                                                                               | 13,000                                                           | 2,600                                                | 2                                                                  | 5,900                                                                | 9,000                                                | NA                               | NA                                                                          | NM                                               | --      | NM                                               | --             | NM                  | --      | NM                                                 | --             | NM               | --             | NM                                                         | --             | NM                           | --          | NM                           | --       | NM                           | --          | NM                                               | --          |
| COPPER                       | 7440-50-8  | 32 (B,G)                                                                   | 5,800 (B)                                                         | NLV                                                                                               | 130,000 (B)                                                      | 20,000 (B)                                           | 5,800 (B)                                                          | 59,000 (B)                                                           | 73,000 (B)                                           | NA                               | NA                                                                          | 270                                              | [2]     | 1,600                                            | [2]            | 610                 | [2]     | 5,100                                              | [2]            | 12,000           | [2,4,11]       | 24,000                                                     | [2,4,10,11]    | 2,300                        | [2]         | 2,000                        | [2]      | 3,800                        | [2]         | 1,800                                            | [2]         |
| IRON                         | 7439-89-6  | --                                                                         | 12,000 (B)                                                        | NLV                                                                                               | ID                                                               | 160,000 (B)                                          | 12,000 (B)                                                         | ID                                                                   | 580,000 (B)                                          | NA                               | NA                                                                          | NM                                               | --      | NM                                               | --             | NM                  | --      | NM                                                 | --             | NM               | --             | NM                                                         | --             | NM                           | --          | NM                           | --       | NM                           | --          | NM                                               | --          |
| LEAD                         | 7439-92-1  | 2,500 (B,G,X)                                                              | 700 (B)                                                           | NLV                                                                                               | 100,000 (B)                                                      | 400 (B)                                              | 700 (B)                                                            | 44,000 (B)                                                           | 900 (B,DD)                                           | NA                               | NA                                                                          | 2.7                                              | --      | 8.7                                              | --             | 3.8                 | --      | 15                                                 | --             | 160              | --             | 30                                                         | --             | 6.5                          | --          | 8.6                          | --       | 25                           | --          | 9.3                                              | --          |
| LITHIUM                      | 7439-93-2  | 9.8 (B)                                                                    | 9.8 (B)                                                           | NLV                                                                                               | 2.30E+9 (B)                                                      | 4,200 (B,DD)                                         | 9.8 (B)                                                            | 1.00E+6 (B)                                                          | 31,000 (B,DD)                                        | NA                               | NA                                                                          | NM                                               | --      | NM                                               | --             | NM                  | --      | NM                                                 | --             | NM               | --             | NM                                                         | --             | NM                           | --          | NM                           | --       | NM                           | --          | NM                                               | --          |
| MAGNESIUM                    | 7439-95-4  | --                                                                         | 8,000 (B)                                                         | NLV                                                                                               | 6.70E+6 (B)                                                      | 1.0E+9 (B,D)                                         | 22,000 (B)                                                         | 2.90E+6 (B)                                                          | 1.00E+6 (B,D)                                        | NA                               | NA                                                                          | NM                                               | --      | NM                                               | --             | NM                  | --      | NM                                                 | --             | NM               | --             | NM                                                         | --             | NM                           | --          | NM                           | --       | NM                           | --          | NM                                               | --          |
| MANGANESE                    | 7439-96-5  | 440 (B,G,X)                                                                | 440 (B)                                                           | NLV                                                                                               | 3,300 (B)                                                        | 25,000 (B)                                           | 440 (B)                                                            | 1,500 (B)                                                            | 90,000 (B)                                           | NA                               | NA                                                                          | 180                                              | --      | 350                                              | --             | 380                 | --      | 320                                                | --             | 360              | --             | 390                                                        | --             | 200                          | --          | 170                          | --       | 280                          | --          | 250                                              | --          |
| MERCURY                      | 7439-97-6  | 0.13 (B,Z)                                                                 | 1.7 (B,Z)                                                         | 48 (B,Z)                                                                                          | 20,000 (B,Z)                                                     | 160 (B,Z)                                            | 1.7 (B,Z)                                                          | 8,800 (B,Z)                                                          | 580 (B,Z)                                            | 0.022 (M)                        | 0.066                                                                       | <0.05 U                                          | --      | <0.05 U                                          | --             | <0.06 U             | --      | 0.07                                               | [18,19]        | 0.2              | [2,18,19]      | 0.06                                                       | [18]           | <0.05 U                      | --          | <0.06 U                      | --       | 0.06                         | [18]        | <0.05 U                                          | --          |
| NICKEL                       | 7440-02-0  | 29 (G)                                                                     | 100 (B)                                                           | NLV                                                                                               | 13,000 (B)                                                       | 40,000 (B)                                           | 100 (B)                                                            | 16,000 (B)                                                           | 1.50E+5 (B)                                          | NA                               | NA                                                                          | NM                                               | --      | NM                                               | --             | NM                  | --      | NM                                                 | --             | NM               | --             | NM                                                         | --             | NM                           | --          | NM                           | --       | NM                           | --          | NM                                               | --          |
| POTASSIUM                    | 7440-09-7  | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM                                               | --      | NM                                               | --             | NM                  | --      | NM                                                 | --             | NM               | --             | NM                                                         | --             | NM                           | --          | NM                           | --       | NM                           | --          | NM                                               | --          |
| SELENIUM                     | 7782-49-2  | 0.41 (B)                                                                   | 4.0 (B)                                                           | NLV                                                                                               | 130,000 (B)                                                      | 2,600 (B)                                            | 4.0 (B)                                                            | 59,000 (B)                                                           | 9,600 (B)                                            | NA                               | NA                                                                          | NM                                               | --      | NM                                               | --             | NM                  | --      | NM                                                 | --             | NM               | --             | NM                                                         | --             | NM                           | --          | NM                           | --       | NM                           | --          | NM                                               | --          |
| SILVER                       | 7440-22-4  | 1.0 (B,M)                                                                  | 4.5 (B)                                                           | NLV                                                                                               | 6700 (B)                                                         | 2500 (B)                                             | 13 (B)                                                             | 2,900 (B)                                                            | 9,000 (B)                                            | NA                               | NA                                                                          | 0.1                                              | --      | 0.6                                              | --             | 0.9                 | --      | 2.5                                                | [2]            | 4.2              | [2]            | 30                                                         | [2,4,11]       | 1.2                          | [2]         | 0.6                          | --       | 1.5                          | [2]         | 0.8                                              | --          |
| SODIUM                       | 7440-23-5  | NA                                                                         | 4,600                                                             | NLV                                                                                               | ID                                                               | 1.0E+6 (D)                                           | NA                                                                 | ID                                                                   | 1.0E+6 (D)                                           | NA                               | NA                                                                          | NM                                               | --      | NM                                               | --             | NM                  | --      | NM                                                 | --             | NM               | --             | NM                                                         | --             | NM                           | --          | NM                           | --       | NM                           | --          | NM                                               | --          |
| VANADIUM                     | 7440-62-2  | 430                                                                        | 72                                                                | NLV                                                                                               | ID                                                               | 750 (DD)                                             | 990                                                                | ID                                                                   | 5,500 (DD)                                           | NA                               | NA                                                                          | NM                                               | --      | NM                                               | --             | NM                  | --      | NM                                                 | --             | NM               | --             | NM                                                         | --             | NM                           | --          | NM                           | --       | NM                           | --          | NM                                               | --          |
| ZINC                         | 7440-66-6  | 62 (B,G)                                                                   | 2,400 (B)                                                         | NLV                                                                                               | ID                                                               | 1.70E+5 (B)                                          | 5,000 (B)                                                          | ID                                                                   | 6.30E+5 (B)                                          | NA                               | NA                                                                          | 25                                               | --      | 53                                               | --             | 43                  | --      | 54                                                 | --             | 160              | [2]            | 84                                                         | [2]            | 34                           | --          | 25                           | --       | 80                           | [2]         | 65                                               | [2]         |
| Inorganics - Cyanide (mg/kg) |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |                                                  |         |                                                  |                |                     |         |                                                    |                |                  |                |                                                            |                |                              |             |                              |          |                              |             |                                                  |             |
| CYANIDE                      | 57-12-5    | 0.1 (P,R)                                                                  | 4.0 (P,R)                                                         | NLV                                                                                               | 250 (P,R)                                                        | 12 (P,R)                                             | 4.0 (P,R)                                                          | 250 (P,R)                                                            | 250 (P,R)                                            | NA                               | NA                                                                          | NM                                               | --      | NM                                               | --             | NM                  | --      | NM                                                 | --             | NM               | --             | NM                                                         | --             | NM                           | --          | NM                           | --       | NM                           | --          | NM                                               | --          |
| Organics - PCBs (ug/kg)      |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |                                                  |         |                                                  |                |                     |         |                                                    |                |                  |                |                                                            |                |                              |             |                              |          |                              |             |                                                  |             |
| AROCLOR-1260                 | 11096-82-5 | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | <110 U                                           | --      | <110 U                                           | --             | <110 U              | --      | <110 U                                             | --             | <550 U           | --             | <110 U                                                     | --             | <100 U                       | --          | <110 U                       | --       | <530 U                       | --          | <110 U                                           | --          |
| AROCLOR-1262                 | 37324-23-5 | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | <110 U                                           | --      | <110 U                                           | --             | <110 U              | --      | <110 U                                             | --             | <550 U           | --             | <110 U                                                     | --             | <100 U                       | --          | <110 U                       | --       | <530 U                       | --          | <110 U                                           | --          |
| TOTAL PCBs                   | 1336-36-6  | NLL                                                                        | NLL                                                               | 3.00E+6 (J,T)                                                                                     | 5.20E+6 (J,T)                                                    | 1,000 (J,T)                                          | NLL                                                                | 6.50E+6 (J,T)                                                        | 1,000 (J,T)                                          | NA                               | NA                                                                          | ND                                               | --      | ND                                               | --             | ND                  | --      | ND                                                 | --             | ND               | --             | ND                                                         | --             | ND                           | --          | ND                           | --       | ND                           | --          | ND                                               | --          |
| Organics - SVOCs (ug/kg)     |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |                                                  |         |                                                  |                |                     |         |                                                    |                |                  |                |                                                            |                |                              |             |                              |          |                              |             |                                                  |             |
| 1,1-BIPHENYL                 | 92-52-4    | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM                                               | --      | NM                                               | --             | NM                  | --      | NM                                                 | --             | NM               | --             | NM                                                         | --             | NM                           | --          | NM                           | --       | NM                           | --          | NM                                               | --          |
| 2-METHYLNAPHTHALENE (SVOC)   | 91-57-6S   | 4,200                                                                      | 57,000                                                            | 2.70E+06                                                                                          | 6.70E+08                                                         | 8.10E+06                                             | 1.70E+05                                                           | 2.90E+08                                                             | 2.60E+07                                             | NA                               | NA                                                                          | <540 U                                           | --      | <540 U                                           | --             | <550 U              | --      | <540 U                                             | --             | <550 U           | --             | <530 U                                                     | --             | <520 U                       | --          | <550 U                       | --       | 1,000                        | --          | <530 U                                           | --          |
| ACENAPHTHENE                 | 83-32-9    | 8,700                                                                      | 3.00E+05                                                          | 1.90E+08                                                                                          | 1.40E+10                                                         | 4.10E+07                                             | 8.80E+05                                                           | 6.20E+09                                                             | 1.30E+08                                             | NA                               | NA                                                                          | <210 U                                           | --      | <220 U                                           | --             | <220 U              | --      | <220 U                                             | --             | <220 U           | --             | <210 U                                                     | --             | <210 U                       | --          | <220 U                       | --       | <210 U                       | --          | <210 U                                           | --          |
| ACENAPHTHYLENE               | 208-96-8   | ID                                                                         | 5,900                                                             | 1.60E+06                                                                                          | 2.30E+09                                                         | 1.60E+06                                             | 17,000                                                             | 1.00E+09                                                             | 5.20E+06                                             | NA                               | NA                                                                          | <210 U                                           | --      | <220 U                                           | --             | <220 U              | --      | <220 U                                             | --             | <220 U           | --             | <210 U                                                     | --             | <210 U                       | --          | 230                          | --       | <210 U                       | --          | <210 U                                           | --          |
| ACETOPHENONE                 | 98-86-2    | ID                                                                         | 30,000                                                            | 1.20E+8 (C)                                                                                       | 3.30E+10                                                         | 4.70E+7 (C)                                          | 88,000                                                             | 1.40E+10                                                             | 1.50E+8 (C)                                          | NA                               | NA                                                                          | NM                                               | --      | NM                                               | --             | NM                  | --      | NM                                                 | --             | NM               | --             | NM                                                         | --             | NM                           | --          | NM                           | --       | NM                           | --          | NM                                               | --          |
| ANTHRACENE                   | 120-12-7   | ID                                                                         | 41,000                                                            | 1.00E+9 (D)                                                                                       | 6.70E+10                                                         | 2.30E+08                                             | 41,000                                                             | 2.90E+10                                                             | 7.30E+08                                             | NA                               | NA                                                                          | <210 U                                           | --      | <220 U                                           | --             | <220 U              | --      | <220 U                                             | --             | 560              | --             | <210 U                                                     | --             | <210 U                       | --          | <220 U                       | --       | <210 U                       | --          | <210 U                                           | --          |
| BENZALDEHYDE                 | 100-52-7   | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM                                               | --      | NM                                               | --             | NM                  | --      | NM                                                 | --             | NM               | --             | NM                                                         | --             | NM                           | --          | NM                           | --       | NM                           | --          | NM                                               | --          |
| BENZO(A)ANTHRACENE           | 56-55-3    | NLL                                                                        | NLL                                                               | NLV                                                                                               | ID                                                               | 20,000 (Q)                                           | NLL                                                                | ID                                                                   | 80,000 (Q)                                           | NA                               | NA                                                                          | <210 U                                           | --      | <220 U                                           | --             | <220 U              | --      | 220                                                | --             | 2,500            | --             | 960                                                        | --             | <210 U                       | --          | <220 U                       | --       | 660                          | --          | <210 U                                           | --          |
| BENZO(A)PYRENE               | 50-32-8    | NLL                                                                        | NLL                                                               | NLV                                                                                               | 1.50E+8 (Q)                                                      | 2,000 (Q)                                            | NLL                                                                | 1.90E+6 (Q)                                                          | 8,000 (Q)                                            | NA                               | NA                                                                          | <430 U                                           | --      | <430 U                                           | --             | <440 U              | --      | <430 U                                             | --             | 2,000            | --             | 690                                                        | --             | <420 U                       | --          | <440 U                       | --       | 580                          | --          | <430 U                                           | --          |
| BENZO(B)FLUORANTHENE         | 205-99-2   | NLL                                                                        | NLL                                                               | ID                                                                                                | 20,000 (Q)                                                       | NLL                                                  | ID                                                                 | 80,000 (Q)                                                           | NA                                                   | NA                               | NA                                                                          | <430 U                                           | --      | <430 U                                           | --             | <440 U              | --      | 710                                                | --             | 4,200            | --             | 1,400                                                      | --             | <420 U                       | --          | <440 U                       | --       | 1,200                        | --          | <430 U                                           | --          |
| BENZO(G,H,I)PERYLENE         | 191-24-2   | NLL                                                                        | NLL                                                               | NLV                                                                                               | 8.00E+08                                                         | 2.50E+06                                             | NLL                                                                | 3.50E+08                                                             | 7.00E+06                                             | NA                               | NA                                                                          | <430 U                                           | --      | <430 U                                           | --             | <440 U              | --      | <4                                                 |                |                  |                |                                                            |                |                              |             |                              |          |                              |             |                                                  |             |

TABLE 12-2  
Summary of Soil Analytical Results  
Area M  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code                      |            | EGLE Part 201 Generic Cleanup Criteria                                     |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                        | Area M                                           |         |                                                  |         |                     |         |                                                    |         |                  |         |                                                            |         |                              |         |                              |         |                              |         |                                                  |         |
|------------------------------------|------------|----------------------------------------------------------------------------|-------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------------------|----------------------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------------------------------|----------------------------------------|--------------------------------------------------|---------|--------------------------------------------------|---------|---------------------|---------|----------------------------------------------------|---------|------------------|---------|------------------------------------------------------------|---------|------------------------------|---------|------------------------------|---------|------------------------------|---------|--------------------------------------------------|---------|
| Station Name                       | CAS Number | [2]<br>Groundwater<br>Surface Water<br>Interface<br>Protection<br>Criteria | [4]<br>Residential<br>Drinking<br>Water<br>Protection<br>Criteria | [5]<br>Residential<br>Soil<br>Volatilization<br>to Indoor Air<br>Inhalation<br>Criteria<br>(VSIC) | [9]<br>Residential<br>Particulate<br>Soil Inhalation<br>Criteria | [10]<br>Residential<br>Direct<br>Contact<br>Criteria | [11]<br>Nonresidential<br>Drinking Water<br>Protection<br>Criteria | [16]<br>Nonresidential<br>Particulate<br>Soil Inhalation<br>Criteria | [17]<br>Nonresidential<br>Direct Contact<br>Criteria | [18]<br>Soil Residential<br>MSSL                                            | [19]<br>Soil<br>Nonresidential<br>MSSL | QMCP-SB37                                        |         |                                                  |         | QMCP-SB38           |         |                                                    |         | QMCP-SB39        |         |                                                            |         | QMCP-SB40                    |         |                              |         | QMCP-SB41                    |         |                                                  |         |
| Field Sample ID                    |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                                                             |                                        | QMCP-SB37 0-6in                                  |         | QMCP-SB37 6in-5ft                                |         | QMCP-SB38 0-6in     |         | QMCP-SB38 6in-5ft                                  |         | QMCP-SB39 0-6in  |         | QMCP-SB39 6in-8ft                                          |         | QMCP-SB40 0-6in              |         | QMCP-SB40 6in-5ft            |         | QMCP-SB41 0-6in              |         | QMCP-SB41 6in-9ft                                |         |
| Sample Date                        |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                                                             |                                        | 9/11/2018                                        |         | 9/11/2018                                        |         | 9/11/2018           |         | 9/11/2018                                          |         | 9/11/2018        |         | 9/11/2018                                                  |         | 9/10/2018                    |         | 9/10/2018                    |         | 9/10/2018                    |         | 9/10/2018                                        |         |
| Sample Interval (bgs)              |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                                                             |                                        | 0 - 0.5 ft                                       |         | 0.5 - 5 ft                                       |         | 0 - 0.5 ft          |         | 0.5 - 5 ft                                         |         | 0 - 0.5 ft       |         | 0.5 - 8 ft                                                 |         | 0 - 0.5 ft                   |         | 0.5 - 5 ft                   |         | 0 - 0.5 ft                   |         | 0.5 - 9 ft                                       |         |
| Sample Description                 |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                                                             |                                        | SAND, Fine to medium, brown, saturated at 5 feet |         | SAND, Fine to medium, brown, saturated at 5 feet |         | SAND, Medium, brown |         | SAND, Medium to coarse, brown, saturated at 5 feet |         | SAND, Fine, gray |         | FILL, Gravel, and SAND, Medium, brown, saturated at 8 feet |         | SAND, Medium to coarse, gray |         | SAND, Medium to coarse, gray |         | SAND, Medium to coarse, gray |         | SAND, Fine to medium, brown, saturated at 9 feet |         |
|                                    |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                                                             |                                        | Result                                           | Exceeds | Result                                           | Exceeds | Result              | Exceeds | Result                                             | Exceeds | Result           | Exceeds | Result                                                     | Exceeds | Result                       | Exceeds | Result                       | Exceeds | Result                       | Exceeds | Result                                           | Exceeds |
| Organics - SVOCs (ug/kg) Continued |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                                                             |                                        |                                                  |         |                                                  |         |                     |         |                                                    |         |                  |         |                                                            |         |                              |         |                              |         |                              |         |                                                  |         |
| DIBENZO(A,H)ANTHRACENE             | 53-70-3    | NLL                                                                        | NLL                                                               | NLV                                                                                               | ID                                                               | 2,000 (Q)                                            | NLL                                                                | ID                                                                   | 8,000 (Q)                                            | NA                                                                          | NA                                     | <430 U                                           | --      | <430 U                                           | --      | <440 U              | --      | <430 U                                             | --      | <440 U           | --      | <420 U                                                     | --      | <420 U                       | --      | <440 U                       | --      | <430 U                       | --      | <430 U                                           | --      |
| DIBENZOFURAN                       | 132-64-9   | 1,700                                                                      | ID                                                                | 2.00E+06                                                                                          | 6.70E+06                                                         | ID                                                   | ID                                                                 | 2.90E+06                                                             | ID                                                   | NA                                                                          | NA                                     | NM                                               | --      | NM                                               | --      | NM                  | --      | NM                                                 | --      | NM               | --      | NM                                                         | --      | NM                           | --      | NM                           | --      | NM                           | --      | NM                                               | --      |
| FLUORANTHENE                       | 206-44-0   | 5,500                                                                      | 730,000                                                           | 1.00E+9 (D)                                                                                       | 9.30E+09                                                         | 4.60E+07                                             | 730,000                                                            | 4.10E+09                                                             | 1.30E+08                                             | NA                                                                          | NA                                     | <210 U                                           | --      | <220 U                                           | --      | <220 U              | --      | 400                                                | --      | 5,800            | [2]     | 1,600                                                      | --      | <210 U                       | --      | 220                          | --      | 1,100                        | --      | <210 U                                           | --      |
| FLUORENE                           | 86-73-7    | 5,300                                                                      | 390,000                                                           | 5.80E+08                                                                                          | 9.30E+09                                                         | 2.70E+07                                             | 890,000                                                            | 4.10E+09                                                             | 8.70E+07                                             | NA                                                                          | NA                                     | <210 U                                           | --      | <220 U                                           | --      | <220 U              | --      | <220 U                                             | --      | <220 U           | --      | <210 U                                                     | --      | <210 U                       | --      | <220 U                       | --      | <210 U                       | --      | <210 U                                           | --      |
| INDENO(1,2,3-CD)PYRENE             | 193-39-5   | NLL                                                                        | NLL                                                               | NLV                                                                                               | ID                                                               | 20,000 (Q)                                           | NLL                                                                | ID                                                                   | 80,000 (Q)                                           | NA                                                                          | NA                                     | <430 U                                           | --      | <430 U                                           | --      | <440 U              | --      | <430 U                                             | --      | 770              | --      | <420 U                                                     | --      | <420 U                       | --      | <440 U                       | --      | <430 U                       | --      | <430 U                                           | --      |
| NAPHTHALENE (SVOC)                 | 91-20-3S   | 730                                                                        | 35,000                                                            | 2.50E+05                                                                                          | 2.00E+08                                                         | 1.60E+07                                             | 1.00E+05                                                           | 8.80E+07                                                             | 5.20E+07                                             | NA                                                                          | NA                                     | <210 U                                           | --      | <220 U                                           | --      | <220 U              | --      | 290                                                | --      | 400              | --      | <210 U                                                     | --      | 250                          | --      | 700                          | --      | 700                          | --      | 270                                              | --      |
| PHENANTHRENE                       | 85-01-8    | 2,100                                                                      | 56,000                                                            | 2.80E+06                                                                                          | 6.70E+06                                                         | 1.60E+06                                             | 1.60E+05                                                           | 2.90E+06                                                             | 5.20E+06                                             | NA                                                                          | NA                                     | <210 U                                           | --      | <220 U                                           | --      | <220 U              | --      | 360                                                | --      | 4,100            | [2]     | 690                                                        | --      | <210 U                       | --      | 370                          | --      | 790                          | --      | 210                                              | --      |
| PYRENE                             | 129-00-0   | ID                                                                         | 4.80E+05                                                          | 1.00E+9 (D)                                                                                       | 6.70E+09                                                         | 2.90E+07                                             | 4.80E+05                                                           | 2.90E+09                                                             | 8.40E+07                                             | NA                                                                          | NA                                     | <210 U                                           | --      | <220 U                                           | --      | <220 U              | --      | 320                                                | --      | 4,600            | --      | 1,500                                                      | --      | <210 U                       | --      | <220 U                       | --      | 900                          | --      | <210 U                                           | --      |
| Organics - VOCs (ug/kg)            |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                                                             |                                        |                                                  |         |                                                  |         |                     |         |                                                    |         |                  |         |                                                            |         |                              |         |                              |         |                              |         |                                                  |         |
| 1,2,3-TRIMETHYLBENZENE             | 526-73-8   | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | 270 (JT)                                                                    | 800 (JT)                               | <66 U                                            | --      | <56 U                                            | --      | <67 U               | --      | <56 U                                              | --      | <57 U            | --      | <59 U                                                      | --      | <53 U                        | --      | <65 U                        | --      | 62                           | --      | 110                                              | --      |
| 1,2,4-TRIMETHYLBENZENE             | 95-63-6    | 570 (I)                                                                    | 2,100 (I)                                                         | 4.3E+6 (C,I)                                                                                      | 8.20E+10 (I)                                                     | 3.2E+07 (C,I)                                        | 2,100 (I)                                                          | 3.60E+10 (I)                                                         | 1.00E+8 (C,I)                                        | 150 (JT)                                                                    | 430 (JT)                               | <66 U                                            | --      | 76                                               | --      | <67 U               | --      | 83                                                 | --      | 89               | --      | <59 U                                                      | --      | 68                           | --      | <65 U                        | --      | 150                          | --      | 170                                              | [18]    |
| 1,3,5-TRIMETHYLBENZENE             | 108-67-8   | 1,100 (I)                                                                  | 1,800 (I)                                                         | 2.6E+6 (C,I)                                                                                      | 8.20E+10 (I)                                                     | 3.2E+07 (C)                                          | 2,100 (I)                                                          | 3.60E+10 (I)                                                         | 1.00E+8 (C,I)                                        | 100 (JT)                                                                    | 300 (JT)                               | <66 U                                            | --      | <56 U                                            | --      | <67 U               | --      | <56 U                                              | --      | <57 U            | --      | <59 U                                                      | --      | <53 U                        | --      | <65 U                        | --      | <62 U                        | --      | <62 U                                            | --      |
| 2,2,4-TRIMETHYLPENTANE             | 540-84-1   | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                                                                          | NA                                     | <330 U                                           | --      | <280 U                                           | --      | <330 U              | --      | <280 U                                             | --      | <290 U           | --      | <300 U                                                     | --      | <270 U                       | --      | <330 U                       | --      | <310 U                       | --      | <310 U                                           | --      |
| 2-METHYLNAPHTHALENE (VOC)          | 91-57-6V   | 4,200                                                                      | 57,000                                                            | 2.70E+06                                                                                          | 6.70E+08                                                         | 8.10E+06                                             | 1.70E+05                                                           | 2.90E+08                                                             | 2.60E+07                                             | NA                                                                          | NA                                     | <330 U                                           | --      | <280 U                                           | --      | <330 U              | --      | <280 U                                             | --      | <290 U           | --      | <300 U                                                     | --      | <270 U                       | --      | <330 U                       | --      | 400                          | --      | 330                                              | --      |
| BENZENE                            | 71-43-2    | 240 (I,X)                                                                  | 100 (I)                                                           | 1,600 (I)                                                                                         | 3.80E+8 (I)                                                      | 1.8E+5 (I)                                           | 100 (I)                                                            | 4.70E+8 (I)                                                          | 8.40E+5 (C,I)                                        | 1.7 (M)                                                                     | 7.9 (M)                                | <66 U                                            | --      | <56 U                                            | --      | <67 U               | --      | <56 U                                              | --      | <57 U            | --      | <59 U                                                      | --      | <53 U                        | --      | <65 U                        | --      | <62 U                        | --      | <62 U                                            | --      |
| CYCLOHEXANE                        | 110-82-7   | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                                                                          | NA                                     | <330 U                                           | --      | <280 U                                           | --      | <330 U              | --      | <280 U                                             | --      | <290 U           | --      | <300 U                                                     | --      | <270 U                       | --      | <330 U                       | --      | <310 U                       | --      | <310 U                                           | --      |
| ETHYLBENZENE                       | 100-41-4   | 360                                                                        | 1,500                                                             | 87,000                                                                                            | 1.00E+10                                                         | 2.20E+07                                             | 1,500                                                              | 1.30E+10                                                             | 7.10E+07                                             | 12 (M)                                                                      | 57                                     | <66 U                                            | --      | <56 U                                            | --      | <67 U               | --      | <56 U                                              | --      | <57 U            | --      | <59 U                                                      | --      | <53 U                        | --      | <65 U                        | --      | <62 U                        | --      | <62 U                                            | --      |
| HEXANE                             | 110-54-3   | NA                                                                         | 1.8E+5 (C)                                                        | 5.1E+5 (C)                                                                                        | 1.30E+10                                                         | 9.2E+7 (C)                                           | 5.10E+5 (C)                                                        | 5.90E+09                                                             | 3.00E+8 (C)                                          | 25                                                                          | 74                                     | <66 U                                            | --      | <56 UJ                                           | --      | <67 UJ              | --      | <56 UJ                                             | --      | <57 U            | --      | <59 U                                                      | --      | <53 U                        | --      | <65 U                        | --      | <62 U                        | --      | 64                                               | [18]    |
| ISOPROPYLBENZENE                   | 98-82-8    | 3,200                                                                      | 91,000                                                            | 4.00E+5 (C)                                                                                       | 5.80E+09                                                         | 2.50E+7 (C)                                          | 2.60E+05                                                           | 2.60E+09                                                             | 8.00E+7 (C)                                          | NA                                                                          | NA                                     | <66 U                                            | --      | <56 U                                            | --      | <67 U               | --      | <56 U                                              | --      | <57 U            | --      | <59 U                                                      | --      | <53 U                        | --      | <65 U                        | --      | <62 U                        | --      | <62 U                                            | --      |
| M,P-XYLENE                         | 1330-20-7  | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                                                                          | NA                                     | <130 U                                           | --      | 150                                              | --      | <130 U              | --      | <110 U                                             | --      | 200              | --      | <120 U                                                     | --      | 110                          | --      | <130 U                       | --      | 260                          | --      | 300                                              | --      |
| NAPHTHALENE (VOC)                  | 91-20-3V   | 730                                                                        | 35,000                                                            | 2.50E+05                                                                                          | 2.00E+08                                                         | 1.60E+07                                             | 1.00E+05                                                           | 8.80E+07                                                             | 5.20E+07                                             | NA                                                                          | NA                                     | <330 U                                           | --      | <280 U                                           | --      | <330 U              | --      | <280 U                                             | --      | <290 U           | --      | <300 U                                                     | --      | <270 U                       | --      | <330 U                       | --      | 320                          | --      | <310 U                                           | --      |
| N-PROPYLBENZENE                    | 103-65-1   | ID                                                                         | 1,600 (I)                                                         | ID                                                                                                | 1.30E+9 (I)                                                      | 2.50E+6 (I)                                          | 4,600                                                              | 5.90E+08                                                             | 8.00E+06                                             | 1,800                                                                       | 3,500                                  | <66 U                                            | --      | <56 U                                            | --      | <67 U               | --      | <56 U                                              | --      | <57 U            | --      | <59 U                                                      | --      | <53 U                        | --      | <65 U                        | --      | <62 U                        | --      | <62 U                                            | --      |
| O-XYLENE                           | 95-47-6    | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                                                                          | NA                                     | <66 U                                            | --      | 100                                              | --      | <67 U               | --      | 65                                                 | --      | 130              | --      | <59 U                                                      | --      | 77                           | --      | <65 U                        | --      | 200                          | --      | 200                                              | --      |
| P-ISOPROPYL TOLUENE (p-CYMENTHENE) | 99-87-6    | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                                                                          | NA                                     | NM                                               | --      | NM                                               | --      | NM                  | --      | NM                                                 | --      | NM               | --      | NM                                                         | --      | NM                           | --      | NM                           | --      | NM                           | --      | NM                                               | --      |
| SEC-BUTYLBENZENE                   | 135-98-8   | ID                                                                         | 1,600                                                             | ID                                                                                                | 4.00E+08                                                         | 2.50E+06                                             | 4,600                                                              | 1.80E+08                                                             | 8.00E+06                                             | NA                                                                          | NA                                     | <66 U                                            | --      | <56 U                                            | --      | <67 U               | --      | <56 U                                              | --      | <57 U            | --      | <59 U                                                      | --      | <53 U                        | --      | <65 U                        | --      | <62 U                        | --      | <62 U                                            | --      |
| STYRENE                            | 100-42-5   | 530 (X)                                                                    | 2,700                                                             | 2.50E+05                                                                                          | 5.50E+09                                                         | 4.00E+05                                             | 2,700                                                              | 6.90E+09                                                             | 1.90E+6 (C)                                          | NA                                                                          | NA                                     | <66 U                                            | --      | <56 U                                            | --      | <67 U               | --      | <56 U                                              | --      | <57 U            | --      | <59 U                                                      | --      | <53 U                        | --      | <65 U                        | --      | <62 U                        | --      | <62 U                                            | --      |
| TETRACHLOROETHYLENE                | 127-18-4   | 220 (X)                                                                    | 100                                                               | 11,000                                                                                            | 2.70E+09                                                         | 2.0E+5 (C)                                           | 100                                                                | 1.20E+09                                                             | 9.30E+5 (C)                                          | 6.2 (M)                                                                     | 12 (M)                                 | <66 U                                            | --      | <56 U                                            | --      | <67 U               | --      | <56 U                                              | --      | <57 U            | --      | <59 U                                                      | --      | <53 U                        | --      | <65 U                        | --      | <62 U                        | --      | <62 U                                            | --      |
| TOLUENE                            | 108-88-3   | 5,400 (I)                                                                  | 16,000 (I)                                                        | 3.30E+5 (C,I)                                                                                     | 2.70E+10 (I)                                                     | 5E+07 (C,I)                                          | 16,000 (I)                                                         | 1.20E+10 (I)                                                         | 1.60E+8 (C,I)                                        | 3,700                                                                       | 11,000                                 | <66 U                                            | --      | 110                                              | --      | <67 U               | --      | 55 J                                               | --      | 150              | --      | <59 U                                                      | --      | 93                           | --      | <65 U                        | --      | 200                          | --      | 230                                              | --      |
| XYLENE - TOTAL                     | 1330-20-7  | 980 (I)                                                                    | 5,600 (I)                                                         | 6.30E+6 (I)                                                                                       | 2.90E+11 (I)                                                     | 4.1E+08 (C,I)                                        | 5,600 (I)                                                          | 1.30E+11 (I)                                                         | 1.00E+9 (C,D,I)                                      | 280 (J)                                                                     | 830 (J)                                | ND                                               | --      | 250                                              | --      | ND                  | --      | 65                                                 | --      | 330              | [18]    | ND                                                         | --      | 187                          | --      | ND                           | --      | 460                          | [18]    | 500                                              | [18]    |
| Organics - Pesticides (ug/kg)      |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                                                             |                                        |                                                  |         |                                                  |         |                     |         |                                                    |         |                  |         |                                                            |         |                              |         |                              |         |                              |         |                                                  |         |
| 4,4-DDE                            | 72-55-9    | NLL                                                                        | NLL                                                               | NLV                                                                                               | 3.20E+07                                                         | 45,000                                               | NLL                                                                | 4.00E+07                                                             | 1.90E+05                                             | NA                                                                          | NA                                     | NM                                               | --      | NM                                               | --      | NM                  | --      | NM                                                 | --      | NM               | --      | NM                                                         | --      | NM                           | --      | NM                           | --      | NM                           | --      | NM                                               | --      |
| 4,4-DDT                            | 50-29-3    | NLL                                                                        | NLL                                                               | NLV                                                                                               | 3.20E+07                                                         | 57,000                                               | NLL                                                                | 4.00E+07                                                             | 2.80E+05                                             | NA                                                                          | NA                                     | NM                                               | --      | NM                                               | --      | NM                  | --      | NM                                                 | --      | NM               | --      | NM                                                         | --      | NM                           | --      | NM                           | --      | NM                           | --      | NM                                               | --      |
| ALDRIN                             | 309-00-2   | NLL                                                                        | NLL                                                               | 1.30E+06                                                                                          | 6.40E+05                                                         | 1,000                                                | NLL                                                                | 8.00E+05                                                             | 4,300                                                | NA                                                                          | NA                                     | NM                                               | --      | NM                                               | --      | NM                  | --      | NM                                                 | --      | NM               | --      | NM                                                         | --      | NM                           | --      | NM                           | --      | NM                           | --      | NM                                               | --      |
| ALPHA-CHLORDANE                    | 5103-71-9  | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                                                                          | NA                                     | NM                                               | --      | NM                                               | --      | NM                  | --      | NM                                                 | --      | NM               | --      | NM                                                         | --      | NM                           | --      | NM                           | --      | NM                           | --      | NM                                               | --      |
| BETA-BHC                           | 319-85-7   | ID                                                                         | 37                                                                | NLV                                                                                               | 5.90E+06                                                         | 5,400                                                | 150                                                                | 7.40E+06                                                             | 25,000                                               | NA                                                                          | NA                                     | NM                                               | --      | NM                                               | --      | NM                  | --      | NM                                                 | --      | NM               | --      | NM                                                         | --      | NM                           | --      | NM                           | --      | NM                           | --      | NM                                               | --      |
| ENDOSULFAN I                       | 959-98-8   | NLL                                                                        | NLL                                                               | ID                                                                                                | ID                                                               | 1.4E+06 (J)                                          | NLL                                                                | ID                                                                   | 4.40E+06 (J)                                         | NA                                                                          | NA                                     | NM                                               | --      | NM                                               | --      | NM                  | --      | NM                                                 | --      | NM               | --      | NM                                                         | --      | NM                           | --      | NM                           | --      | NM                           | --      | NM                                               | --      |
| ENDRIN KETONE                      | 53494-70-5 | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                                                                          | NA                                     | NM                                               |         |                                                  |         |                     |         |                                                    |         |                  |         |                                                            |         |                              |         |                              |         |                              |         |                                                  |         |

TABLE 12-2  
Summary of Soil Analytical Results  
Area M  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code                |            | EGLE Part 201 Generic Cleanup Criteria                                     |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                              | Area M   |                                                    |         |                                                    |          |                                                    |          |                           |         |                                                    |                |                                |          |                                |         |                                                   |                |                                                   |         |
|------------------------------|------------|----------------------------------------------------------------------------|-------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------------------|----------------------------------------------------------------------|------------------------------------------------------|----------------------------------|-----------------------------------------------------------------------------|------------------------------|----------|----------------------------------------------------|---------|----------------------------------------------------|----------|----------------------------------------------------|----------|---------------------------|---------|----------------------------------------------------|----------------|--------------------------------|----------|--------------------------------|---------|---------------------------------------------------|----------------|---------------------------------------------------|---------|
| Station Name                 | CAS Number | [2]<br>Groundwater<br>Surface Water<br>Interface<br>Protection<br>Criteria | [4]<br>Residential<br>Drinking<br>Water<br>Protection<br>Criteria | [5]<br>Residential<br>Soil<br>Volatilization<br>to Indoor Air<br>Inhalation<br>Criteria<br>(VSIc) | [9]<br>Residential<br>Particulate<br>Soil Inhalation<br>Criteria | [10]<br>Residential<br>Direct<br>Contact<br>Criteria | [11]<br>Nonresidential<br>Drinking Water<br>Protection<br>Criteria | [16]<br>Nonresidential<br>Particulate<br>Soil Inhalation<br>Criteria | [17]<br>Nonresidential<br>Direct Contact<br>Criteria | [18]<br>Soil Residential<br>MSSL | [19]<br>Soil Nonresidential<br>MSSL                                         | QMCP-SB42                    |          |                                                    |         | QMCP-SS22                                          |          |                                                    |          | QMCP-SS23                 |         | QMCP-SS24                                          |                | QMCP-SS25                      |          |                                |         | QMCP-SS26                                         |                |                                                   |         |
| Field Sample ID              |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | QMCP-SB42 0-6in              |          | QMCP-SB42 6in-12ft                                 |         | QMCP-SS-22-0-6in                                   |          | QMCP-SS-22-0-6in DUP3                              |          | QMCP-SS-23-0-6in          |         | QMCP-SS-24-0-6in                                   |                | QMCP-SS-25-0-6in               |          | QMCP-SS25-0-6in                |         | QMCP-SS-26-0-6in                                  |                | QMCP-SS26-0-6in                                   |         |
| Sample Date                  |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | 9/10/2018                    |          | 9/10/2018                                          |         | 9/6/2018                                           |          | 9/6/2018                                           |          | 9/6/2018                  |         | 9/6/2018                                           |                | 9/6/2018                       |          | 9/6/2018                       |         | 9/6/2018                                          |                | 9/6/2018                                          |         |
| Sample Interval (bgs)        |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | 0 - 0.5 ft                   |          | 0.5 - 12 ft                                        |         | 0 - 0.5 ft                                         |          | 0 - 0.5 ft                                         |          | 0 - 0.5 ft                |         | 0 - 0.5 ft                                         |                | 0 - 0.5 ft                     |          | 0 - 0.5 ft                     |         | 0 - 0.5 ft                                        |                | 0 - 0.5 ft                                        |         |
| Sample Description           |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | SAND, Medium to coarse, gray |          | SAND, Medium to coarse, brown, saturated at 12 fee |         | Dark brown TOPSOIL to 5in, then brown fine to medi |          | Dark brown TOPSOIL to 5in, then brown fine to medi |          | Brown fine to medium SAND |         | Brown/black to red very fine to fine SAND with som |                | Dark brown fine to medium SAND |          | Dark brown fine to medium SAND |         | Dark brown/black TOPSOIL, organics and slag/metal |                | Dark brown/black TOPSOIL, organics and slag/metal |         |
|                              |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             | Result                       | Exceeds  | Result                                             | Exceeds | Result                                             | Exceeds  | Result                                             | Exceeds  | Result                    | Exceeds | Result                                             | Exceeds        | Result                         | Exceeds  | Result                         | Exceeds | Result                                            | Exceeds        | Result                                            | Exceeds |
| Inorganics - Metals (mg/kg)  |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |                              |          |                                                    |         |                                                    |          |                                                    |          |                           |         |                                                    |                |                                |          |                                |         |                                                   |                |                                                   |         |
| ALUMINIUM                    | 7429-90-5  | NA                                                                         | 6900 (B)                                                          | NLV                                                                                               | ID                                                               | 50,000 (D,BB)                                        | 6,900 (B)                                                          | ID                                                                   | 3.7E+5 (D,BB)                                        | NA                               | NA                                                                          | NM                           | --       | NM                                                 | --      | NM                                                 | --       | NM                                                 | --       | NM                        | --      | NM                                                 | --             | NM                             | --       | NM                             | --      | NM                                                | --             | NM                                                | --      |
| ANTIMONY                     | 7440-36-0  | 1.2 (X)                                                                    | 4.3                                                               | NLV                                                                                               | 13,000                                                           | 180                                                  | 4.3                                                                | 5,900                                                                | 670                                                  | NA                               | NA                                                                          | NM                           | --       | NM                                                 | --      | NM                                                 | --       | NM                                                 | --       | NM                        | --      | NM                                                 | --             | NM                             | --       | NM                             | --      | NM                                                | --             | NM                                                | --      |
| ARSENIC                      | 7440-38-2  | 4.6                                                                        | 4.6                                                               | NLV                                                                                               | 720                                                              | 7.6                                                  | 4.6                                                                | 910                                                                  | 37                                                   | NA                               | NA                                                                          | 7.1                          | [2,4,11] | 3.9                                                | --      | 6.6                                                | [2,4,11] | 5.6                                                | [2,4,11] | 1.4                       | --      | 73                                                 | [2,4,10,11,17] | 4.8                            | [2,4,11] | NM                             | --      | 110                                               | [2,4,10,11,17] | NM                                                | --      |
| BARIUM                       | 7440-39-3  | 130 (B,G)                                                                  | 1,300 (B)                                                         | NLV                                                                                               | 3.3E+5 (B)                                                       | 37,000 (B)                                           | 1,300 (B)                                                          | 1.5E+5 (B)                                                           | 1.3E+5 (B)                                           | NA                               | NA                                                                          | NM                           | --       | NM                                                 | --      | 35                                                 | --       | 35                                                 | --       | 8.9                       | --      | 280                                                | [2]            | 14                             | --       | NM                             | --      | 53                                                | --             | NM                                                | --      |
| BERYLLIUM                    | 7440-41-7  | 24 (G)                                                                     | 51                                                                | NLV                                                                                               | 1,300                                                            | 410                                                  | 51                                                                 | 590                                                                  | 1,600                                                | NA                               | NA                                                                          | NM                           | --       | NM                                                 | --      | NM                                                 | --       | NM                                                 | --       | NM                        | --      | NM                                                 | --             | NM                             | --       | NM                             | --      | NM                                                | --             | NM                                                | --      |
| CADMIUM                      | 7440-43-9  | 1.6 (B,G,X)                                                                | 6.0 (B)                                                           | NLV                                                                                               | 1,700 (B)                                                        | 550 (B)                                              | 6.0 (B)                                                            | 2,200 (B)                                                            | 2,100 (B)                                            | NA                               | NA                                                                          | <0.2 U                       | --       | <0.2 U                                             | --      | <0.2 U                                             | --       | <0.2 U                                             | --       | <0.2 U                    | --      | <0.2 U                                             | --             | <0.2 U                         | --       | NM                             | --      | 0.8                                               | --             | NM                                                | --      |
| CALCIUM                      | 7440-70-2  | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM                           | --       | NM                                                 | --      | NM                                                 | --       | NM                                                 | --       | NM                        | --      | NM                                                 | --             | NM                             | --       | NM                             | --      | NM                                                | --             | NM                                                | --      |
| CHROMIUM                     | 7440-47-3  | 1.2E+6 (B,G,H,X)                                                           | 1.0E+6 (B,D,H)                                                    | NLV                                                                                               | 3.30E+8 (B,H)                                                    | 7.90E+5 (B,H)                                        | 1.00E+6 (B,D,H)                                                    | 1.50E+5 (B,H)                                                        | 1.00E+6 (B,D,H)                                      | NA                               | NA                                                                          | 38                           | --       | 29                                                 | --      | 15                                                 | --       | 16                                                 | --       | 7.5                       | --      | 230                                                | --             | 33                             | --       | NM                             | --      | 13                                                | --             | NM                                                | --      |
| COBALT                       | 7440-48-4  | 2                                                                          | 0.8                                                               | NLV                                                                                               | 13,000                                                           | 2,600                                                | 2                                                                  | 5,900                                                                | 9,000                                                | NA                               | NA                                                                          | NM                           | --       | NM                                                 | --      | NM                                                 | --       | NM                                                 | --       | NM                        | --      | NM                                                 | --             | NM                             | --       | NM                             | --      | NM                                                | --             | NM                                                | --      |
| COPPER                       | 7440-50-8  | 32 (B,G)                                                                   | 5,800 (B)                                                         | NLV                                                                                               | 130,000 (B)                                                      | 20,000 (B)                                           | 5,800 (B)                                                          | 59,000 (B)                                                           | 73,000 (B)                                           | NA                               | NA                                                                          | 4,600                        | [2]      | 1,700                                              | [2]     | 990                                                | [2]      | 910                                                | [2]      | 53                        | [2]     | 6,200                                              | [2,4,11]       | 1,100                          | [2]      | NM                             | --      | 6,400                                             | [2,4,11]       | NM                                                | --      |
| IRON                         | 7439-89-6  | --                                                                         | 12,000 (B)                                                        | NLV                                                                                               | ID                                                               | 160,000 (B)                                          | 12,000 (B)                                                         | ID                                                                   | 580,000 (B)                                          | NA                               | NA                                                                          | NM                           | --       | NM                                                 | --      | NM                                                 | --       | NM                                                 | --       | NM                        | --      | NM                                                 | --             | NM                             | --       | NM                             | --      | NM                                                | --             | NM                                                | --      |
| LEAD                         | 7439-92-1  | 2,500 (B,G,X)                                                              | 700 (B)                                                           | NLV                                                                                               | 100,000 (B)                                                      | 400 (B)                                              | 700 (B)                                                            | 44,000 (B)                                                           | 900 (B,DD)                                           | NA                               | NA                                                                          | 24                           | --       | 7.7                                                | --      | 20                                                 | --       | 17                                                 | --       | 1.3                       | --      | 30                                                 | --             | 5                              | --       | NM                             | --      | 42                                                | --             | NM                                                | --      |
| LITHIUM                      | 7439-93-2  | 9.8 (B)                                                                    | 9.8 (B)                                                           | NLV                                                                                               | 2.30E+9 (B)                                                      | 4,200 (B,DD)                                         | 9.8 (B)                                                            | 1.00E+6 (B)                                                          | 31,000 (B,DD)                                        | NA                               | NA                                                                          | NM                           | --       | NM                                                 | --      | NM                                                 | --       | NM                                                 | --       | NM                        | --      | NM                                                 | --             | NM                             | --       | NM                             | --      | NM                                                | --             | NM                                                | --      |
| MAGNESIUM                    | 7439-95-4  | --                                                                         | 8,000 (B)                                                         | NLV                                                                                               | 6.70E+6 (B)                                                      | 1.0E+9 (B,D)                                         | 22,000 (B)                                                         | 2.90E+6 (B)                                                          | 1.00E+6 (B,D)                                        | NA                               | NA                                                                          | NM                           | --       | NM                                                 | --      | NM                                                 | --       | NM                                                 | --       | NM                        | --      | NM                                                 | --             | NM                             | --       | NM                             | --      | NM                                                | --             | NM                                                | --      |
| MANGANESE                    | 7439-96-5  | 440 (B,G,X)                                                                | 440 (B)                                                           | NLV                                                                                               | 3,300 (B)                                                        | 25,000 (B)                                           | 440 (B)                                                            | 1,500 (B)                                                            | 90,000 (B)                                           | NA                               | NA                                                                          | 270                          | --       | 280                                                | --      | 200                                                | --       | 210                                                | --       | 68                        | --      | 850                                                | [2,4,11]       | 460                            | [2,4,11] | NM                             | --      | 210                                               | --             | NM                                                | --      |
| MERCURY                      | 7439-97-6  | 0.13 (B,Z)                                                                 | 1.7 (B,Z)                                                         | 48 (B,Z)                                                                                          | 20,000 (B,Z)                                                     | 160 (B,Z)                                            | 1.7 (B,Z)                                                          | 8,800 (B,Z)                                                          | 580 (B,Z)                                            | 0.022 (M)                        | 0.066                                                                       | <0.05 U                      | --       | <0.05 U                                            | --      | <0.06 U                                            | --       | <0.06 U                                            | --       | <0.05 U                   | --      | <0.05 U                                            | --             | <0.05 U                        | --       | NM                             | --      | <0.07 U                                           | --             | NM                                                | --      |
| NICKEL                       | 7440-02-0  | 29 (G)                                                                     | 100 (B)                                                           | NLV                                                                                               | 13,000 (B)                                                       | 40,000 (B)                                           | 100 (B)                                                            | 16,000 (B)                                                           | 1.50E+5 (B)                                          | NA                               | NA                                                                          | NM                           | --       | NM                                                 | --      | NM                                                 | --       | NM                                                 | --       | NM                        | --      | NM                                                 | --             | NM                             | --       | NM                             | --      | NM                                                | --             | NM                                                | --      |
| POTASSIUM                    | 7440-09-7  | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM                           | --       | NM                                                 | --      | NM                                                 | --       | NM                                                 | --       | NM                        | --      | NM                                                 | --             | NM                             | --       | NM                             | --      | NM                                                | --             | NM                                                | --      |
| SELENIUM                     | 7782-49-2  | 0.41 (B)                                                                   | 4.0 (B)                                                           | NLV                                                                                               | 130,000 (B)                                                      | 2,600 (B)                                            | 4.0 (B)                                                            | 59,000 (B)                                                           | 9,600 (B)                                            | NA                               | NA                                                                          | NM                           | --       | NM                                                 | --      | <0.2 U                                             | --       | <0.2 U                                             | --       | <0.2 U                    | --      | <0.2 U                                             | --             | <0.2 U                         | --       | NM                             | --      | 0.3                                               | --             | NM                                                | --      |
| SILVER                       | 7440-22-4  | 1.0 (B,M)                                                                  | 4.5 (B)                                                           | NLV                                                                                               | 6700 (B)                                                         | 2500 (B)                                             | 13 (B)                                                             | 2,900 (B)                                                            | 9,000 (B)                                            | NA                               | NA                                                                          | 1.6                          | [2]      | 0.5                                                | --      | 0.8                                                | --       | 0.5                                                | --       | <0.1 U                    | --      | 1.3                                                | [2]            | 0.8                            | --       | NM                             | --      | 4.8                                               | [2,4]          | NM                                                | --      |
| SODIUM                       | 7440-23-5  | NA                                                                         | 4,600                                                             | NLV                                                                                               | ID                                                               | 1.0E+6 (D)                                           | NA                                                                 | ID                                                                   | 1.0E+6 (D)                                           | NA                               | NA                                                                          | NM                           | --       | NM                                                 | --      | NM                                                 | --       | NM                                                 | --       | NM                        | --      | NM                                                 | --             | NM                             | --       | NM                             | --      | NM                                                | --             | NM                                                | --      |
| VANADIUM                     | 7440-62-2  | 430                                                                        | 72                                                                | NLV                                                                                               | ID                                                               | 750 (DD)                                             | 990                                                                | ID                                                                   | 5,500 (DD)                                           | NA                               | NA                                                                          | NM                           | --       | NM                                                 | --      | NM                                                 | --       | NM                                                 | --       | NM                        | --      | NM                                                 | --             | NM                             | --       | NM                             | --      | NM                                                | --             | NM                                                | --      |
| ZINC                         | 7440-66-6  | 62 (B,G)                                                                   | 2,400 (B)                                                         | NLV                                                                                               | ID                                                               | 1.70E+5 (B)                                          | 5,000 (B)                                                          | ID                                                                   | 6.30E+5 (B)                                          | NA                               | NA                                                                          | 46                           | --       | 39                                                 | --      | 31                                                 | --       | 35                                                 | --       | 9.6                       | --      | 140                                                | [2]            | 51                             | --       | NM                             | --      | 200                                               | [2]            | NM                                                | --      |
| Inorganics - Cyanide (mg/kg) |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |                              |          |                                                    |         |                                                    |          |                                                    |          |                           |         |                                                    |                |                                |          |                                |         |                                                   |                |                                                   |         |
| CYANIDE                      | 57-12-5    | 0.1 (P,R)                                                                  | 4.0 (P,R)                                                         | NLV                                                                                               | 250 (P,R)                                                        | 12 (P,R)                                             | 4.0 (P,R)                                                          | 250 (P,R)                                                            | 250 (P,R)                                            | NA                               | NA                                                                          | NM                           | --       | NM                                                 | --      | <0.12 U                                            | --       | <0.12 U                                            | --       | <0.10 U                   | --      | <0.11 U                                            | --             | <0.11 U                        | --       | NM                             | --      | <0.14 U                                           | --             | NM                                                | --      |
| Organics - PCBs (ug/kg)      |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |                              |          |                                                    |         |                                                    |          |                                                    |          |                           |         |                                                    |                |                                |          |                                |         |                                                   |                |                                                   |         |
| AROCLOR-1260                 | 11096-82-5 | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | <540 U                       | --       | <110 U                                             | --      | NM                                                 | --       | NM                                                 | --       | NM                        | --      | NM                                                 | --             | NM                             | --       | NM                             | --      | NM                                                | --             | NM                                                | --      |
| AROCLOR-1262                 | 37324-23-5 | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | <540 U                       | --       | <110 U                                             | --      | NM                                                 | --       | NM                                                 | --       | NM                        | --      | NM                                                 | --             | NM                             | --       | NM                             | --      | NM                                                | --             | NM                                                | --      |
| TOTAL PCBs                   | 1336-36-6  | NLL                                                                        | NLL                                                               | 3.00E+6 (J,T)                                                                                     | 5.20E+6 (J,T)                                                    | 1,000 (J,T)                                          | NLL                                                                | 6.50E+6 (J,T)                                                        | 1,000 (J,T)                                          | NA                               | NA                                                                          | ND                           | --       | ND                                                 | --      | NM                                                 | --       | NM                                                 | --       | NM                        | --      | NM                                                 | --             | NM                             | --       | NM                             | --      | NM                                                | --             | NM                                                | --      |
| Organics - SVOCs (ug/kg)     |            |                                                                            |                                                                   |                                                                                                   |                                                                  |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |                              |          |                                                    |         |                                                    |          |                                                    |          |                           |         |                                                    |                |                                |          |                                |         |                                                   |                |                                                   |         |
| 1,1-BIPHENYL                 | 92-52-4    | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM                           | --       | NM                                                 | --      | NM                                                 | --       | NM                                                 | --       | NM                        | --      | NM                                                 | --             | NM                             | --       | NM                             | --      | NM                                                | --             | NM                                                | --      |
| 2-METHYLNAPHTHALENE (SVOC)   | 91-57-6S   | 4,200                                                                      | 57,000                                                            | 2.70E+06                                                                                          | 6.70E+08                                                         | 8.10E+06                                             | 1.70E+05                                                           | 2.90E+08                                                             | 2.60E+07                                             | NA                               | NA                                                                          | 1,600                        | --       | <530 U                                             | --      | <610 U                                             | --       | <610 U                                             | --       | <520 U                    | --      | <530 U                                             | --             | <530 U                         | --       | NM                             | --      | 3,000                                             | --             | NM                                                | --      |
| ACENAPHTHENE                 | 83-32-9    | 8,700                                                                      | 3.00E+05                                                          | 1.90E+08                                                                                          | 1.40E+10                                                         | 4.10E+07                                             | 8.80E+05                                                           | 6.20E+09                                                             | 1.30E+08                                             | NA                               | NA                                                                          | <220 U                       | --       | <210 U                                             | --      | <240 U                                             | --       | <240 U                                             | --       | <210 U                    | --      | <210 U                                             | --             | <210 U                         | --       | NM                             | --      | <280 U                                            | --             | NM                                                | --      |
| ACENAPHTHYLENE               | 208-96-8   | ID                                                                         | 5,900                                                             | 1.60E+06                                                                                          | 2.30E+09                                                         | 1.60E+06                                             | 17,000                                                             | 1.00E+09                                                             | 5.20E+06                                             | NA                               | NA                                                                          | <220 U                       | --       | <210 U                                             | --      | <240 U                                             | --       | <240 U                                             | --       | <210 U                    | --      | <210 U                                             | --             | <210 U                         | --       | NM                             | --      | <280 U                                            | --             | NM                                                | --      |
| ACETOPHENONE                 | 98-86-2    | ID                                                                         | 30,000                                                            | 1.20E+8 (C)                                                                                       | 3.30E+10                                                         | 4.70E+7 (C)                                          | 88,000                                                             | 1.40E+10                                                             | 1.50E+8 (C)                                          | NA                               | NA                                                                          | NM                           | --       | NM                                                 | --      | NM                                                 | --       | NM                                                 | --       | NM                        | --      | NM                                                 | --             | NM                             | --       | NM                             | --      | NM                                                | --             | NM                                                | --      |
| ANTHRACENE                   | 120-12-7   | ID                                                                         | 41,000                                                            | 1.00E+9 (D)                                                                                       | 6.70E+10                                                         | 2.30E+08                                             | 41,000                                                             | 2.90E+10                                                             | 7.30E+08                                             | NA                               | NA                                                                          | <220 U                       | --       | <210 U                                             | --      | <240 U                                             | --       | <240 U                                             | --       | <210 U                    | --      | <210 U                                             | --             | <210 U                         | --       | NM                             | --      | <280 U                                            | --             | NM                                                | --      |
| BENZALDEHYDE                 | 100-52-7   | NA                                                                         | NA                                                                | NA                                                                                                | NA                                                               | NA                                                   | NA                                                                 | NA                                                                   | NA                                                   | NA                               | NA                                                                          | NM                           | --       | NM                                                 | --      | NM                                                 | --       | NM                                                 | --       | NM                        | --      | NM                                                 | --             | NM                             | --       | NM                             | --      | NM                                                | --             | NM                                                | --      |
| BENZO(A)ANTHRACENE           | 56-55-3    | NLL                                                                        | NLL                                                               | NLV                                                                                               | ID                                                               | 20,000 (Q)                                           | NLL                                                                | ID                                                                   | 80,000 (Q)                                           | NA                               | NA                                                                          | 470                          | --       | <210 U                                             | --      | <240 U                                             | --       | <240 U                                             | --       | <210 U                    | --      | <210 U                                             | --             | <210 U                         | --       | NM                             | --      | 730                                               | --             | NM                                                | --      |
| BENZO(A)PYRENE               | 50-32-8    | NLL                                                                        | NLL                                                               | NLV                                                                                               | 1.50E+8 (Q)                                                      | 2,000 (Q)                                            | NLL                                                                | 1.90E+6 (Q)                                                          | 8,000 (Q)                                            | NA                               | NA                                                                          | <430 U                       | --       | <430 U                                             | --      | <490 U                                             | --       | <490 U                                             | --       | <420 U                    | --      | <420 U                                             | --             | <430 U                         | --       | NM                             | --      | 550 J                                             | --             | NM                                                | --      |
| BENZO(B)FLUORANTHENE         | 205-99-2   | NLL                                                                        | NLL                                                               | ID                                                                                                | 20,000 (Q)                                                       | NLL                                                  | ID                                                                 | 80,000 (Q)                                                           | NA                                                   | NA                               | NA                                                                          | 670                          | --       | <430 U                                             | --      | <490 U                                             | --       | <490 U                                             | --       | <420 U                    | --      | <420 U                                             | --             | <430 U                         | --       | NM                             | --      | 1,000                                             | --             | NM                                                | --      |
| BENZO(G,H,I)PERYLENE         | 191-24-2   | NLL                                                                        | NLL                                                               | NLV                                                                                               | 8.00E+08                                                         | 2.50E+06                                             | NLL                                                                | 3.50E+08                                                             | 7.00E+06                                             | NA                               | NA                                                                          | <430 U                       | --       | <430 U                                             | --      | <490 U                                             | --       | <490 U                                             | --       | <420 U                    | --      | <420 U                                             | --             | <430 U                         | --       | NM                             | --      | <560 U                                            | --             | NM                                                | --      |
| BENZO(K)FLUORANTHENE         | 207-08-9   | NLL                                                                        | NLL                                                               | NLV                                                                                               | ID                                                               | 2.00E+5 (Q)                                          | NLL                                                                | ID                                                                   | 8.00E+5 (Q)                                          | NA                               | NA                                                                          | <430 U                       | --       | <430 U                                             | --      | <490 U                                             | --       | <490 U                                             | --       | <420 U                    | --      | <420 U                                             | --             | <430 U                         | --       | NM                             | --      | <560 U                                            | --             | NM                                                | --      |
| BIS(2-ETHYLHEXYL)PHTHALATE   | 117-81-7   | NLL                                                                        | NLL                                                               | NLV                                                                                               | 7.00E+08                                                         |                                                      |                                                                    |                                                                      |                                                      |                                  |                                                                             |                              |          |                                                    |         |                                                    |          |                                                    |          |                           |         |                                                    |                |                                |          |                                |         |                                                   |                |                                                   |         |

**TABLE 12-2**  
**Summary of Soil Analytical Results**  
**Area M**  
**Quincy Mining Company Portage Operations Area**  
**Abandoned Mining Wastes - Torch Lake Non-Superfund Site**

| Location Code                      |            | EGLE Part 201 Generic Cleanup Criteria                         |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                  | Area M                       |           |                                                    |         |                                                    |         |                                                    |         |                           |         |                                                    |         |                                |    |                                |    |                                                   |     |                                                   |    |
|------------------------------------|------------|----------------------------------------------------------------|-------------------------------------------------------|---------------------------------------------------------------------------------|---------------------------------------------------------|---------------------------------------------|-----------------------------------------------------------|-------------------------------------------------------------|------------------------------------------------|-----------------------------------------------------------------------------|----------------------------------|------------------------------|-----------|----------------------------------------------------|---------|----------------------------------------------------|---------|----------------------------------------------------|---------|---------------------------|---------|----------------------------------------------------|---------|--------------------------------|----|--------------------------------|----|---------------------------------------------------|-----|---------------------------------------------------|----|
| Station Name                       | CAS Number | [2]<br>Groundwater Surface Water Interface Protection Criteria | [4]<br>Residential Drinking Water Protection Criteria | [5]<br>Residential Soil Volatilization to Indoor Air Inhalation Criteria (VSIC) | [9]<br>Residential Particulate Soil Inhalation Criteria | [10]<br>Residential Direct Contact Criteria | [11]<br>Nonresidential Drinking Water Protection Criteria | [16]<br>Nonresidential Particulate Soil Inhalation Criteria | [17]<br>Nonresidential Direct Contact Criteria | [18]<br>Soil Residential MSSL                                               | [19]<br>Soil Nonresidential MSSL | QMCP-SB42                    |           | QMCP-SS22                                          |         | QMCP-SS23                                          |         | QMCP-SS24                                          |         | QMCP-SS25                 |         | QMCP-SS26                                          |         |                                |    |                                |    |                                                   |     |                                                   |    |
| Field Sample ID                    |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                                                                             |                                  | QMCP-SB42 0-6in              |           | QMCP-SB42 6in-12ft                                 |         | QMCP-SS-22 0-6in                                   |         | QMCP-SS-22 0-6in DUP3                              |         | QMCP-SS-23 0-6in          |         | QMCP-SS-24 0-6in                                   |         | QMCP-SS-25 0-6in               |    | QMCP-SS-26 0-6in               |    | QMCP-SS-26 0-6in                                  |     |                                                   |    |
| Sample Date                        |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                                                                             |                                  | 9/10/2018                    |           | 9/10/2018                                          |         | 9/6/2018                                           |         | 9/6/2018                                           |         | 9/6/2018                  |         | 9/6/2018                                           |         | 9/6/2018                       |    | 9/6/2018                       |    | 9/6/2018                                          |     |                                                   |    |
| Sample Interval (bgs)              |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                                                                             |                                  | 0 - 0.5 ft                   |           | 0.5 - 12 ft                                        |         | 0 - 0.5 ft                                         |         | 0 - 0.5 ft                                         |         | 0 - 0.5 ft                |         | 0 - 0.5 ft                                         |         | 0 - 0.5 ft                     |    | 0 - 0.5 ft                     |    | 0 - 0.5 ft                                        |     |                                                   |    |
| Sample Description                 |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                                                                             |                                  | SAND, Medium to coarse, gray |           | SAND, Medium to coarse, brown, saturated at 12 fee |         | Dark brown TOPSOIL to 5in, then brown fine to medi |         | Dark brown TOPSOIL to 5in, then brown fine to medi |         | Brown fine to medium SAND |         | Brown/black to red very fine to fine SAND with som |         | Dark brown fine to medium SAND |    | Dark brown fine to medium SAND |    | Dark brown/black TOPSOIL, organics and slag/metal |     | Dark brown/black TOPSOIL, organics and slag/metal |    |
|                                    |            | Result                                                         | Exceeds                                               | Result                                                                          | Exceeds                                                 | Result                                      | Exceeds                                                   | Result                                                      | Exceeds                                        | Result                                                                      | Exceeds                          | Result                       | Exceeds   | Result                                             | Exceeds | Result                                             | Exceeds | Result                                             | Exceeds | Result                    | Exceeds | Result                                             | Exceeds |                                |    |                                |    |                                                   |     |                                                   |    |
| Organics - SVOCs (ug/kg) Continued |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                                                                             |                                  |                              |           |                                                    |         |                                                    |         |                                                    |         |                           |         |                                                    |         |                                |    |                                |    |                                                   |     |                                                   |    |
| DIBENZO(A,H)ANTHRACENE             | 53-70-3    | NLL                                                            | NLL                                                   | NLV                                                                             | ID                                                      | 2,000 (Q)                                   | NLL                                                       | ID                                                          | 8,000 (Q)                                      | NA                                                                          | NA                               | <430 U                       | --        | <430 U                                             | --      | <490 U                                             | --      | <490 U                                             | --      | <420 U                    | --      | <420 U                                             | --      | <430 U                         | -- | NM                             | -- | <560 U                                            | --  | NM                                                | -- |
| DIBENZOFURAN                       | 132-64-9   | 1,700                                                          | ID                                                    | 2.00E+06                                                                        | 6.70E+06                                                | ID                                          | ID                                                        | 2.90E+06                                                    | ID                                             | NA                                                                          | NA                               | <540 U                       | --        | <530 U                                             | --      | NM                                                 | --      | NM                                                 | --      | NM                        | --      | NM                                                 | --      | NM                             | -- | NM                             | -- | NM                                                | --  | NM                                                | -- |
| FLUORANTHENE                       | 206-44-0   | 5,500                                                          | 730,000                                               | 1.00E+9 (D)                                                                     | 9.30E+09                                                | 4.60E+07                                    | 730,000                                                   | 4.10E+09                                                    | 1.30E+08                                       | NA                                                                          | NA                               | 1,200                        | --        | <210 U                                             | --      | <240 U                                             | --      | <240 U                                             | --      | <210 U                    | --      | <210 U                                             | --      | <210 U                         | -- | NM                             | -- | 1,400                                             | --  | NM                                                | -- |
| FLUORENE                           | 86-73-7    | 5,300                                                          | 390,000                                               | 5.80E+08                                                                        | 9.30E+09                                                | 2.70E+07                                    | 890,000                                                   | 4.10E+09                                                    | 8.70E+07                                       | NA                                                                          | NA                               | <220 U                       | --        | <210 U                                             | --      | <240 U                                             | --      | <240 U                                             | --      | <210 U                    | --      | <210 U                                             | --      | <210 U                         | -- | NM                             | -- | <280 U                                            | --  | NM                                                | -- |
| INDENO(1,2,3-CD)PYRENE             | 193-39-5   | NLL                                                            | NLL                                                   | NLV                                                                             | ID                                                      | 20,000 (Q)                                  | NLL                                                       | ID                                                          | 80,000 (Q)                                     | NA                                                                          | NA                               | <430 U                       | --        | <430 U                                             | --      | <490 U                                             | --      | <490 U                                             | --      | <420 U                    | --      | <420 U                                             | --      | <430 U                         | -- | NM                             | -- | <560 U                                            | --  | NM                                                | -- |
| NAPHTHALENE (SVOC)                 | 91-20-3S   | 730                                                            | 35,000                                                | 2.50E+05                                                                        | 2.00E+08                                                | 1.60E+07                                    | 1.00E+05                                                  | 8.80E+07                                                    | 5.20E+07                                       | NA                                                                          | NA                               | 1,000                        | [2]       | <210 U                                             | --      | <240 U                                             | --      | <240 U                                             | --      | <210 U                    | --      | <210 U                                             | --      | <210 U                         | -- | NM                             | -- | 2,200                                             | [2] | NM                                                | -- |
| PHENANTHRENE                       | 85-01-8    | 2,100                                                          | 56,000                                                | 2.80E+06                                                                        | 6.70E+06                                                | 1.60E+06                                    | 1.60E+05                                                  | 2.90E+06                                                    | 5.20E+06                                       | NA                                                                          | NA                               | 1,400                        | --        | <210 U                                             | --      | <240 U                                             | --      | <240 U                                             | --      | <210 U                    | --      | <210 U                                             | --      | <210 U                         | -- | NM                             | -- | 2,100                                             | --  | NM                                                | -- |
| PYRENE                             | 129-00-0   | ID                                                             | 4.80E+05                                              | 1.00E+9 (D)                                                                     | 6.70E+09                                                | 2.90E+07                                    | 4.80E+05                                                  | 2.90E+09                                                    | 8.40E+07                                       | NA                                                                          | NA                               | 870                          | --        | <210 U                                             | --      | <240 U                                             | --      | <240 U                                             | --      | <210 U                    | --      | <210 U                                             | --      | <210 U                         | -- | NM                             | -- | 1,100                                             | --  | NM                                                | -- |
| Organics - VOCs (ug/kg)            |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                                                                             |                                  |                              |           |                                                    |         |                                                    |         |                                                    |         |                           |         |                                                    |         |                                |    |                                |    |                                                   |     |                                                   |    |
| 1,2,3-TRIMETHYLBENZENE             | 526-73-8   | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | 270 (JT)                                                                    | 800 (JT)                         | 140                          | --        | <59 U                                              | --      | NM                                                 | --      | NM                                                 | --      | NM                        | --      | NM                                                 | --      | NM                             | -- | NM                             | -- | NM                                                | --  | NM                                                | -- |
| 1,2,4-TRIMETHYLBENZENE             | 95-63-6    | 570 (I)                                                        | 2,100 (I)                                             | 4.3E+6 (C,I)                                                                    | 8.20E+10 (I)                                            | 3.2E+07 (C,I)                               | 2,100 (I)                                                 | 3.60E+10 (I)                                                | 1.00E+8 (C,I)                                  | 150 (JT)                                                                    | 430 (JT)                         | 380                          | [18]      | <59 U                                              | --      | NM                                                 | --      | NM                                                 | --      | NM                        | --      | NM                                                 | --      | NM                             | -- | NM                             | -- | NM                                                | --  | NM                                                | -- |
| 1,3,5-TRIMETHYLBENZENE             | 108-67-8   | 1,100 (I)                                                      | 1,800 (I)                                             | 2.6E+6 (C,I)                                                                    | 8.20E+10 (I)                                            | 3.2E+07 (C)                                 | 2,100 (I)                                                 | 3.60E+10 (I)                                                | 1.00E+8 (C,I)                                  | 100 (JT)                                                                    | 300 (JT)                         | 89                           | --        | <59 U                                              | --      | NM                                                 | --      | NM                                                 | --      | NM                        | --      | NM                                                 | --      | NM                             | -- | NM                             | -- | NM                                                | --  | NM                                                | -- |
| 2,2,4-TRIMETHYLPENTANE             | 540-84-1   | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                                                                          | NA                               | <280 U                       | --        | <290 U                                             | --      | NM                                                 | --      | NM                                                 | --      | NM                        | --      | NM                                                 | --      | NM                             | -- | NM                             | -- | NM                                                | --  | NM                                                | -- |
| 2-METHYLNAPHTHALENE (VOC)          | 91-57-6V   | 4,200                                                          | 57,000                                                | 2.70E+06                                                                        | 6.70E+08                                                | 8.10E+06                                    | 1.70E+05                                                  | 2.90E+08                                                    | 2.60E+07                                       | NA                                                                          | NA                               | 820                          | --        | <290 U                                             | --      | NM                                                 | --      | NM                                                 | --      | NM                        | --      | NM                                                 | --      | NM                             | -- | NM                             | -- | NM                                                | --  | NM                                                | -- |
| BENZENE                            | 71-43-2    | 240 (I,X)                                                      | 100 (I)                                               | 1,600 (I)                                                                       | 3.80E+8 (I)                                             | 1.8E+5 (I)                                  | 100 (I)                                                   | 4.70E+8 (I)                                                 | 8.40E+5 (C,I)                                  | 1.7 (M)                                                                     | 7.9 (M)                          | 82                           | [18,19]   | <59 U                                              | --      | NM                                                 | --      | NM                                                 | --      | NM                        | --      | NM                                                 | --      | NM                             | -- | NM                             | -- | NM                                                | --  | NM                                                | -- |
| CYCLOHEXANE                        | 110-82-7   | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                                                                          | NA                               | 540                          | --        | <290 U                                             | --      | NM                                                 | --      | NM                                                 | --      | NM                        | --      | NM                                                 | --      | NM                             | -- | NM                             | -- | NM                                                | --  | NM                                                | -- |
| ETHYLBENZENE                       | 100-41-4   | 360                                                            | 1,500                                                 | 87,000                                                                          | 1.00E+10                                                | 2.20E+07                                    | 1,500                                                     | 1.30E+10                                                    | 7.10E+07                                       | 12 (M)                                                                      | 57                               | 95                           | [18,19]   | <59 U                                              | --      | NM                                                 | --      | NM                                                 | --      | NM                        | --      | NM                                                 | --      | NM                             | -- | NM                             | -- | NM                                                | --  | NM                                                | -- |
| HEXANE                             | 110-54-3   | NA                                                             | 1.8E+5 (C)                                            | 5.1E+5 (C)                                                                      | 1.30E+10                                                | 9.2E+7 (C)                                  | 5.10E+5 (C)                                               | 5.90E+09                                                    | 3.00E+8 (C)                                    | 25                                                                          | 74                               | 150                          | [18,19]   | <59 U                                              | --      | NM                                                 | --      | NM                                                 | --      | NM                        | --      | NM                                                 | --      | NM                             | -- | NM                             | -- | NM                                                | --  | NM                                                | -- |
| ISOPROPYLBENZENE                   | 98-82-8    | 3,200                                                          | 91,000                                                | 4.00E+5 (C)                                                                     | 5.80E+09                                                | 2.50E+7 (C)                                 | 2.60E+05                                                  | 2.60E+09                                                    | 8.00E+7 (C)                                    | NA                                                                          | NA                               | 59                           | --        | <59 U                                              | --      | NM                                                 | --      | NM                                                 | --      | NM                        | --      | NM                                                 | --      | NM                             | -- | NM                             | -- | NM                                                | --  | NM                                                | -- |
| M,P-XYLENE                         | 1330-20-7  | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                                                                          | NA                               | 690                          | --        | <120 U                                             | --      | NM                                                 | --      | NM                                                 | --      | NM                        | --      | NM                                                 | --      | NM                             | -- | NM                             | -- | NM                                                | --  | NM                                                | -- |
| NAPHTHALENE (VOC)                  | 91-20-3V   | 730                                                            | 35,000                                                | 2.50E+05                                                                        | 2.00E+08                                                | 1.60E+07                                    | 1.00E+05                                                  | 8.80E+07                                                    | 5.20E+07                                       | NA                                                                          | NA                               | 740                          | [2]       | <290 U                                             | --      | NM                                                 | --      | NM                                                 | --      | NM                        | --      | NM                                                 | --      | NM                             | -- | NM                             | -- | NM                                                | --  | NM                                                | -- |
| N-PROPYLBENZENE                    | 103-65-1   | ID                                                             | 1,600 (I)                                             | ID                                                                              | 1.30E+9 (I)                                             | 2.50E+6 (I)                                 | 4,600                                                     | 5.90E+08                                                    | 8.00E+06                                       | 1,800                                                                       | 3,500                            | 70                           | --        | <59 U                                              | --      | NM                                                 | --      | NM                                                 | --      | NM                        | --      | NM                                                 | --      | NM                             | -- | NM                             | -- | NM                                                | --  | NM                                                | -- |
| O-XYLENE                           | 95-47-6    | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                                                                          | NA                               | 500                          | --        | <59 U                                              | --      | NM                                                 | --      | NM                                                 | --      | NM                        | --      | NM                                                 | --      | NM                             | -- | NM                             | -- | NM                                                | --  | NM                                                | -- |
| P-ISOPROPYL TOLUENE (p-CYMENE)     | 99-87-6    | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                                                                          | NA                               | NM                           | --        | NM                                                 | --      | NM                                                 | --      | NM                                                 | --      | NM                        | --      | NM                                                 | --      | NM                             | -- | NM                             | -- | NM                                                | --  | NM                                                | -- |
| SEC-BUTYLBENZENE                   | 135-98-8   | ID                                                             | 1,600                                                 | ID                                                                              | 4.00E+08                                                | 2.50E+06                                    | 4,600                                                     | 1.80E+08                                                    | 8.00E+06                                       | NA                                                                          | NA                               | <57 U                        | --        | <59 U                                              | --      | NM                                                 | --      | NM                                                 | --      | NM                        | --      | NM                                                 | --      | NM                             | -- | NM                             | -- | NM                                                | --  | NM                                                | -- |
| STYRENE                            | 100-42-5   | 530 (X)                                                        | 2,700                                                 | 2.50E+05                                                                        | 5.50E+09                                                | 4.00E+05                                    | 2,700                                                     | 6.90E+09                                                    | 1.90E+6 (C)                                    | NA                                                                          | NA                               | <57 U                        | --        | <59 U                                              | --      | NM                                                 | --      | NM                                                 | --      | NM                        | --      | NM                                                 | --      | NM                             | -- | NM                             | -- | NM                                                | --  | NM                                                | -- |
| TETRACHLOROETHYLENE                | 127-18-4   | 220 (X)                                                        | 100                                                   | 11,000                                                                          | 2.70E+09                                                | 2.0E+5 (C)                                  | 100                                                       | 1.20E+09                                                    | 9.30E+5 (C)                                    | 6.2 (M)                                                                     | 12 (M)                           | <57 U                        | --        | <59 U                                              | --      | NM                                                 | --      | NM                                                 | --      | NM                        | --      | NM                                                 | --      | NM                             | -- | NM                             | -- | NM                                                | --  | NM                                                | -- |
| TOLUENE                            | 108-88-3   | 5,400 (I)                                                      | 16,000 (I)                                            | 3.30E+5 (C,I)                                                                   | 2.70E+10 (I)                                            | 5E+07 (C,I)                                 | 16,000 (I)                                                | 1.20E+10 (I)                                                | 1.60E+8 (C,I)                                  | 3,700                                                                       | 11,000                           | 460                          | --        | 92                                                 | --      | NM                                                 | --      | NM                                                 | --      | NM                        | --      | NM                                                 | --      | NM                             | -- | NM                             | -- | NM                                                | --  | NM                                                | -- |
| XYLENE - TOTAL                     | 1330-20-7  | 980 (I)                                                        | 5,600 (I)                                             | 6.30E+6 (I)                                                                     | 2.90E+11 (I)                                            | 4.1E+08 (C,I)                               | 5,600 (I)                                                 | 1.30E+11 (I)                                                | 1.00E+9 (C,D,J)                                | 280 (J)                                                                     | 830 (J)                          | 1,190                        | [2,18,19] | ND                                                 | --      | NM                                                 | --      | NM                                                 | --      | NM                        | --      | NM                                                 | --      | NM                             | -- | NM                             | -- | NM                                                | --  | NM                                                | -- |
| Organics - Pesticides (ug/kg)      |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                                                                             |                                  |                              |           |                                                    |         |                                                    |         |                                                    |         |                           |         |                                                    |         |                                |    |                                |    |                                                   |     |                                                   |    |
| 4,4-DDE                            | 72-55-9    | NLL                                                            | NLL                                                   | NLV                                                                             | 3.20E+07                                                | 45,000                                      | NLL                                                       | 4.00E+07                                                    | 1.90E+05                                       | NA                                                                          | NA                               | NM                           | --        | NM                                                 | --      | NM                                                 | --      | NM                                                 | --      | NM                        | --      | NM                                                 | --      | NM                             | -- | NM                             | -- | NM                                                | --  | NM                                                | -- |
| 4,4-DDT                            | 50-29-3    | NLL                                                            | NLL                                                   | NLV                                                                             | 3.20E+07                                                | 57,000                                      | NLL                                                       | 4.00E+07                                                    | 2.80E+05                                       | NA                                                                          | NA                               | NM                           | --        | NM                                                 | --      | NM                                                 | --      | NM                                                 | --      | NM                        | --      | NM                                                 | --      | NM                             | -- | NM                             | -- | NM                                                | --  | NM                                                | -- |
| ALDRIN                             | 309-00-2   | NLL                                                            | NLL                                                   | 1.30E+06                                                                        | 6.40E+05                                                | 1,000                                       | NLL                                                       | 8.00E+05                                                    | 4,300                                          | NA                                                                          | NA                               | NM                           | --        | NM                                                 | --      | NM                                                 | --      | NM                                                 | --      | NM                        | --      | NM                                                 | --      | NM                             | -- | NM                             | -- | NM                                                | --  | NM                                                | -- |
| ALPHA-CHLORDANE                    | 5103-71-9  | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                                                                          | NA                               | NM                           | --        | NM                                                 | --      | NM                                                 | --      | NM                                                 | --      | NM                        | --      | NM                                                 | --      | NM                             | -- | NM                             | -- | NM                                                | --  | NM                                                | -- |
| BETA-BHC                           | 319-85-7   | ID                                                             | 37                                                    | NLV                                                                             | 5.90E+06                                                | 5,400                                       | 150                                                       | 7.40E+06                                                    | 25,000                                         | NA                                                                          | NA                               | NM                           | --        | NM                                                 | --      | NM                                                 | --      | NM                                                 | --      | NM                        | --      | NM                                                 | --      | NM                             | -- | NM                             | -- | NM                                                | --  | NM                                                | -- |
| ENDOSULFAN I                       | 959-98-8   | NLL                                                            | NLL                                                   | ID                                                                              | ID                                                      | 1.4E+06 (J)                                 | NLL                                                       | ID                                                          | 4.40E+06 (J)                                   | NA                                                                          | NA                               | NM                           | --        | NM                                                 | --      | NM                                                 | --      | NM                                                 | --      | NM                        | --      | NM                                                 | --      | NM                             | -- | NM                             | -- | NM                                                | --  | NM                                                | -- |
| ENDRIN KETONE                      | 53494-70-5 | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                                                                          | NA                               | NM                           | --        | NM                                                 | --      | NM                                                 | --      | NM                                                 | --      | NM                        | --      | NM                                                 | --      | NM                             | -- | NM                             | -- | NM                                                | --  | NM                                                | -- |
| GAMMA-CHLORDANE                    | 5103-74-2  | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                                                                          | NA                               | NM                           | --        | NM                                                 | --      | NM                                                 | --      | NM                                                 | --      | NM                        | --      | NM                                                 | --      | NM                             | -- | NM                             | -- | NM                                                | --  | NM                                                | -- |
| HEPTACHLOR                         | 76-44-8    | NLL                                                            | NLL                                                   | 3.50E+05                                                                        | 2.40E+06                                                | 5,600                                       | NLL                                                       | 3.00E+06                                                    | 23,000                                         | NA                                                                          | NA                               | NM                           | --        | NM                                                 | --      | NM                                                 | --      | NM                                                 | --      | NM                        | --      | NM                                                 | --      | NM                             | -- | NM                             | -- | NM                                                | --  | NM                                                | -- |
| Other                              |            |                                                                |                                                       |                                                                                 |                                                         |                                             |                                                           |                                                             |                                                |                                                                             |                                  |                              |           |                                                    |         |                                                    |         |                                                    |         |                           |         |                                                    |         |                                |    |                                |    |                                                   |     |                                                   |    |
| CHLORIDE (mg/kg)                   | --         | 94 (X)                                                         | 5,000                                                 | NLV                                                                             | ID                                                      | 500 (F)                                     | 5,000                                                     | ID                                                          | 500 (F)                                        | NA                                                                          | NA                               | NM                           | --        | NM                                                 | --      | NM                                                 | --      | NM                                                 | --      | NM                        | --      | NM                                                 | --      | NM                             | -- | NM                             | -- | NM                                                | --  | NM                                                | -- |
| PERCENT MOISTURE (%)               | --         | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                                                                          | NA                               | NM                           | --        | NM                                                 | --      | NM                                                 | --      | NM                                                 | --      | NM                        | --      | NM                                                 | --      | NM                             | -- | NM                             | -- | NM                                                | --  | NM                                                | -- |
| HYDROCARBONS, TOTAL (mg/kg)        | --         | NA                                                             | NA                                                    | NA                                                                              | NA                                                      | NA                                          | NA                                                        | NA                                                          | NA                                             | NA                                                                          | NA                               | NM                           | --        | NM                                                 | --      | NM                                                 | --      | NM                                                 | --      | NM                        | --      | NM                                                 | --      | NM                             | -- | NM                             | -- | NM                                                | --  | NM                                                | -- |

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 12-2  
Summary of Soil Analytical Results  
Area M  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Soil Table Footnotes:

- EGLE Part 201 residential and non-residential generic cleanup criteria and screening levels criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Release Date: December 30, 2013. Updated June 2018.

- Only detected analytes are listed - Gray rows indicate requested analyses. If no analytes are listed below a gray row then all analytes of that group were either not analyzed or not detected.

- **Bold** values are concentrations detected above the laboratory reporting limit.

- **Bold/Shaded** cells indicate analyte concentration exceeded applicable criteria. EGLE Part 201 criteria exceeded is indicated by the footnote in [brackets] following the result value and defined below:

- |                                                                                |                                                                                    |
|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| [2] - Groundwater Surface Water Interface Protection Criteria                  | [11] - Nonresidential Drinking Water Protection Criteria                           |
| [3] - Soil Saturation Concentration Screening Levels                           | [12] - Nonresidential Soil Volatilization to Indoor Air Inhalation Criteria (VIAC) |
| [4] - Residential Drinking Water Protection Criteria                           | [13] - Nonresidential Infinite Source Volatile Soil Inhalation Criteria (VSIC)     |
| [5] - Residential Soil Volatilization to Indoor Air Inhalation Criteria (VIAC) | [14] - Nonresidential Finite VSIC for 5 Meter Source Thickness                     |
| [6] - Residential Infinite Source Volatile Soil Inhalation Criteria (VSIC)     | [15] - Nonresidential Finite VSIC for 2 Meter Source Thickness                     |
| [7] - Residential Finite VSIC for 5 Meter Source Thickness                     | [16] - Nonresidential Particulate Soil Inhalation Criteria                         |
| [8] - Residential Finite VSIC for 2 Meter Source Thickness                     | [17] - Nonresidential Direct Contact Criteria                                      |
| [9] - Residential Particulate Soil Inhalation Criteria                         | [18] - Soil Residential MSSL                                                       |
| [10] - Residential Direct Contact Criteria                                     | [19] - Soil Nonresidential MSSL                                                    |

Evaluation based on EGLE Criteria at time of Project completion.

Samples described in this evaluation may actually refer to stamp sands or to other mining waste from the historic mining and reclamation processes conducted in the area.

-- = No Exceedances

NM = Not Measured

ND = Not Detected

bgs = Below ground surface

ft = Feet

in = Inches

mg/kg = Milligrams per kilogram.

PCBs = Polychlorinated biphenyls

VOC = Volatile organic compound

SVOC = Semi-volatile organic compound

MSSL = Media-Specific Volatilization to Indoor Air Interim Action Screening Level

ug/kg = Micrograms per kilogram

% = Percentage

Criteria Footnotes:

ID = Insufficient data to develop criterion.

NA = A criterion or value is not available

NLL = Hazardous substance is not likely to leach under most soil conditions.

(B) = Background, as defined in R 299.1(b), may be substituted if higher than the calculated cleanup criterion. Background levels may be less than criteria for some inorganic compounds.

(BB) = The state drinking water standard for asbestos (fibers greater than 10 micrometers in length) is in units of a million fibers per liter of water (MFL). Soil concentrations of asbestos are determined by polarized light microscop.

(C) = The criterion developed under R 299.20 to R 299.26 exceeds the chemical- specific soil saturation screening level (Csat). The person proposing or implementing response activity shall document whether additional response activity is required to control free-phase liquids or NAPL to protect against risks associated with free-phase liquids by using methods appropriate for the free-phase liquids present. Development of a site-specific Csat or methods presented in R 299.22, R 299.24(5), and R 299.26(8) may be conducted for the relevant exposure pathways.

(D) = Calculated criterion exceeds 100 percent, hence it is reduced to 100 percent or 1.0E+9 parts per billion (ppb).

(DD) = Hazardous substance causes developmental effects. Residential direct contact criteria are protective of both prenatal and postnatal exposure. Nonresidential direct contact criteria are protective for a pregnant adult receptor.

(F) = Criterion is based on adverse impacts to plant life and phytotoxicity.

(G) = Groundwater surface water interface (GSI) criterion depends on the pH or water hardness, or both, of the receiving surface water. The final chronic value (FCV) for the protection of aquatic life shall be calculated based on the pH or hardness of the receiving surface water. Where water hardness exceeds 400 mg Ca<sub>4</sub>/L, use 400 mg CaCO<sub>3</sub>/L for the FCV calculation. The FCV formula provides values in units of ug/L or ppb.

The generic GSI criterion is the lesser of the calculated FCV, the wildlife value (WV), and the surface water human non-drinking water value (HNDV). The soil GSI protection criteria for these hazardous substances are the greater of the 20 times the GSI criterion or the GSI soil-water partition values using the GSI criteria developed with the procedure described in this footnote. A spreadsheet that may be used to calculate GSI and GSI protection criteria for (G)-footnoted hazardous substances is available on the Department of Environment, Great Lakes, and Energy (EGLE) internet web site. A hardness value of 47.5 CaCO<sub>3</sub>L and pH of 7, derived from the Michigan Department of Environmental Quality Draft Site Inspection Report for Lake Linden Operations dated 3/29/13, was used in the footnote G calculation spreadsheet.

(H) = Valence-specific chromium data (Cr III and Cr VI) shall be compared to the corresponding valence-specific cleanup criteria. If both Cr III and Cr VI are present in groundwater, the total concentration of both cannot exceed the drinking water criterion of 100 ug/L. If analytical data are provided for total chromium only, they shall be compared to the cleanup criteria for Cr VI. Cr III soil cleanup criterion for protection of drinking water can only be used at sites where groundwater is prevented from being used as a public water supply, currently and in the future, through an approved land or resource use restriction.

(I) = Hazardous substance may exhibit the characteristic of ignitability as defined in 40 C.F.R. §261.21 (revised as of July 1, 2001), which is adopted by reference in these rules and is available for inspection at the EGLE, 525 West Allegan Street, Lansing, Michigan. Copies of the regulation may be purchased, at a cost as of the time of adoption of these rules of \$45, from the Superintendent of documents, Government Printing Office, Washington, DC 20401 (stock number 869-044-00155-1), or from the EGLE, Remediation and Redevelopment Division (RRD), 525 West Allegan Street, Lansing, Michigan 48933, at cost.

(J) = Hazardous substance may be present in several isomer forms. Isomer-specific concentrations shall be added together for comparison to criteria.

(M) = Calculated criterion is below the analytical target detection limit, therefore, the criterion defaults to the target detection limit.

(P) = Amenable cyanide methods or method OIA-1677 shall be used to quantify cyanide concentrations for compliance with all groundwater criteria. Total cyanide methods or method OIA-1677 shall be used to quantify cyanide concentrations for compliance with soil criteria. Nonresidential direct contact criteria may not be protective of the potential for release of hydrogen cyanide gas. Additional land or resource use restrictions may be necessary to protect for the acute inhalation concerns associated with hydrogen cyanide gas.

(Q) = Criteria for carcinogenic polycyclic aromatic hydrocarbons were developed using relative potential potencies to benzo(a)pyrene.

(R) = Hazardous substance may exhibit the characteristic of reactivity as defined in 40 C.F.R. §261.23 (revised as of July 1, 2001), which is adopted by reference in these rules and is available for inspection at the EGLE, 525 West Allegan Street, Lansing, Michigan. Copies of the regulation may be purchased, at a cost as of the time of adoption of these rules of \$45, from the Superintendent of Documents, Government Printing Office, Washington, DC 20401 (stock number 869-044-00155-1), or from the EGLE, RRD, 525 West Allegan Street, Lansing, Michigan 48933, at cost.

(T) = Refer to the federal Toxic Substances Control Act (TSCA), 40 C.F.R. §761, Subpart D and 40 C.F.R. §761, Subpart G, to determine the applicability of TSCA cleanup standards. Subpart D and Subpart G of 40 C.F.R. §761 (July 1, 2001) are adopted by reference in these rules and are available for inspection at the EGLE, 525 West Allegan Street, Lansing, Michigan. Copies of the regulations may be purchased, at a cost as of the time of adoption of these rules of \$55, from the Superintendent of Documents, Government Printing Office, Washington, DC 20401, or from the EGLE, RRD, 525 West Allegan Street, Lansing, Michigan 48933, at cost. Alternatives to compliance with the TSCA standards listed below are possible under 40 C.F.R. §761 Subpart D. New releases may be subject to the standards identified in 40 C.F.R. §761, Subpart G. Use Part 201 soil direct contact cleanup criteria in the published table if TSCA standards are not applicable.

(X) = The GSI criterion shown in the generic cleanup criteria tables is not protective for surface water that is used as a drinking water source. (See R 299.49 Footnotes for generic cleanup criteria tables for additional information.)

(Z) = Mercury is typically measured as total mercury. The generic cleanup criteria, however, are based on data for different species of mercury. Specifically, data for elemental mercury, chemical abstract service (CAS) number 7439976, serve as the basis for the soil volatilization to indoor air criteria, groundwater volatilization to indoor air, and soil inhalation criteria. Data for methyl mercury, CAS number 22967926, serve as the basis for the GSI criterion; and data for mercuric chloride, CAS number 7487947, serve as the basis for the drinking water, groundwater contact, soil direct contact, and the groundwater protection criteria. Comparison to criteria shall be based on species-specific analytical data only if sufficient facility characterization has been conducted to rule out the presence of other species of mercury.

MSSL Footnotes:

J = Hazardous substance may be present in several isomer forms. Isomer-specific concentrations must be added together for comparison to screening level.

JT = Hazardous substance may be present in several isomer forms. Screening levels may be used for the individual isomer provided that it is the sole isomer detected; however, when multiple isomers are detected in a medium, the isomer-specific concentrations must be added together and compared to the most restrictive screening level of the detected isomers.

M = The screening level may be below target detection limits (TDL).

Laboratory Footnotes:

J = The result is an estimated quantity.

U = Analyte analyzed for but not detected above the reported sample reporting limit.

UU = Analyte analyzed for but not detected above the reported sample reporting limit and is an estimated quantity.

**TABLE 12-2**  
**Summary of Soil Analytical Results**  
**Area M**  
**Quincy Mining Company Portage Operations Area**  
**Abandoned Mining Wastes - Torch Lake Non-Superfund Site**

|                                                                                                         | Part 201 Generic Cleanup Criteria Evaluated                                        | Exceedance |
|---------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------|
| <b>EGLE Part 201 Generic Cleanup Criteria<br/>(June 2018)</b>                                           | [2] - Groundwater Surface Water Interface Protection Criteria                      | YES        |
|                                                                                                         | [3] - Soil Saturation Concentration Screening Levels                               | NO         |
|                                                                                                         | [4] - Residential Drinking Water Protection Criteria                               | YES        |
|                                                                                                         | [5] - Residential Soil Volatilization to Indoor Air Inhalation Criteria (VIAC)     | NO         |
|                                                                                                         | [6] - Residential Infinite Source Volatile Soil Inhalation Criteria (VSIC)         | NO         |
|                                                                                                         | [7] - Residential Finite VSIC for 5 Meter Source Thickness                         | NO         |
|                                                                                                         | [8] - Residential Finite VSIC for 2 Meter Source Thickness                         | NO         |
|                                                                                                         | [9] - Residential Particulate Soil Inhalation Criteria                             | NO         |
|                                                                                                         | [10] - Residential Direct Contact Criteria                                         | YES        |
|                                                                                                         | [11] - Nonresidential Drinking Water Protection Criteria                           | YES        |
|                                                                                                         | [12] - Nonresidential Soil Volatilization to Indoor Air Inhalation Criteria (VIAC) | NO         |
|                                                                                                         | [13] - Nonresidential Infinite Source Volatile Soil Inhalation Criteria (VSIC)     | NO         |
|                                                                                                         | [14] - Nonresidential Finite VSIC for 5 Meter Source Thickness                     | NO         |
|                                                                                                         | [15] - Nonresidential Finite VSIC for 2 Meter Source Thickness                     | NO         |
|                                                                                                         | [16] - Nonresidential Particulate Soil Inhalation Criteria                         | NO         |
|                                                                                                         | [17] - Nonresidential Direct Contact Criteria                                      | YES        |
| <b>Media-Specific Volatilization to Indoor Air Interim<br/>Action Screening Levels<br/>(March 2021)</b> | [18] - Soil Residential Media-Specific Screening Level (MSSL)                      | YES        |
|                                                                                                         | [19] - Soil Nonresidential MSSL                                                    | YES        |



TABLE 12-3  
Summary of Groundwater Analytical Results  
Area M  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code                      |            | EGLE Part 201 Generic Cleanup Criteria           |                                                     |                                                              |                                                                                                |                                                                                                   |                         | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                                         |                                            |                                               |                                               |                                                             | Area M     |         |            |         |            |         |           |         |          |         |          |         |           |         |           |         |
|------------------------------------|------------|--------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------|-----------------------------------------------|-----------------------------------------------|-------------------------------------------------------------|------------|---------|------------|---------|------------|---------|-----------|---------|----------|---------|----------|---------|-----------|---------|-----------|---------|
| Station Name                       | CAS Number | [1]<br>Residential<br>Drinking Water<br>Criteria | [2]<br>Nonresidential<br>Drinking Water<br>Criteria | [3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [4]<br>Residential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [5]<br>Nonresidential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [6]<br>Water Solubility | [8]<br>Shallow<br>Groundwater<br>Residential<br>MSSL                        | [9]<br>Shallow<br>Groundwater<br>Nonresidential<br>MSSL | [10]<br>Groundwater<br>Residential<br>MSSL | [11]<br>Groundwater<br>Residential TS<br>MSSL | [12]<br>Groundwater<br>Nonresidential<br>MSSL | [13]<br>Groundwater<br>Nonresidential<br>MSSL <sub>12</sub> | OW #1      |         | OW #2      |         | OW #3      |         | PW #2     |         |          |         |          |         |           |         |           |         |
| Field Sample ID                    |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | OW1        |         | OW2        |         | OW3        |         | #2        |         | #2       |         | #2       |         | #2        |         | #2        |         |
| Sample Date                        |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 12/14/1994 |         | 12/14/1994 |         | 12/14/1994 |         | 8/28/1994 |         | 1/5/1995 |         | 6/7/1995 |         | 9/11/1995 |         | 1/16/1996 |         |
| Sample Interval (bgs)              |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | --         |         | --         |         | --         |         | --        |         | --       |         | --       |         | --        |         | --        |         |
|                                    |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | Result     | Exceeds | Result     | Exceeds | Result     | Exceeds | Result    | Exceeds | Result   | Exceeds | Result   | Exceeds | Result    | Exceeds | Result    | Exceeds |
| Inorganics - Metals (ug/l)         |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |            |         |            |         |            |         |           |         |          |         |          |         |           |         |           |         |
| ARSENIC                            | 7440-38-2  | 10 (A)                                           | 10 (A)                                              | 10                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| BARIUM                             | 7440-39-3  | 2,000 (A,B)                                      | 2,000 (A,B)                                         | 200 (B,G)                                                    | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| CADMIUM                            | 7440-43-9  | 5.0 (A,B)                                        | 5.0 (A,B)                                           | 1.3 (B,G,X)                                                  | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| CALCIUM                            | 7440-70-2  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| CHROMIUM                           | 7440-47-3  | 100 (A,B,H)                                      | 100 (A,B,H)                                         | 40 (B,G,H,X)                                                 | NA                                                                                             | NLV                                                                                               | NLV                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| COPPER                             | 7440-50-8  | 4.0 (B,E)                                        | 4.0 (B,E)                                           | 14 (B,G)                                                     | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| LEAD                               | 7439-92-1  | 4.0 (B,L)                                        | 4.0 (B,L)                                           | 14 (B,G,X)                                                   | NVL                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| MAGNESIUM                          | 7439-95-4  | 400,000 (B)                                      | 1,100,000 (B)                                       | NA                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| MANGANESE                          | 7439-96-5  | 50 (B,E)                                         | 50 (B,E)                                            | 1,000 (B,G,X)                                                | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| MERCURY                            | 7439-97-6  | 2.0 (A,B,Z)                                      | 2.0 (A,B,Z)                                         | 0.0013 (B,Z)                                                 | 56 (B,S,Z)                                                                                     | 56 (B,S,Z)                                                                                        | 56 (B,Z)                | 0.088                                                                       | 0.14                                                    | 1.4                                        | 4.3                                           | 4.3                                           | 8.5                                                         | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| POTASSIUM                          | 7440-09-7  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| SELENIUM                           | 7782-49-2  | 50 (A,B)                                         | 50 (A,B)                                            | 5 (B)                                                        | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| SILVER                             | 7440-22-4  | 34 (B)                                           | 98 (B)                                              | 0.2 (B,M)                                                    | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| SODIUM                             | 7440-23-5  | 230,000 (HH)                                     | 350,000                                             | NA                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| STRONTIUM                          | 7440-24-6  | 4,600 (B)                                        | 13,000 (B)                                          | 21,000 (B)                                                   | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| ZINC                               | 7440-66-6  | 2,400 (B)                                        | 5,000 (B,E)                                         | 63 (B,G)                                                     | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| Organics - PCBs as Aroclors (ug/l) |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |            |         |            |         |            |         |           |         |          |         |          |         |           |         |           |         |
| TOTAL PCBs                         | 1336-36-6  | 0.5 (A,J,T)                                      | 0.5 (A,J,T)                                         | 0.2 (J,M,T)                                                  | 45 (J,S,T)                                                                                     | 45 (J,S,T)                                                                                        | 44.7 (J,T)              | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| Organics - SVOCs (ug/l)            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |            |         |            |         |            |         |           |         |          |         |          |         |           |         |           |         |
| 2-METHYLNAPHTHALENE (SVOC)         | 91-57-6S   | 260                                              | 750                                                 | 19                                                           | 25,000 (S)                                                                                     | 25,000 (S)                                                                                        | 24,600                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| ACENAPHTHENE                       | 83-32-9    | 1,300                                            | 3,800                                               | 38                                                           | 4,200 (S)                                                                                      | 4,200 (S)                                                                                         | 4,240                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| ACENAPHTHYLENE                     | 208-96-8   | 52                                               | 150                                                 | ID                                                           | 3,900 (S)                                                                                      | 3,900 (S)                                                                                         | 3,930                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| ANTHRACENE                         | 120-12-7   | 43 (S)                                           | 43 (S)                                              | ID                                                           | 43 (S)                                                                                         | 43 (S)                                                                                            | 43.4                    | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| BENZO(A)ANTHRACENE                 | 56-55-3    | 2.1 (Q)                                          | 8.5 (Q)                                             | ID                                                           | NLV                                                                                            | NLV                                                                                               | 9.4 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| BENZO(A)PYRENE                     | 50-32-8    | 5.0 (A,Q)                                        | 5.0 (A,Q)                                           | ID                                                           | NLV                                                                                            | NLV                                                                                               | 1.62 (Q)                | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| BENZO(B)FLUORANTHENE               | 205-99-2   | 1.5 (Q,S,AA)                                     | 1.5 (Q,S,AA)                                        | ID                                                           | ID                                                                                             | ID                                                                                                | 1.5 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| BENZO(G,H,I)PERYLENE               | 191-24-2   | 1.0 (M)                                          | 1.0 (M)                                             | ID                                                           | NLV                                                                                            | NLV                                                                                               | 0.26                    | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| BENZO(K)FLUORANTHENE               | 207-08-9   | 1.0 (M,Q)                                        | 1.0 (M,Q)                                           | NA                                                           | NLV                                                                                            | NLV                                                                                               | 0.8 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| CHRYSENE                           | 218-01-9   | 1.6 (Q,S)                                        | 1.6 (Q,S)                                           | ID                                                           | ID                                                                                             | ID                                                                                                | 1.6 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| FLUORANTHENE                       | 206-44-0   | 210 (S)                                          | 210 (S)                                             | 1.6                                                          | 210 (S)                                                                                        | 210 (S)                                                                                           | 206                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| FLUORENE                           | 86-73-7    | 880                                              | 2,000 (S)                                           | 12                                                           | 2,000 (S)                                                                                      | 2,000 (S)                                                                                         | 1,980                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| INDENO(1,2,3-CD)PYRENE             | 193-39-5   | 2.0 (M,Q)                                        | 2.0 (M,Q)                                           | ID                                                           | NLV                                                                                            | NLV                                                                                               | 0.022 (Q)               | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| NAPHTHALENE (SVOC)                 | 91-20-3S   | 520                                              | 1,500                                               | 11                                                           | 31,000 (S)                                                                                     | 31,000 (S)                                                                                        | 31,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| PENTACHLOROPHENOL                  | 87-86-5    | 1.0 (A)                                          | 1.0 (A)                                             | 1.8 (G,X)                                                    | NLV                                                                                            | NLV                                                                                               | 1.85E+06                | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <0.06 U    | --      | <0.04 U    | --      | <0.04 U    | --      | 0.55      | --      | 0.8      | --      | 0.50     | --      | 0.54      | --      |           |         |
| PHENANTHRENE                       | 85-01-8    | 52                                               | 150                                                 | 2.0 (M)                                                      | 1,000 (S)                                                                                      | 1,000 (S)                                                                                         | 1,000                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| PYRENE                             | 129-00-0   | 140 (S)                                          | 140 (S)                                             | ID                                                           | 140 (S)                                                                                        | 140 (S)                                                                                           | 135                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 12-3  
Summary of Groundwater Analytical Results  
Area M  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code              |            | EGLE Part 201 Generic Cleanup Criteria           |                                                     |                                                              |                                                                                                |                                                                                                   |                         | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                                         |                                            |                                               |                                               |                                                             | Area M     |         |            |         |            |         |           |         |          |         |          |         |           |         |           |         |
|----------------------------|------------|--------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------|-----------------------------------------------|-----------------------------------------------|-------------------------------------------------------------|------------|---------|------------|---------|------------|---------|-----------|---------|----------|---------|----------|---------|-----------|---------|-----------|---------|
| Station Name               | CAS Number | [1]<br>Residential<br>Drinking Water<br>Criteria | [2]<br>Nonresidential<br>Drinking Water<br>Criteria | [3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [4]<br>Residential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [5]<br>Nonresidential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [6]<br>Water Solubility | [8]<br>Shallow<br>Groundwater<br>Residential<br>MSSL                        | [9]<br>Shallow<br>Groundwater<br>Nonresidential<br>MSSL | [10]<br>Groundwater<br>Residential<br>MSSL | [11]<br>Groundwater<br>Residential TS<br>MSSL | [12]<br>Groundwater<br>Nonresidential<br>MSSL | [13]<br>Groundwater<br>Nonresidential<br>MSSL <sub>12</sub> | OW #1      |         | OW #2      |         | OW #3      |         | PW #2     |         |          |         |          |         |           |         |           |         |
| Field Sample ID            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | OW1        |         | OW2        |         | OW3        |         | #2        |         | #2       |         | #2       |         | #2        |         | #2        |         |
| Sample Date                |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 12/14/1994 |         | 12/14/1994 |         | 12/14/1994 |         | 8/28/1994 |         | 1/5/1995 |         | 6/7/1995 |         | 9/11/1995 |         | 1/16/1996 |         |
| Sample Interval (bgs)      |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | --         |         | --         |         | --         |         | --        |         | --       |         | --       |         | --        |         | --        |         |
|                            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | Result     | Exceeds | Result     | Exceeds | Result     | Exceeds | Result    | Exceeds | Result   | Exceeds | Result   | Exceeds | Result    | Exceeds | Result    | Exceeds |
| Organics - VOCs (ug/l)     |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |            |         |            |         |            |         |           |         |          |         |          |         |           |         |           |         |
| 1,1,1-TRICHLOROETHANE      | 71-55-6    | 200 (A)                                          | 200 (A)                                             | 89                                                           | 660,000                                                                                        | 1,300,000 (S)                                                                                     | 1,330,000               | 180                                                                         | 500                                                     | 8,600                                      | 8,600                                         | 24,000                                        | 24,000                                                      | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| 1,2,3-TRIMETHYLBENZENE     | 526-73-8   | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | 43 (JT)                                                                     | 67 (JT)                                                 | 800 (JT)                                   | 2,400 (JT)                                    | 2,300 (JT)                                    | 4,700 (JT)                                                  | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| 1,2,4-TRIMETHYLBENZENE     | 95-63-6    | 63 (E,I)                                         | 63 (E,I)                                            | 17 (I)                                                       | 56,000 (I,S)                                                                                   | 56,000 (I,S)                                                                                      | 55,890 (I)              | 25 (JT)                                                                     | 44 (JT)                                                 | 440 (JT)                                   | 1,300 (JT)                                    | 1,300 (JT)                                    | 2,600 (JT)                                                  | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| 1,3,5-TRIMETHYLBENZENE     | 108-67-8   | 72 (E,I)                                         | 72 (E,I)                                            | 45 (I)                                                       | 61,000 (I,S)                                                                                   | 61,000 (I,S)                                                                                      | 61,150 (I)              | 18 (JT)                                                                     | 30 (JT)                                                 | 310 (JT)                                   | 940 (JT)                                      | 920 (JT)                                      | 1,800 (JT)                                                  | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| 2-METHYLNAPHTHALENE (VOC)  | 91-57-6V   | 260                                              | 750                                                 | 19                                                           | 25,000 (S)                                                                                     | 25,000 (S)                                                                                        | 24,600                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| ACETONE                    | 67-64-1    | 730 (I)                                          | 2100 (I)                                            | 1700 (I)                                                     | 1.0E+9 (D,I,S)                                                                                 | 1.0E+9 (D,I,S)                                                                                    | 1.0E+9 (I)              | 50,000                                                                      | 62,000                                                  | 1.20E+07                                   | 1.20E+07                                      | 2.50E+07                                      | 2.50E+07                                                    | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| BENZENE                    | 71-43-2    | 5.0 (A,I)                                        | 5.0 (A,I)                                           | 12 (I,X)                                                     | 5,600 (I)                                                                                      | 35,000 (I)                                                                                        | 1,750,000 (I)           | 1                                                                           | 2.7                                                     | 14                                         | 82                                            | 66                                            | 130                                                         | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| CYCLOHEXANE                | 110-82-7   | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| ETHYLBENZENE               | 100-41-4   | 74 (E,I)                                         | 74 (E,I)                                            | 18 (I)                                                       | 110,000 (I)                                                                                    | 170,000 (I,S)                                                                                     | 169,000 (I)             | 2.8                                                                         | 7.6                                                     | 45                                         | 450                                           | 210                                           | 420                                                         | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| HEXANE                     | 110-54-3   | 3,000                                            | 8,600                                               | NA                                                           | 12,000 (S)                                                                                     | 12,000 (S)                                                                                        | 12,000                  | 29                                                                          | 85                                                      | 29 (GW)                                    | 33                                            | 85 (GW)                                       | 170 (GW)                                                    | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| ISOPROPYLBENZENE           | 98-82-8    | 800                                              | 2,300                                               | 28                                                           | 56,000 (S)                                                                                     | 56,000 (S)                                                                                        | 56,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| M,P-XYLENE                 | 1330-20-7  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| NAPHTHALENE (VOC)          | 91-20-3V   | 520                                              | 1,500                                               | 11                                                           | 31,000 (S)                                                                                     | 31,000 (S)                                                                                        | 31,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| N-PROPYLBENZENE            | 103-65-1   | 80 (I)                                           | 230 (I)                                             | ID                                                           | ID                                                                                             | ID                                                                                                | NA                      | 43                                                                          | 83                                                      | 4100                                       | 12000                                         | 8100                                          | 8100                                                        | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| O-XYLENE                   | 95-47-6    | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| TETRACHLOROETHYLENE        | 127-18-4   | 5.0 (A)                                          | 5.0 (A)                                             | 11 (X)                                                       | 25,000                                                                                         | 170,000                                                                                           | 200,000                 | 1.5                                                                         | 3                                                       | 96                                         | 96                                            | 190                                           | 380                                                         | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| TOLUENE                    | 108-88-3   | 790 (E,I)                                        | 790 (E,I)                                           | 270 (I)                                                      | 530,000 (I,S)                                                                                  | 530,000 (I,S)                                                                                     | 526,000 (I)             | 300                                                                         | 570                                                     | 23,000                                     | 33,000                                        | 66,000                                        | 66,000                                                      | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| TRICHLOROETHYLENE          | 79-01-6    | 5.0 (A)                                          | 5.0 (A)                                             | 29 (X)                                                       | 2,200                                                                                          | 4,900                                                                                             | 1,100,000               | 0.073 (M)                                                                   | 0.14 (M)                                                | 6.1                                        | 18                                            | 12                                            | 24                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| XYLENE - TOTAL             | 1330-20-7  | 280 (E,I)                                        | 280 (E,I)                                           | 49 (I)                                                       | 190,000 (I,S)                                                                                  | 190,000 (I,S)                                                                                     | 186,000 (I)             | 75 (J)                                                                      | 120 (J)                                                 | 1,200 (J)                                  | 3,600 (J)                                     | 3,500 (J)                                     | 7,100 (J)                                                   | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| Other                      |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |            |         |            |         |            |         |           |         |          |         |          |         |           |         |           |         |
| CHLORIDE (mg/l)            | 16887-00-6 | 250,000 (E)                                      | 250,000 (E)                                         | 50 (FF)                                                      | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| NITROGEN (mg/l)            | 7727-37-9  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| HYDROCARBONS, TOTAL (mg/l) | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| Water Quality Parameters   |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |            |         |            |         |            |         |           |         |          |         |          |         |           |         |           |         |
| TEMPERATURE (°C)           | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| CONDUCTIVITY (mS/cm)       | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| DISSOLVED OXYGEN (%)       | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| pH                         | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |
| TURBIDITY (nTu)            | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM         | --      | NM         | --      | NM         | --      | NM        | --      | NM       | --      | NM       | --      | NM        | --      |           |         |

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 12-3  
Summary of Groundwater Analytical Results  
Area M  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code                      |            | EGLE Part 201 Generic Cleanup Criteria           |                                                     |                                                              |                                                                                                |                                                                                                   |                         | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                                         |                                            |                                               |                                               |                                                             | Area M    |         |           |         |               |         |           |         |            |         |           |         |               |         |               |         |               |         |
|------------------------------------|------------|--------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------|-----------------------------------------------|-----------------------------------------------|-------------------------------------------------------------|-----------|---------|-----------|---------|---------------|---------|-----------|---------|------------|---------|-----------|---------|---------------|---------|---------------|---------|---------------|---------|
| Station Name                       | CAS Number | [1]<br>Residential<br>Drinking Water<br>Criteria | [2]<br>Nonresidential<br>Drinking Water<br>Criteria | [3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [4]<br>Residential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [5]<br>Nonresidential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [6]<br>Water Solubility | [8]<br>Shallow<br>Groundwater<br>Residential<br>MSSL                        | [9]<br>Shallow<br>Groundwater<br>Nonresidential<br>MSSL | [10]<br>Groundwater<br>Residential<br>MSSL | [11]<br>Groundwater<br>Residential TS<br>MSSL | [12]<br>Groundwater<br>Nonresidential<br>MSSL | [13]<br>Groundwater<br>Nonresidential<br>MSSL <sub>12</sub> | PW #2     |         |           |         | PW #3         |         |           |         |            |         |           |         | QMCP-GW37     |         | QMCP-GW38     |         |               |         |
| Field Sample ID                    |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | #2        |         | #2        |         | Dollar Bay #2 |         | #3        |         | #3         |         | #3        |         | Dollar Bay #3 |         | QMCP-GW37 5-9 |         | QMCP-GW38 5-9 |         |
| Sample Date                        |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 3/19/1996 |         | 6/25/1996 |         | 5/20/2010     |         | 9/12/1994 |         | 10/18/1994 |         | 4/15/1997 |         | 5/20/2010     |         | 9/11/2018     |         | 9/11/2018     |         |
| Sample Interval (bgs)              |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | -         |         | -         |         | 33.2 - 44 ft  |         | --        |         | --         |         | -         |         | 46 - 64 ft    |         | 5 - 9 ft      |         | 5 - 9 ft      |         |
|                                    |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | Result    | Exceeds | Result    | Exceeds | Result        | Exceeds | Result    | Exceeds | Result     | Exceeds | Result    | Exceeds | Result        | Exceeds | Result        | Exceeds | Result        | Exceeds |
| Inorganics - Metals (ug/l)         |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |           |         |           |         |               |         |           |         |            |         |           |         |               |         |               |         |               |         |
| ARSENIC                            | 7440-38-2  | 10 (A)                                           | 10 (A)                                              | 10                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | 4.7           | --      | NM        | --      | NM         | --      | NM        | --      | <1 U          | --      | 19            | [1,2,3] | 1.1           | --      |
| BARIUM                             | 7440-39-3  | 2,000 (A,B)                                      | 2,000 (A,B)                                         | 200 (B,G)                                                    | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | 35            | --      | NM        | --      | NM         | --      | NM        | --      | 33            | --      | NM            | --      | NM            | --      |
| CADMIUM                            | 7440-43-9  | 5.0 (A,B)                                        | 5.0 (A,B)                                           | 1.3 (B,G,X)                                                  | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | <0.2 U        | --      | NM        | --      | NM         | --      | NM        | --      | <0.2 U        | --      | <0.2 U        | --      | <0.2 U        | --      |
| CALCIUM                            | 7440-70-2  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM            | --      | NM        | --      | NM         | --      | NM        | --      | NM            | --      | NM            | --      | NM            | --      |
| CHROMIUM                           | 7440-47-3  | 100 (A,B,H)                                      | 100 (A,B,H)                                         | 40 (B,G,H,X)                                                 | NA                                                                                             | NLV                                                                                               | NLV                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | <1 U          | --      | NM        | --      | NM         | --      | NM        | --      | <1 U          | --      | 5.2           | --      | 3.2           | --      |
| COPPER                             | 7440-50-8  | 4.0 (B,E)                                        | 4.0 (B,E)                                           | 14 (B,G)                                                     | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | 5.6           | [3]     | NM        | --      | NM         | --      | NM        | --      | 6.5           | [3]     | 1,400         | [1,2,3] | 42            | [3]     |
| LEAD                               | 7439-92-1  | 4.0 (B,L)                                        | 4.0 (B,L)                                           | 14 (B,G,X)                                                   | NVL                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | <1 U          | --      | NM        | --      | NM         | --      | NM        | --      | <1 U          | --      | 8.4           | [1,2]   | 1.0           | --      |
| MAGNESIUM                          | 7439-95-4  | 400,000 (B)                                      | 1,100,000 (B)                                       | NA                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM            | --      | NM        | --      | NM         | --      | NM        | --      | NM            | --      | NM            | --      | NM            | --      |
| MANGANESE                          | 7439-96-5  | 50 (B,E)                                         | 50 (B,E)                                            | 1,000 (B,G,X)                                                | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | <5 U          | --      | NM        | --      | NM         | --      | NM        | --      | 7.5           | --      | 67            | [1,2]   | 280           | [1,2]   |
| MERCURY                            | 7439-97-6  | 2.0 (A,B,Z)                                      | 2.0 (A,B,Z)                                         | 0.0013 (B,Z)                                                 | 56 (B,S,Z)                                                                                     | 56 (B,S,Z)                                                                                        | 56 (B,Z)                | 0.088                                                                       | 0.14                                                    | 1.4                                        | 4.3                                           | 4.3                                           | 8.5                                                         | NM        | --      | NM        | --      | <0.2 U        | --      | NM        | --      | NM         | --      | NM        | --      | <0.2 U        | --      | NM            | --      | NM            | --      |
| POTASSIUM                          | 7440-09-7  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM            | --      | NM        | --      | NM         | --      | NM        | --      | NM            | --      | NM            | --      | NM            | --      |
| SELENIUM                           | 7782-49-2  | 50 (A,B)                                         | 50 (A,B)                                            | 5 (B)                                                        | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | <1 U          | --      | NM        | --      | NM         | --      | NM        | --      | <1 U          | --      | NM            | --      | NM            | --      |
| SILVER                             | 7440-22-4  | 34 (B)                                           | 98 (B)                                              | 0.2 (B,M)                                                    | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | <0.2 U        | --      | NM        | --      | NM         | --      | NM        | --      | <0.2 U        | --      | 0.3           | [3]     | <0.2 U        | --      |
| SODIUM                             | 7440-23-5  | 230,000 (HH)                                     | 350,000                                             | NA                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM            | --      | NM        | --      | NM         | --      | NM        | --      | NM            | --      | NM            | --      | NM            | --      |
| STRONTIUM                          | 7440-24-6  | 4,600 (B)                                        | 13,000 (B)                                          | 21,000 (B)                                                   | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | 62            | --      | NM        | --      | NM         | --      | NM        | --      | 62            | --      | NM            | --      | NM            | --      |
| ZINC                               | 7440-66-6  | 2,400 (B)                                        | 5,000 (B,E)                                         | 63 (B,G)                                                     | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | <10 U         | --      | NM        | --      | NM         | --      | NM        | --      | <10 U         | --      | 12            | --      | <5.0 U        | --      |
| Organics - PCBs as Aroclors (ug/l) |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |           |         |           |         |               |         |           |         |            |         |           |         |               |         |               |         |               |         |
| TOTAL PCBs                         | 1336-36-6  | 0.5 (A,J,T)                                      | 0.5 (A,J,T)                                         | 0.2 (J,M,T)                                                  | 45 (J,S,T)                                                                                     | 45 (J,S,T)                                                                                        | 44.7 (J,T)              | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM            | --      | NM        | --      | NM         | --      | NM        | --      | NM            | --      | ND            | --      | ND            | --      |
| Organics - SVOCs (ug/l)            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |           |         |           |         |               |         |           |         |            |         |           |         |               |         |               |         |               |         |
| 2-METHYLNAPHTHALENE (SVOC)         | 91-57-6S   | 260                                              | 750                                                 | 19                                                           | 25,000 (S)                                                                                     | 25,000 (S)                                                                                        | 24,600                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | <5 U          | --      | NM        | --      | NM         | --      | NM        | --      | <5 U          | --      | <5.1 U        | --      | <5.1 U        | --      |
| ACENAPHTHENE                       | 83-32-9    | 1,300                                            | 3,800                                               | 38                                                           | 4,200 (S)                                                                                      | 4,200 (S)                                                                                         | 4,240                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | <1 U          | --      | NM        | --      | NM         | --      | NM        | --      | <1 U          | --      | <1.0 U        | --      | <1.0 U        | --      |
| ACENAPHTHYLENE                     | 208-96-8   | 52                                               | 150                                                 | ID                                                           | 3,900 (S)                                                                                      | 3,900 (S)                                                                                         | 3,930                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | <1 U          | --      | NM        | --      | NM         | --      | NM        | --      | <1 U          | --      | <1.0 U        | --      | <1.0 U        | --      |
| ANTHRACENE                         | 120-12-7   | 43 (S)                                           | 43 (S)                                              | ID                                                           | 43 (S)                                                                                         | 43 (S)                                                                                            | 43.4                    | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | <1 U          | --      | NM        | --      | NM         | --      | NM        | --      | <1 U          | --      | <1.0 U        | --      | <1.0 U        | --      |
| BENZO(A)ANTHRACENE                 | 56-55-3    | 2.1 (Q)                                          | 8.5 (Q)                                             | ID                                                           | NLV                                                                                            | NLV                                                                                               | 9.4 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | <1 U          | --      | NM        | --      | NM         | --      | NM        | --      | <1 U          | --      | <1.0 U        | --      | <1.0 U        | --      |
| BENZO(A)PYRENE                     | 50-32-8    | 5.0 (A,Q)                                        | 5.0 (A,Q)                                           | ID                                                           | NLV                                                                                            | NLV                                                                                               | 1.62 (Q)                | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | <1 U          | --      | NM        | --      | NM         | --      | NM        | --      | <1 U          | --      | <1.0 U        | --      | <1.0 U        | --      |
| BENZO(B)FLUORANTHENE               | 205-99-2   | 1.5 (Q,S,AA)                                     | 1.5 (Q,S,AA)                                        | ID                                                           | ID                                                                                             | ID                                                                                                | 1.5 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | <1 U          | --      | NM        | --      | NM         | --      | NM        | --      | <1 U          | --      | <1.0 U        | --      | <1.0 U        | --      |
| BENZO(G,H,I)PERYLENE               | 191-24-2   | 1.0 (M)                                          | 1.0 (M)                                             | ID                                                           | NLV                                                                                            | NLV                                                                                               | 0.26                    | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | <1 UJ         | --      | NM        | --      | NM         | --      | NM        | --      | <1 UJ         | --      | <1.0 U        | --      | <1.0 U        | --      |
| BENZO(K)FLUORANTHENE               | 207-08-9   | 1.0 (M,Q)                                        | 1.0 (M,Q)                                           | NA                                                           | NLV                                                                                            | NLV                                                                                               | 0.8 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | <1 U          | --      | NM        | --      | NM         | --      | NM        | --      | <1 U          | --      | <1.0 U        | --      | <1.0 U        | --      |
| CHRYSENE                           | 218-01-9   | 1.6 (Q,S)                                        | 1.6 (Q,S)                                           | ID                                                           | ID                                                                                             | ID                                                                                                | 1.6 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | <1 U          | --      | NM        | --      | NM         | --      | NM        | --      | <1 U          | --      | <1.0 U        | --      | <1.0 U        | --      |
| FLUORANTHENE                       | 206-44-0   | 210 (S)                                          | 210 (S)                                             | 1.6                                                          | 210 (S)                                                                                        | 210 (S)                                                                                           | 206                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | <1 U          | --      | NM        | --      | NM         | --      | NM        | --      | <1 U          | --      | <1.0 U        | --      | <1.0 U        | --      |
| FLUORENE                           | 86-73-7    | 880                                              | 2,000 (S)                                           | 12                                                           | 2,000 (S)                                                                                      | 2,000 (S)                                                                                         | 1,980                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | <1 U          | --      | NM        | --      | NM         | --      | NM        | --      | <1 U          | --      | <1.0 U        | --      | <1.0 U        | --      |
| INDENO(1,2,3-CD)PYRENE             | 193-39-5   | 2.0 (M,Q)                                        | 2.0 (M,Q)                                           | ID                                                           | NLV                                                                                            | NLV                                                                                               | 0.022 (Q)               | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | <2 UJ         | --      | NM        | --      | NM         | --      | NM        | --      | <2 UJ         | --      | <2.0 U        | --      | <2.0 U        | --      |
| NAPHTHALENE (SVOC)                 | 91-20-3S   | 520                                              | 1,500                                               | 11                                                           | 31,000 (S)                                                                                     | 31,000 (S)                                                                                        | 31,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | <1 U          | --      | NM        | --      | NM         | --      | NM        | --      | <1 U          | --      | <1.0 U        | --      | <1.0 U        | --      |
| PENTACHLOROPHENOL                  | 87-86-5    | 1.0 (A)                                          | 1.0 (A)                                             | 1.8 (G,X)                                                    | NLV                                                                                            | NLV                                                                                               | 1.85E+06                | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 0.51      | --      | 0.35      | --      | NM            | --      | 0.29      | --      | 0.29       | --      | <0.1 U    | --      | NM            | --      | NM            | --      | NM            | --      |
| PHENANTHRENE                       | 85-01-8    | 52                                               | 150                                                 | 2.0 (M)                                                      | 1,000 (S)                                                                                      | 1,000 (S)                                                                                         | 1,000                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | <1 U          | --      | NM        | --      | NM         | --      | NM        | --      | <1 U          | --      | <1.0 U        | --      | <1.0 U        | --      |
| PYRENE                             | 129-00-0   | 140 (S)                                          | 140 (S)                                             | ID                                                           | 140 (S)                                                                                        | 140 (S)                                                                                           | 135                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | <1 U          | --      | NM        | --      | NM         | --      | NM        | --      | <1 U          | --      | <1.0 U        | --      | <1.0 U        | --      |

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 12-3  
Summary of Groundwater Analytical Results  
Area M  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code              |            | EGLE Part 201 Generic Cleanup Criteria           |                                                     |                                                              |                                                                                                |                                                                                                   |                         | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                                         |                                            |                                               |                                               |                                                             | Area M    |         |           |         |               |         |           |         |            |         |           |         |               |         |               |         |               |         |
|----------------------------|------------|--------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------|-----------------------------------------------|-----------------------------------------------|-------------------------------------------------------------|-----------|---------|-----------|---------|---------------|---------|-----------|---------|------------|---------|-----------|---------|---------------|---------|---------------|---------|---------------|---------|
| Station Name               | CAS Number | [1]<br>Residential<br>Drinking Water<br>Criteria | [2]<br>Nonresidential<br>Drinking Water<br>Criteria | [3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [4]<br>Residential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [5]<br>Nonresidential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [6]<br>Water Solubility | [8]<br>Shallow<br>Groundwater<br>Residential<br>MSSL                        | [9]<br>Shallow<br>Groundwater<br>Nonresidential<br>MSSL | [10]<br>Groundwater<br>Residential<br>MSSL | [11]<br>Groundwater<br>Residential TS<br>MSSL | [12]<br>Groundwater<br>Nonresidential<br>MSSL | [13]<br>Groundwater<br>Nonresidential<br>MSSL <sub>12</sub> | PW #2     |         |           |         |               |         | PW #3     |         |            |         |           |         | QMCP-GW37     |         | QMCP-GW38     |         |               |         |
| Field Sample ID            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | #2        |         | #2        |         | Dollar Bay #2 |         | #3        |         | #3         |         | #3        |         | Dollar Bay #3 |         | QMCP-GW37 5-9 |         | QMCP-GW38 5-9 |         |
| Sample Date                |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 3/19/1996 |         | 6/25/1996 |         | 5/20/2010     |         | 9/12/1994 |         | 10/18/1994 |         | 4/15/1997 |         | 5/20/2010     |         | 9/11/2018     |         | 9/11/2018     |         |
| Sample Interval (bgs)      |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | --        |         | --        |         | 33.2 - 44 ft  |         | --        |         | --         |         | --        |         | 46 - 64 ft    |         | 5 - 9 ft      |         | 5 - 9 ft      |         |
|                            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | Result    | Exceeds | Result    | Exceeds | Result        | Exceeds | Result    | Exceeds | Result     | Exceeds | Result    | Exceeds | Result        | Exceeds | Result        | Exceeds | Result        | Exceeds |
| Organics - VOCs (ug/l)     |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |           |         |           |         |               |         |           |         |            |         |           |         |               |         |               |         |               |         |
| 1,1,1-TRICHLOROETHANE      | 71-55-6    | 200 (A)                                          | 200 (A)                                             | 89                                                           | 660,000                                                                                        | 1,300,000 (S)                                                                                     | 1,330,000               | 180                                                                         | 500                                                     | 8,600                                      | 8,600                                         | 24,000                                        | 24,000                                                      | NM        | --      | NM        | --      | <1 U          | --      | NM        | --      | NM         | --      | <1 U      | --      | <1.0 U        | --      | <1.0 U        | --      |               |         |
| 1,2,3-TRIMETHYLBENZENE     | 526-73-8   | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | 43 (JT)                                                                     | 67 (JT)                                                 | 800 (JT)                                   | 2,400 (JT)                                    | 2,300 (JT)                                    | 4,700 (JT)                                                  | NM        | --      | NM        | --      | <1 U          | --      | NM        | --      | NM         | --      | <1 U      | --      | <1.0 U        | --      | <1.0 U        | --      |               |         |
| 1,2,4-TRIMETHYLBENZENE     | 95-63-6    | 63 (E,I)                                         | 63 (E,I)                                            | 17 (I)                                                       | 56,000 (I,S)                                                                                   | 56,000 (I,S)                                                                                      | 55,890 (I)              | 25 (JT)                                                                     | 44 (JT)                                                 | 440 (JT)                                   | 1,300 (JT)                                    | 1,300 (JT)                                    | 2,600 (JT)                                                  | NM        | --      | NM        | --      | <1 U          | --      | NM        | --      | NM         | --      | <1 U      | --      | <1.0 U        | --      | <1.0 U        | --      |               |         |
| 1,3,5-TRIMETHYLBENZENE     | 108-67-8   | 72 (E,I)                                         | 72 (E,I)                                            | 45 (I)                                                       | 61,000 (I,S)                                                                                   | 61,000 (I,S)                                                                                      | 61,150 (I)              | 18 (JT)                                                                     | 30 (JT)                                                 | 310 (JT)                                   | 940 (JT)                                      | 920 (JT)                                      | 1,800 (JT)                                                  | NM        | --      | NM        | --      | <1 U          | --      | NM        | --      | NM         | --      | <1 U      | --      | <1.0 U        | --      | <1.0 U        | --      |               |         |
| 2-METHYLNAPHTHALENE (VOC)  | 91-57-6V   | 260                                              | 750                                                 | 19                                                           | 25,000 (S)                                                                                     | 25,000 (S)                                                                                        | 24,600                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | <5 U          | --      | NM        | --      | NM         | --      | <5 U      | --      | <5.0 U        | --      | <5.0 U        | --      |               |         |
| ACETONE                    | 67-64-1    | 730 (I)                                          | 2100 (I)                                            | 1700 (I)                                                     | 1.0E+9 (D,I,S)                                                                                 | 1.0E+9 (D,I,S)                                                                                    | 1.0E+9 (I)              | 50,000                                                                      | 62,000                                                  | 1.20E+07                                   | 1.20E+07                                      | 2.50E+07                                      | 2.50E+07                                                    | NM        | --      | NM        | --      | <20 U         | --      | NM        | --      | NM         | --      | <20 U     | --      | <20 U         | --      | <20 U         | --      |               |         |
| BENZENE                    | 71-43-2    | 5.0 (A,I)                                        | 5.0 (A,I)                                           | 12 (I,X)                                                     | 5,600 (I)                                                                                      | 35,000 (I)                                                                                        | 1,750,000 (I)           | 1                                                                           | 2.7                                                     | 14                                         | 82                                            | 66                                            | 130                                                         | NM        | --      | NM        | --      | <1 U          | --      | NM        | --      | NM         | --      | <1 U      | --      | <1.0 U        | --      | <1.0 U        | --      |               |         |
| CYCLOHEXANE                | 110-82-7   | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | <5 U          | --      | NM        | --      | NM         | --      | <5 U      | --      | <5.0 U        | --      | <5.0 U        | --      |               |         |
| ETHYLBENZENE               | 100-41-4   | 74 (E,I)                                         | 74 (E,I)                                            | 18 (I)                                                       | 110,000 (I)                                                                                    | 170,000 (I,S)                                                                                     | 169,000 (I)             | 2.8                                                                         | 7.6                                                     | 45                                         | 450                                           | 210                                           | 420                                                         | NM        | --      | NM        | --      | <1 U          | --      | NM        | --      | NM         | --      | <1 U      | --      | <1.0 U        | --      | <1.0 U        | --      |               |         |
| HEXANE                     | 110-54-3   | 3,000                                            | 8,600                                               | NA                                                           | 12,000 (S)                                                                                     | 12,000 (S)                                                                                        | 12,000                  | 29                                                                          | 85                                                      | 29 (GW)                                    | 33                                            | 85 (GW)                                       | 170 (GW)                                                    | NM        | --      | NM        | --      | NM            | --      | NM        | --      | NM         | --      | NM        | --      | <1.0 U        | --      | <1.0 U        | --      |               |         |
| ISOPROPYLBENZENE           | 98-82-8    | 800                                              | 2,300                                               | 28                                                           | 56,000 (S)                                                                                     | 56,000 (S)                                                                                        | 56,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | <1 U          | --      | NM        | --      | NM         | --      | <1 U      | --      | <1.0 U        | --      | <1.0 U        | --      |               |         |
| M,P-XYLENE                 | 1330-20-7  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | <2 U          | --      | NM        | --      | NM         | --      | <2 U      | --      | <2.0 U        | --      | <2.0 U        | --      |               |         |
| NAPHTHALENE (VOC)          | 91-20-3V   | 520                                              | 1,500                                               | 11                                                           | 31,000 (S)                                                                                     | 31,000 (S)                                                                                        | 31,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | <5 U          | --      | NM        | --      | NM         | --      | <5 U      | --      | <5.0 U        | --      | <5.0 U        | --      |               |         |
| N-PROPYLBENZENE            | 103-65-1   | 80 (I)                                           | 230 (I)                                             | ID                                                           | ID                                                                                             | ID                                                                                                | NA                      | 43                                                                          | 83                                                      | 4100                                       | 12000                                         | 8100                                          | 8100                                                        | NM        | --      | NM        | --      | <1 U          | --      | NM        | --      | NM         | --      | <1 U      | --      | <1.0 U        | --      | <1.0 U        | --      |               |         |
| O-XYLENE                   | 95-47-6    | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | <1 U          | --      | NM        | --      | NM         | --      | <1 U      | --      | <1.0 U        | --      | <1.0 U        | --      |               |         |
| TETRACHLOROETHYLENE        | 127-18-4   | 5.0 (A)                                          | 5.0 (A)                                             | 11 (X)                                                       | 25,000                                                                                         | 170,000                                                                                           | 200,000                 | 1.5                                                                         | 3                                                       | 96                                         | 96                                            | 190                                           | 380                                                         | NM        | --      | NM        | --      | <1 U          | --      | NM        | --      | NM         | --      | <1 U      | --      | <1.0 U        | --      | <1.0 U        | --      |               |         |
| TOLUENE                    | 108-88-3   | 790 (E,I)                                        | 790 (E,I)                                           | 270 (I)                                                      | 530,000 (I,S)                                                                                  | 530,000 (I,S)                                                                                     | 526,000 (I)             | 300                                                                         | 570                                                     | 23,000                                     | 33,000                                        | 66,000                                        | 66,000                                                      | NM        | --      | NM        | --      | <1 U          | --      | NM        | --      | NM         | --      | <1 U      | --      | <1.0 U        | --      | <1.0 U        | --      |               |         |
| TRICHLOROETHYLENE          | 79-01-6    | 5.0 (A)                                          | 5.0 (A)                                             | 29 (X)                                                       | 2,200                                                                                          | 4,900                                                                                             | 1,100,000               | 0.073 (M)                                                                   | 0.14 (M)                                                | 6.1                                        | 18                                            | 12                                            | 24                                                          | NM        | --      | NM        | --      | <1 U          | --      | NM        | --      | NM         | --      | <1 U      | --      | <1.0 U        | --      | <1.0 U        | --      |               |         |
| XYLENE - TOTAL             | 1330-20-7  | 280 (E,I)                                        | 280 (E,I)                                           | 49 (I)                                                       | 190,000 (I,S)                                                                                  | 190,000 (I,S)                                                                                     | 186,000 (I)             | 75 (J)                                                                      | 120 (J)                                                 | 1,200 (J)                                  | 3,600 (J)                                     | 3,500 (J)                                     | 7,100 (J)                                                   | NM        | --      | NM        | --      | ND            | --      | NM        | --      | NM         | --      | ND        | --      | ND            | --      | ND            | --      |               |         |
| Other                      |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |           |         |           |         |               |         |           |         |            |         |           |         |               |         |               |         |               |         |
| CHLORIDE (mg/l)            | 16887-00-6 | 250,000 (E)                                      | 250,000 (E)                                         | 50 (FF)                                                      | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM            | --      | NM        | --      | NM         | --      | NM        | --      | NM            | --      | NM            | --      |               |         |
| NITROGEN (mg/l)            | 7727-37-9  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | 0.93          | --      | NM        | --      | NM         | --      | NM        | --      | 1.29          | --      | NM            | --      |               |         |
| HYDROCARBONS, TOTAL (mg/l) | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM            | --      | NM        | --      | NM         | --      | NM        | --      | NM            | --      | NM            | --      |               |         |
| Water Quality Parameters   |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |           |         |           |         |               |         |           |         |            |         |           |         |               |         |               |         |               |         |
| TEMPERATURE (°C)           | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM            | --      | NM        | --      | NM         | --      | NM        | --      | 13.5          | --      | 14.6          | --      |               |         |
| CONDUCTIVITY (mS/cm)       | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM            | --      | NM        | --      | NM         | --      | NM        | --      | 0.235         | --      | 0.256         | --      |               |         |
| DISSOLVED OXYGEN (%)       | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM            | --      | NM        | --      | NM         | --      | NM        | --      | 40.1          | --      | 13.0          | --      |               |         |
| pH                         | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM            | --      | NM        | --      | NM         | --      | NM        | --      | 7.42          | --      | 6.89          | --      |               |         |
| TURBIDITY (nTu)            | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM            | --      | NM        | --      | NM         | --      | NM        | --      | NM            | --      | NM            | --      |               |         |

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 12-3  
Summary of Groundwater Analytical Results  
Area M  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code                      |            | EGLE Part 201 Generic Cleanup Criteria           |                                                     |                                                              |                                                                                                |                                                                                                   |                         | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                                         |                                            |                                               |                                               |                                                             | Area M           |         |                 |         |                |         |                 |         |
|------------------------------------|------------|--------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------|-----------------------------------------------|-----------------------------------------------|-------------------------------------------------------------|------------------|---------|-----------------|---------|----------------|---------|-----------------|---------|
| Station Name                       | CAS Number | [1]<br>Residential<br>Drinking Water<br>Criteria | [2]<br>Nonresidential<br>Drinking Water<br>Criteria | [3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [4]<br>Residential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [5]<br>Nonresidential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [6]<br>Water Solubility | [8]<br>Shallow<br>Groundwater<br>Residential<br>MSSL                        | [9]<br>Shallow<br>Groundwater<br>Nonresidential<br>MSSL | [10]<br>Groundwater<br>Residential<br>MSSL | [11]<br>Groundwater<br>Residential TS<br>MSSL | [12]<br>Groundwater<br>Nonresidential<br>MSSL | [13]<br>Groundwater<br>Nonresidential<br>MSSL <sub>12</sub> | QMCP-GW39        |         | QMCP-GW40       |         | QMCP-GW41      |         | QMCP-GW42       |         |
| Field Sample ID                    |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | QMCP-GW39 8-12ft |         | QMCP-GW40 12-16 |         | QMCP-GW41 9-13 |         | QMCP-GW42 12-16 |         |
| Sample Date                        |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 9/11/2018        |         | 9/10/2018       |         | 9/10/2018      |         | 9/10/2018       |         |
| Sample Interval (bgs)              |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 8 - 12 ft        |         | 12 - 16 ft      |         | 9 - 13 ft      |         | 12 - 16 ft      |         |
|                                    |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | Result           | Exceeds | Result          | Exceeds | Result         | Exceeds | Result          | Exceeds |
| Inorganics - Metals (ug/l)         |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |                  |         |                 |         |                |         |                 |         |
| ARSENIC                            | 7440-38-2  | 10 (A)                                           | 10 (A)                                              | 10                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 16               | [1,2,3] | 14              | [1,2,3] | 8.8            | --      | 2.7             | --      |
| BARIUM                             | 7440-39-3  | 2,000 (A,B)                                      | 2,000 (A,B)                                         | 200 (B,G)                                                    | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM               | --      | NM              | --      | NM             | --      | NM              | --      |
| CADMIUM                            | 7440-43-9  | 5.0 (A,B)                                        | 5.0 (A,B)                                           | 1.3 (B,G,X)                                                  | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <0.2 U           | --      | 0.4             | --      | <0.2 U         | --      | <0.2 U          | --      |
| CALCIUM                            | 7440-70-2  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM               | --      | NM              | --      | NM             | --      | NM              | --      |
| CHROMIUM                           | 7440-47-3  | 100 (A,B,H)                                      | 100 (A,B,H)                                         | 40 (B,G,H,X)                                                 | NA                                                                                             | NLV                                                                                               | NLV                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 16               | --      | 120             | [1,2,3] | 7.3            | --      | 4.1             | --      |
| COPPER                             | 7440-50-8  | 4.0 (B,E)                                        | 4.0 (B,E)                                           | 14 (B,G)                                                     | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 210              | [3]     | 4,200           | [1,2,3] | 46             | [3]     | 39              | [3]     |
| LEAD                               | 7439-92-1  | 4.0 (B,L)                                        | 4.0 (B,L)                                           | 14 (B,G,X)                                                   | NVL                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 2.0              | --      | 9               | [1,2]   | 1.4            | --      | <1.0 U          | --      |
| MAGNESIUM                          | 7439-95-4  | 400,000 (B)                                      | 1,100,000 (B)                                       | NA                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM               | --      | NM              | --      | NM             | --      | NM              | --      |
| MANGANESE                          | 7439-96-5  | 50 (B,E)                                         | 50 (B,E)                                            | 1,000 (B,G,X)                                                | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 220              | [1,2]   | 970             | [1,2]   | 400            | [1,2]   | 200             | [1,2]   |
| MERCURY                            | 7439-97-6  | 2.0 (A,B,Z)                                      | 2.0 (A,B,Z)                                         | 0.0013 (B,Z)                                                 | 56 (B,S,Z)                                                                                     | 56 (B,S,Z)                                                                                        | 56 (B,Z)                | 0.088                                                                       | 0.14                                                    | 1.4                                        | 4.3                                           | 4.3                                           | 8.5                                                         | NM               | --      | <0.2 U          | --      | <0.2 U         | --      | <0.2 U          | --      |
| POTASSIUM                          | 7440-09-7  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM               | --      | NM              | --      | NM             | --      | NM              | --      |
| SELENIUM                           | 7782-49-2  | 50 (A,B)                                         | 50 (A,B)                                            | 5 (B)                                                        | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM               | --      | NM              | --      | NM             | --      | NM              | --      |
| SILVER                             | 7440-22-4  | 34 (B)                                           | 98 (B)                                              | 0.2 (B,M)                                                    | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <0.2 U           | --      | 0.7             | [3]     | 0.4            | [3]     | <0.2 U          | --      |
| SODIUM                             | 7440-23-5  | 230,000 (HH)                                     | 350,000                                             | NA                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM               | --      | NM              | --      | NM             | --      | NM              | --      |
| STRONTIUM                          | 7440-24-6  | 4,600 (B)                                        | 13,000 (B)                                          | 21,000 (B)                                                   | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM               | --      | NM              | --      | NM             | --      | NM              | --      |
| ZINC                               | 7440-66-6  | 2,400 (B)                                        | 5,000 (B,E)                                         | 63 (B,G)                                                     | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 22               | --      | 160             | [3]     | 8.4            | --      | <5.0 U          | --      |
| Organics - PCBs as Aroclors (ug/l) |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |                  |         |                 |         |                |         |                 |         |
| TOTAL PCBs                         | 1336-36-6  | 0.5 (A,J,T)                                      | 0.5 (A,J,T)                                         | 0.2 (J,M,T)                                                  | 45 (J,S,T)                                                                                     | 45 (J,S,T)                                                                                        | 44.7 (J,T)              | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | ND               | --      | ND              | --      | ND             | --      | ND              | --      |
| Organics - SVOCs (ug/l)            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |                  |         |                 |         |                |         |                 |         |
| 2-METHYLNAPHTHALENE (SVOC)         | 91-57-6S   | 260                                              | 750                                                 | 19                                                           | 25,000 (S)                                                                                     | 25,000 (S)                                                                                        | 24,600                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5.0 U           | --      | <5.0 U          | --      | <5.0 U         | --      | <5 UJ           | --      |
| ACENAPHTHENE                       | 83-32-9    | 1,300                                            | 3,800                                               | 38                                                           | 4,200 (S)                                                                                      | 4,200 (S)                                                                                         | 4,240                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1.0 U           | --      | <1.0 U          | --      | <1.0 U         | --      | <1 UJ           | --      |
| ACENAPHTHYLENE                     | 208-96-8   | 52                                               | 150                                                 | ID                                                           | 3,900 (S)                                                                                      | 3,900 (S)                                                                                         | 3,930                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1.0 U           | --      | <1.0 U          | --      | <1.0 U         | --      | <1 UJ           | --      |
| ANTHRACENE                         | 120-12-7   | 43 (S)                                           | 43 (S)                                              | ID                                                           | 43 (S)                                                                                         | 43 (S)                                                                                            | 43.4                    | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1.0 U           | --      | <1.0 U          | --      | <1.0 U         | --      | <1 UJ           | --      |
| BENZO(A)ANTHRACENE                 | 56-55-3    | 2.1 (Q)                                          | 8.5 (Q)                                             | ID                                                           | NLV                                                                                            | NLV                                                                                               | 9.4 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1.0 U           | --      | <1.0 U          | --      | <1.0 U         | --      | <1 UJ           | --      |
| BENZO(A)PYRENE                     | 50-32-8    | 5.0 (A,Q)                                        | 5.0 (A,Q)                                           | ID                                                           | NLV                                                                                            | NLV                                                                                               | 1.62 (Q)                | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1.0 U           | --      | <1.0 U          | --      | <1.0 U         | --      | <1 UJ           | --      |
| BENZO(B)FLUORANTHENE               | 205-99-2   | 1.5 (Q,S,AA)                                     | 1.5 (Q,S,AA)                                        | ID                                                           | ID                                                                                             | ID                                                                                                | 1.5 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1.0 U           | --      | <1.0 U          | --      | <1.0 U         | --      | <1 UJ           | --      |
| BENZO(G,H,I)PERYLENE               | 191-24-2   | 1.0 (M)                                          | 1.0 (M)                                             | ID                                                           | NLV                                                                                            | NLV                                                                                               | 0.26                    | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1.0 U           | --      | <1.0 U          | --      | <1.0 U         | --      | <1 UJ           | --      |
| BENZO(K)FLUORANTHENE               | 207-08-9   | 1.0 (M,Q)                                        | 1.0 (M,Q)                                           | NA                                                           | NLV                                                                                            | NLV                                                                                               | 0.8 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1.0 U           | --      | <1.0 U          | --      | <1.0 U         | --      | <1 UJ           | --      |
| CHRYSENE                           | 218-01-9   | 1.6 (Q,S)                                        | 1.6 (Q,S)                                           | ID                                                           | ID                                                                                             | ID                                                                                                | 1.6 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1.0 U           | --      | <1.0 U          | --      | <1.0 U         | --      | <1 UJ           | --      |
| FLUORANTHENE                       | 206-44-0   | 210 (S)                                          | 210 (S)                                             | 1.6                                                          | 210 (S)                                                                                        | 210 (S)                                                                                           | 206                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1.0 U           | --      | <1.0 U          | --      | <1.0 U         | --      | <1 UJ           | --      |
| FLUORENE                           | 86-73-7    | 880                                              | 2,000 (S)                                           | 12                                                           | 2,000 (S)                                                                                      | 2,000 (S)                                                                                         | 1,980                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1.0 U           | --      | <1.0 U          | --      | <1.0 U         | --      | <1 UJ           | --      |
| INDENO(1,2,3-CD)PYRENE             | 193-39-5   | 2.0 (M,Q)                                        | 2.0 (M,Q)                                           | ID                                                           | NLV                                                                                            | NLV                                                                                               | 0.022 (Q)               | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <2.0 U           | --      | <2.0 U          | --      | <2.0 U         | --      | <2 UJ           | --      |
| NAPHTHALENE (SVOC)                 | 91-20-3S   | 520                                              | 1,500                                               | 11                                                           | 31,000 (S)                                                                                     | 31,000 (S)                                                                                        | 31,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1.0 U           | --      | <1.0 U          | --      | <1.0 U         | --      | <1 UJ           | --      |
| PENTACHLOROPHENOL                  | 87-86-5    | 1.0 (A)                                          | 1.0 (A)                                             | 1.8 (G,X)                                                    | NLV                                                                                            | NLV                                                                                               | 1.85E+06                | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM               | --      | NM              | --      | NM             | --      | <20 UJ          | --      |
| PHENANTHRENE                       | 85-01-8    | 52                                               | 150                                                 | 2.0 (M)                                                      | 1,000 (S)                                                                                      | 1,000 (S)                                                                                         | 1,000                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1.0 U           | --      | <1.0 U          | --      | <1.0 U         | --      | <1 UJ           | --      |
| PYRENE                             | 129-00-0   | 140 (S)                                          | 140 (S)                                             | ID                                                           | 140 (S)                                                                                        | 140 (S)                                                                                           | 135                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1.0 U           | --      | <1.0 U          | --      | <1.0 U         | --      | <1 UJ           | --      |

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 12-3  
Summary of Groundwater Analytical Results  
Area M  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code              |            | EGLE Part 201 Generic Cleanup Criteria           |                                                     |                                                              |                                                                                                |                                                                                                   |                         | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                                         |                                            |                                               |                                               |                                                             | Area M           |         |                 |         |                |         |                 |         |
|----------------------------|------------|--------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------|-----------------------------------------------|-----------------------------------------------|-------------------------------------------------------------|------------------|---------|-----------------|---------|----------------|---------|-----------------|---------|
| Station Name               | CAS Number | [1]<br>Residential<br>Drinking Water<br>Criteria | [2]<br>Nonresidential<br>Drinking Water<br>Criteria | [3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [4]<br>Residential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [5]<br>Nonresidential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [6]<br>Water Solubility | [8]<br>Shallow<br>Groundwater<br>Residential<br>MSSL                        | [9]<br>Shallow<br>Groundwater<br>Nonresidential<br>MSSL | [10]<br>Groundwater<br>Residential<br>MSSL | [11]<br>Groundwater<br>Residential TS<br>MSSL | [12]<br>Groundwater<br>Nonresidential<br>MSSL | [13]<br>Groundwater<br>Nonresidential<br>MSSL <sub>12</sub> | QMCP-GW39        |         | QMCP-GW40       |         | QMCP-GW41      |         | QMCP-GW42       |         |
| Field Sample ID            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | QMCP-GW39 8-12ft |         | QMCP-GW40 12-16 |         | QMCP-GW41 9-13 |         | QMCP-GW42 12-16 |         |
| Sample Date                |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 9/11/2018        |         | 9/10/2018       |         | 9/10/2018      |         | 9/10/2018       |         |
| Sample Interval (bgs)      |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 8 - 12 ft        |         | 12 - 16 ft      |         | 9 - 13 ft      |         | 12 - 16 ft      |         |
|                            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | Result           | Exceeds | Result          | Exceeds | Result         | Exceeds | Result          | Exceeds |
| Organics - VOCs (ug/l)     |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |                  |         |                 |         |                |         |                 |         |
| 1,1,1-TRICHLOROETHANE      | 71-55-6    | 200 (A)                                          | 200 (A)                                             | 89                                                           | 660,000                                                                                        | 1,300,000 (S)                                                                                     | 1,330,000               | 180                                                                         | 500                                                     | 8,600                                      | 8,600                                         | 24,000                                        | 24,000                                                      | <1.0 U           | --      | <1.0 U          | --      | <1.0 U         | --      | <1.0 U          | --      |
| 1,2,3-TRIMETHYLBENZENE     | 526-73-8   | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | 43 (JT)                                                                     | 67 (JT)                                                 | 800 (JT)                                   | 2,400 (JT)                                    | 2,300 (JT)                                    | 4,700 (JT)                                                  | <1.0 U           | --      | <1.0 U          | --      | <1.0 U         | --      | <1.0 U          | --      |
| 1,2,4-TRIMETHYLBENZENE     | 95-63-6    | 63 (E,I)                                         | 63 (E,I)                                            | 17 (I)                                                       | 56,000 (I,S)                                                                                   | 56,000 (I,S)                                                                                      | 55,890 (I)              | 25 (JT)                                                                     | 44 (JT)                                                 | 440 (JT)                                   | 1,300 (JT)                                    | 1,300 (JT)                                    | 2,600 (JT)                                                  | <1.0 U           | --      | <1.0 U          | --      | <1.0 U         | --      | <1.0 U          | --      |
| 1,3,5-TRIMETHYLBENZENE     | 108-67-8   | 72 (E,I)                                         | 72 (E,I)                                            | 45 (I)                                                       | 61,000 (I,S)                                                                                   | 61,000 (I,S)                                                                                      | 61,150 (I)              | 18 (JT)                                                                     | 30 (JT)                                                 | 310 (JT)                                   | 940 (JT)                                      | 920 (JT)                                      | 1,800 (JT)                                                  | <1.0 U           | --      | <1.0 U          | --      | <1.0 U         | --      | <1.0 U          | --      |
| 2-METHYLNAPHTHALENE (VOC)  | 91-57-6V   | 260                                              | 750                                                 | 19                                                           | 25,000 (S)                                                                                     | 25,000 (S)                                                                                        | 24,600                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5.0 U           | --      | <5.0 U          | --      | <5.0 U         | --      | <5.0 U          | --      |
| ACETONE                    | 67-64-1    | 730 (I)                                          | 2100 (I)                                            | 1700 (I)                                                     | 1.0E+9 (D,I,S)                                                                                 | 1.0E+9 (D,I,S)                                                                                    | 1.0E+9 (I)              | 50,000                                                                      | 62,000                                                  | 1.20E+07                                   | 1.20E+07                                      | 2.50E+07                                      | 2.50E+07                                                    | <20 U            | --      | <20 U           | --      | <20 U          | --      | <20 U           | --      |
| BENZENE                    | 71-43-2    | 5.0 (A,I)                                        | 5.0 (A,I)                                           | 12 (I,X)                                                     | 5,600 (I)                                                                                      | 35,000 (I)                                                                                        | 1,750,000 (I)           | 1                                                                           | 2.7                                                     | 14                                         | 82                                            | 66                                            | 130                                                         | <1.0 U           | --      | <1.0 U          | --      | <1.0 U         | --      | <1.0 U          | --      |
| CYCLOHEXANE                | 110-82-7   | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5.0 U           | --      | <5.0 U          | --      | <5.0 U         | --      | <5.0 U          | --      |
| ETHYLBENZENE               | 100-41-4   | 74 (E,I)                                         | 74 (E,I)                                            | 18 (I)                                                       | 110,000 (I)                                                                                    | 170,000 (I,S)                                                                                     | 169,000 (I)             | 2.8                                                                         | 7.6                                                     | 45                                         | 450                                           | 210                                           | 420                                                         | <1.0 U           | --      | <1.0 U          | --      | <1.0 U         | --      | <1.0 U          | --      |
| HEXANE                     | 110-54-3   | 3,000                                            | 8,600                                               | NA                                                           | 12,000 (S)                                                                                     | 12,000 (S)                                                                                        | 12,000                  | 29                                                                          | 85                                                      | 29 (GW)                                    | 33                                            | 85 (GW)                                       | 170 (GW)                                                    | <1.0 U           | --      | <1.0 U          | --      | <1.0 U         | --      | <1.0 U          | --      |
| ISOPROPYLBENZENE           | 98-82-8    | 800                                              | 2,300                                               | 28                                                           | 56,000 (S)                                                                                     | 56,000 (S)                                                                                        | 56,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1.0 U           | --      | <1.0 U          | --      | <1.0 U         | --      | <1.0 U          | --      |
| M,P-XYLENE                 | 1330-20-7  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <2.0 U           | --      | <2.0 U          | --      | <2.0 U         | --      | <2.0 U          | --      |
| NAPHTHALENE (VOC)          | 91-20-3V   | 520                                              | 1,500                                               | 11                                                           | 31,000 (S)                                                                                     | 31,000 (S)                                                                                        | 31,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <5.0 U           | --      | <5.0 U          | --      | <5.0 U         | --      | <5.0 U          | --      |
| N-PROPYLBENZENE            | 103-65-1   | 80 (I)                                           | 230 (I)                                             | ID                                                           | ID                                                                                             | ID                                                                                                | NA                      | 43                                                                          | 83                                                      | 4100                                       | 12000                                         | 8100                                          | 8100                                                        | <1.0 U           | --      | <1.0 U          | --      | <1.0 U         | --      | <1.0 U          | --      |
| O-XYLENE                   | 95-47-6    | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <1.0 U           | --      | <1.0 U          | --      | <1.0 U         | --      | <1.0 U          | --      |
| TETRACHLOROETHYLENE        | 127-18-4   | 5.0 (A)                                          | 5.0 (A)                                             | 11 (X)                                                       | 25,000                                                                                         | 170,000                                                                                           | 200,000                 | 1.5                                                                         | 3                                                       | 96                                         | 96                                            | 190                                           | 380                                                         | <1.0 U           | --      | <1.0 U          | --      | <1.0 U         | --      | <1.0 U          | --      |
| TOLUENE                    | 108-88-3   | 790 (E,I)                                        | 790 (E,I)                                           | 270 (I)                                                      | 530,000 (I,S)                                                                                  | 530,000 (I,S)                                                                                     | 526,000 (I)             | 300                                                                         | 570                                                     | 23,000                                     | 33,000                                        | 66,000                                        | 66,000                                                      | <1.0 U           | --      | <1.0 U          | --      | <1.0 U         | --      | <1.0 U          | --      |
| TRICHLOROETHYLENE          | 79-01-6    | 5.0 (A)                                          | 5.0 (A)                                             | 29 (X)                                                       | 2,200                                                                                          | 4,900                                                                                             | 1,100,000               | 0.073 (M)                                                                   | 0.14 (M)                                                | 6.1                                        | 18                                            | 12                                            | 24                                                          | <1.0 U           | --      | <1.0 U          | --      | <1.0 U         | --      | <1.0 U          | --      |
| XYLENE - TOTAL             | 1330-20-7  | 280 (E,I)                                        | 280 (E,I)                                           | 49 (I)                                                       | 190,000 (I,S)                                                                                  | 190,000 (I,S)                                                                                     | 186,000 (I)             | 75 (J)                                                                      | 120 (J)                                                 | 1,200 (J)                                  | 3,600 (J)                                     | 3,500 (J)                                     | 7,100 (J)                                                   | ND               | --      | ND              | --      | ND             | --      | ND              | --      |
| Other                      |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |                  |         |                 |         |                |         |                 |         |
| CHLORIDE (mg/l)            | 16887-00-6 | 250,000 (E)                                      | 250,000 (E)                                         | 50 (FF)                                                      | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM               | --      | NM              | --      | NM             | --      | NM              | --      |
| NITROGEN (mg/l)            | 7727-37-9  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM               | --      | NM              | --      | NM             | --      | NM              | --      |
| HYDROCARBONS, TOTAL (mg/l) | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM               | --      | NM              | --      | NM             | --      | NM              | --      |
| Water Quality Parameters   |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |                  |         |                 |         |                |         |                 |         |
| TEMPERATURE (°C)           | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 14.5             | --      | 13.1            | --      | 13.8           | --      | 13.9            | --      |
| CONDUCTIVITY (mS/cm)       | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 0.200            | --      | 0.190           | --      | 0.204          | --      | 0.103           | --      |
| DISSOLVED OXYGEN (%)       | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 87.9             | --      | 70.0            | --      | 7.0            | --      | 39.7            | --      |
| pH                         | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | 7.35             | --      | 6.48            | --      | 6.79           | --      | 7.28            | --      |
| TURBIDITY (nTu)            | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM               | --      | NM              | --      | NM             | --      | NM              | --      |

Note: Analytical and Criteria Footnotes are included on the last page of the table.



TABLE 12-3  
Summary of Groundwater Analytical Results  
Area M  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Groundwater Table Footnotes:

- EGLE Part 201 residential and non-residential generic cleanup criteria and screening levels criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Release Date: December 30, 2013. Updated December 21, 2020.

- Only detected analytes are listed - Gray rows indicate requested analyses. If no analytes are listed below a gray row then all analytes of that group were either not analyzed or not detected.

- **Bold** values are concentrations detected above the laboratory reporting limit.

- **Bold/Shaded** cells indicate analyte concentration exceeded applicable criteria. EGLE Part 201 criteria exceeded is indicated by the footnote in [brackets] following the result value and defined below:

|                                                                                   |                                                    |
|-----------------------------------------------------------------------------------|----------------------------------------------------|
| [1] - Residential Drinking Water Criteria                                         | [8] Shallow Groundwater Residential MSSL           |
| [2] - Nonresidential Drinking Water Criteria                                      | [9] Shallow Groundwater Nonresidential MSSL        |
| [3] - Groundwater Surface Water Interface Criteria                                | [10] Groundwater Residential MSSL                  |
| [4] - Water Solubility                                                            | [11] Groundwater Residential TS MSSL               |
| [5] - Residential Groundwater Volatilization to Indoor Air Inhalation Criteria    | [12] Groundwater Nonresidential MSSL               |
| [6] - Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria | [13] Groundwater Nonresidential MSSL <sub>12</sub> |
| [7] - Flammability and Explosivity Screening Level                                | [14] Groundwater Nonresidential TS MSSL            |

Evaluation based on EGLE Criteria at time of Project completion.

|                                       |                                                                                                     |
|---------------------------------------|-----------------------------------------------------------------------------------------------------|
| -- = No Exceedances                   | mg/l = Milligrams per liter                                                                         |
| ND = Not Detected                     | °C = Degrees Celsius                                                                                |
| NM = Not Measured                     | mS/cm = MilliSiemens per centimeter                                                                 |
| bgs = Below ground surface            | % = Percentage                                                                                      |
| ft = Feet                             | nTu = Nephelometric Turbidity Unit                                                                  |
| PCBs = Polychlorinated biphenyls      | pH = pH acid-base scale                                                                             |
| SVOC = Semi-volatile organic compound | MSSL = Media-Specific Volatilization to Indoor Air Interim Action Screening Level                   |
| VOC = Volatile organic compound       | TS MSSL = Time Sensitive Media-Specific Volatilization to Indoor Air Interim Action Screening Level |
| ug/l = Micrograms per liter           |                                                                                                     |

Groundwater Table Footnotes:

ID = Insufficient data to develop criterion.

NA = A criterion or value is not available

NLV = Hazardous substance is not likely to volatilize under most conditions.

(A) = Criterion is the state of Michigan drinking water standard established pursuant to Section 5 of 1976 PA 399, MCL 325.1005.

(AA) = Use 10,000 ug/l where groundwater enters a structure through the use of a water well, sump or other device. Use 28,000 ug/l for all other uses.

(B) = Background, as defined in R 299.1(b), may be substituted if higher than the calculated cleanup criterion. Background levels may be less than criteria for some inorganic compounds.

(D) = Calculated criterion exceeds 100 percent, hence it is reduced to 100 percent or 1.0E+9 parts per billion (ppb).

(E) = Criterion is the aesthetic drinking water value, as required by Section 20120a(5) of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA). A notice of aesthetic impact may be employed as an institutional control mechanism if groundwater concentrations exceed the aesthetic drinking water criterion, but do not exceed the applicable health-based drinking water value provided in a table available on the Department of Environment, Great Lakes, and Energy (EGLE) internet web site. (See R 299.49 Footnotes for generic cleanup criteria tables for additional information)

(FF) = The chloride GSI criterion shall be 125 mg/l when the discharge is to surface waters of the state designated as public water supply sources or 50 mg/l when the discharge is to the Great Lakes or connecting waters. Chloride GSI criteria shall not apply for surface waters of the state that are not designated as a public water supply source, however, the total dissolved solids criterion is applicable.

(G) = Groundwater surface water interface (GSI) criterion depends on the pH or water hardness, or both, of the receiving surface water. The final chronic value (FCV) for the protection of aquatic life shall be calculated based on the pH or hardness of the receiving surface water. Where water hardness exceeds 400 mg CaCO<sub>3</sub>/L, use 400 mg CaCO<sub>3</sub>/L for the FCV calculation. The FCV formula provides values in units of ug/L or ppb. The generic GSI criterion is the lesser of the calculated FCV, the wildlife value (WV), and the surface water human non-drinking water value (HNDV). The soil GSI protection criteria for these hazardous substances are the greater of the 20 times the GSI criterion or the GSI soil-water partition values using the GSI criteria developed with the procedure described in this footnote. A spreadsheet that may be used to calculate GSI and GSI protection criteria for (G)-footnoted hazardous substances is available on the Department of Environment, Great Lakes, and Energy (EGLE) internet web site. A hardness value of 47.5 CaCO<sub>3</sub>/L and pH of 7, derived from the Michigan Department of Environmental Quality Draft Site Inspection Report for Lake Linden Operations dated 3/29/13, was used in the footnote G calculation spreadsheet.

(H) = Valence-specific chromium data (Cr III and Cr VI) shall be compared to the corresponding valence-specific cleanup criteria. If both Cr III and Cr VI are present in groundwater, the total concentration of both cannot exceed the drinking water criterion of 100 ug/L. If analytical data are provided for total chromium only, they shall be compared to the cleanup criteria for Cr VI. Cr III soil cleanup criterion for protection of drinking water can only be used at sites where groundwater is prevented from being used as a public water supply, currently and in the future, through an approved land or resource use restriction.

(HH) = The residential criterion for sodium is 230,000 ug/l in accordance with the Sodium Advisory Council recommendation and revised Groundwater Discharge Standards.

(I) = Hazardous substance may exhibit the characteristic of ignitability as defined in 40 C.F.R. §261.21 (revised as of July 1, 2001), which is adopted by reference in these rules and is available for inspection at EGLE, 525 West Allegan Street, Lansing, Michigan. Copies of the regulation may be purchased, at a cost as of the time of adoption of these rules of \$45, from the Superintendent of documents, Government Printing Office, Washington, DC 20401 (stock number 869-044-00155-1), or from the EGLE, Remediation and Redevelopment Division (RRD), 525 West Allegan Street, Lansing, Michigan 48933, at cost.

(J) = Hazardous substance may be present in several isomer forms. Isomer-specific concentrations shall be added together for comparison to criteria.

(L) = Criteria for lead are derived using a biologically based model, as allowed for under Section 20120a(9) of the NREPA, and are not calculated using the algorithms and assumptions specified in pathway-specific rules. The generic residential drinking water criterion of 4 ug/L is linked to the generic residential soil direct contact criterion of 400 mg/kg. A higher concentration in the drinking water, up to the state action level of 15 ug/L, may be allowed as a site-specific remedy and still allow for drinking water use, under Section 20120a(2) and 20120b of the NREPA if soil concentrations are appropriately lower than 400 mg/kg. If a site-specific criterion is approved based on this subdivision, a notice shall be filed on the deed for all property where the groundwater concentrations will exceed 4 ug/L to provide notice of the potential for unacceptable risk if soil or groundwater concentrations increase.

Acceptable combinations of site-specific soil and drinking water concentrations are presented in a table available on the Department of Environment, Great Lakes, and Energy (EGLE) internet web site (See R 299.49 Footnotes for generic cleanup criteria tables for additional information).

(M) = Calculated criterion is below the analytical target detection limit, therefore, the criterion defaults to the target detection limit.

(Q) = Criteria for carcinogenic polycyclic aromatic hydrocarbons were developed using relative potential potencies to benzo(a)pyrene.

(S) = Criterion defaults to the hazardous substance-specific water solubility limit.

(T) = Refer to the federal Toxic Substances Control Act (TSCA), 40 C.F.R. §761, Subpart D and 40 C.F.R. §761, Subpart G, to determine the applicability of TSCA cleanup standards. Subpart D and Subpart G of 40 C.F.R. §761 (July 1, 2001) are adopted by reference in these rules and are available for inspection at the EGLE, 525 West Allegan Street, Lansing, Michigan. Copies of the regulations may be purchased, at a cost as of the time of adoption of these rules of \$55, from the Superintendent of Documents, Government Printing Office, Washington, DC 20401, or from the EGLE, RRD, 525 West Allegan Street, Lansing, Michigan 48933, at cost. Alternatives to compliance with the TSCA standards listed below are possible under 40 C.F.R. §761 Subpart D. New releases may be subject to the standards identified in 40 C.F.R. §761, Subpart G. Use Part 201 soil direct contact cleanup criteria in the published table if TSCA standards are not applicable.

(X) = The GSI criterion shown in the generic cleanup criteria tables is not protective for surface water that is used as a drinking water source. (See R 299.49 Footnotes for generic cleanup criteria tables for additional information.)

(Z) = Mercury is typically measured as total mercury. The generic cleanup criteria, however, are based on data for different species of mercury. Specifically, data for elemental mercury, chemical abstract service (CAS) number 7439976, serve as the basis for the soil volatilization to indoor air criteria, groundwater volatilization to indoor air, and soil inhalation criteria. Data for methyl mercury, CAS number 22967926, serve as the basis for the GSI criterion; and data for mercuric chloride, CAS number 7487947, serve as the basis for the drinking water, groundwater contact, soil direct contact, and the groundwater protection criteria. Comparison to criteria shall be based on species-specific analytical data only if sufficient facility characterization has been conducted to rule out the presence of other species of mercury.

MSSL Footnotes:

GW = The calculated value for a hazardous substance based upon shallow groundwater is considered protective when it is greater than the calculated value for groundwater.

J = Hazardous substance may be present in several isomer forms. Isomer-specific concentrations must be added together for comparison to screening level.

JT = Hazardous substance may be present in several isomer forms. Screening levels may be used for the individual isomer provided that it is the sole isomer detected; however, when multiple isomers are detected in a medium, the isomer-specific concentrations must be added together and compared to the most restrictive screening level of the detected isomers.

Laboratory Footnotes:

U = Analyte analyzed for but not detected above the reported sample reporting limit.

**TABLE 12-3**  
**Summary of Groundwater Analytical Results**  
**Area M**  
**Quincy Mining Company Portage Operations Area**  
**Abandoned Mining Wastes - Torch Lake Non-Superfund Site**

|                                                                                                         | Part 201 Generic Cleanup Criteria Evaluated                                          | Exceedance |
|---------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|------------|
| <b>EGLE Part 201 Generic Cleanup Criteria<br/>(December 2020)</b>                                       | [1] Residential Drinking Water Criteria                                              | YES        |
|                                                                                                         | [2] Nonresidential Drinking Water Criteria                                           | YES        |
|                                                                                                         | [3] Groundwater Surface Water Interface Criteria                                     | YES        |
|                                                                                                         | [4] Residential Groundwater Volatilization to Indoor Air Inhalation Criteria         | NO         |
|                                                                                                         | [5] Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria      | NO         |
|                                                                                                         | [6] Water Solubility                                                                 | NO         |
|                                                                                                         | [7] Flammability and Explosivity Screening                                           | NO         |
| <b>Media-Specific Volatilization to Indoor Air<br/>Interim Action Screening Levels<br/>(March 2021)</b> | [8] Shallow Groundwater Residential Media-Specific Screening Level (MSSL)            | NO         |
|                                                                                                         | [9] Shallow Groundwater Nonresidential MSSL                                          | NO         |
|                                                                                                         | [10] Groundwater Residential MSSL                                                    | NO         |
|                                                                                                         | [11] Groundwater Residential Time Sensitive Media-Specific Screening Level (TS MSSL) | NO         |
|                                                                                                         | [12] Groundwater Nonresidential MSSL                                                 | NO         |
|                                                                                                         | [13] Groundwater Nonresidential MSSL <sub>12</sub>                                   | NO         |
|                                                                                                         | [14] Groundwater Nonresidential TS MSSL <sub>12</sub>                                | NO         |

## 13. DETAILED FINDINGS – AREA O

This Section summarizes the results and subsequent findings for Area O within QMCP derived from implementation of the SAP. The narrative follows the systematic investigative approach outlined in **Section 3**, while providing specific details about the potential human health and ecological risks associated with the historical mining operations in the subarea of QMCP.

### 13.1 SITE INSPECTION AND INVESTIGATION RESULTS

The implementation of the site inspection and investigation activities provided critical lines of evidence that link the historical documentation and the current environmental conditions in and around the Portage Canal. The following subsections present the findings of the inspection and investigation activities and provide correlation of mining era operations and their potential impacts on the nearshore and offshore environment of the Portage Canal.

#### 13.1.1 Site Inspection

The site inspection at each subarea included the inventory and locating of historical structures and similar surficial artifacts associated with the former industrial operations in the area. Each subarea was also inspected for potential physical and health hazards that were documented, photographed, and located with a GPS unit. The inventoried hazards were then qualitatively assessed for potential human health and environmental risks to determine if analytical sampling was warranted during the targeted inspection phase of the work.

On September 27, 2018, MSG field team personnel performed reconnaissance activities at Area O. In the cases where access was not requested based on historic operational and investigative findings, property conditions were evaluated from a neighboring property or public right of way where access was permitted. Access to Area O was not requested based on historic operational and investigative findings.

Therefore, the property parcel known as Horner Flooring totaling approximately 30 acres was visually inspected and observations were recorded from the public road right of way. The following provides a summary of the findings associated with the reconnaissance activities. A copy of the reconnaissance log is provided in **Appendix C, Site Inspections – Reconnaissance Logs, Targeted Inspections & Physical Hazards Inventory**.

##### 13.1.1.1 Reconnaissance

The reconnaissance activities did not identify potentially abandoned containers or other environmental concerns. The qualitative assessment of the reconnaissance findings in Area O did not warrant the performance of limited targeted inspection activities.

#### 13.1.2 Site Investigation

The SI in the QMCP was developed based on a variety of data and information as outlined in **Section 3**. In addition to the historical accounts and documentation, current land use and potential exposure pathways were also taken into consideration when selecting sampling locations. Due to this, along with findings associated with previous investigations, SI activities were not conducted in Area O. The following subsections present the outcomes of historic investigative activities completed in Area O by summarizing the laboratory analytical results and characterizing their impacts on the environmental media in which they were detected.

#### 13.1.2.1 Historic Investigations

Intrusive investigation activities in the QMCP were generally guided by the findings of historical research and field observations. Following a review of available historic Sanborn Maps and other resources, historic land use and/or operations within Area O included Dollar Bay Land and Improvement Co., Dollar Bay Lumber Company, Dollar Bay Lumber Co. Saw Mill & Lumber Yard, and Horner Flooring Co. Wood Flooring Mill.

Potential organic and inorganic COCs in the study area were generally understood, particularly in areas where previous investigations and remedial actions had been completed. However, only limited data related to the COCs on the property was available. Previous investigative activities did not include soil sampling and did not fully characterize contaminants in groundwater.

A detailed summary of groundwater analytical results collected from Area O is provided in **Table 13-1, Summary of Groundwater Analytical Results (Area O)**. Historic groundwater analytical results are depicted on **Figure 13-1, Groundwater Analytical Results (Area O)**.

### 13.2 NATURE AND EXTENT OF CONTAMINATION

Utilizing the established regulatory criteria presented in **Section 4** for various land use categories and exposure pathways, the laboratory analytical results summarized in the preceding section for Area O were reviewed and compared to EGLE Cleanup Criteria Requirements for Response Activity as applicable for the sampled environmental media.

#### 13.2.1 Comprehensive Exposure Assessment

The comparison was completed to determine which ecological and human exposure pathways, risks, and conditions are relevant at Area O. Due to the limited nature of the available analytical data which only included analysis for pentachlorophenol in five groundwater samples in 1994, potentially relevant exposure pathways could not be fully evaluated.

As discussed in **Section 4.2.5**, EGLE drinking water and groundwater/surface water pathway criteria exceedances for metals were excluded from the soil and groundwater evaluation. The rationale for this exclusion is twofold:

- The Project investigation and anticipated response actions are being undertaken pursuant to Part 201 of NREPA, being PA 451 of 1994, as amended. The concentrations of metals in excess of the EGLE drinking water and groundwater/surface water pathway criteria are ubiquitous in the study area and are predominantly the result of the presence of stamp sands. Stamp sands are not defined as a hazardous substance nor are subject to regulation under Part 201 unless the property otherwise contains hazardous substances in excess of concentrations that satisfy the cleanup criteria for unrestricted residential use; and,
- The study area is part of OU 2 for which the EPA ROD remedy called for No Action. The EPA's ROD OU 2 includes groundwater, surface water, submerged tailings and sediments in Torch Lake, Portage Lake, the Portage Canal, and other area water bodies. Note that EPA's No Action determination relies on the following to mitigate the effects of stamp sand to the extent practicable:
  - The reduction of stamp sand loading to surface water bodies expected as a result of the remedial action taken at OU 1 and OU 3.
  - Ongoing natural sedimentation and detoxification.

- Institutional programs and practices controlling potential future exposure to site-affected drinking water which were intended to be administered at the county and state level.
- The long-term monitoring and the five-year review process monitoring requirements of the remedy selected for OU 1 and OU 3 under the 1992 ROD.

Note that metals criteria for other relevant pathways, and cyanide and organic contaminants for all pathways were included in the evaluation, if data was available.

Furthermore, as discussed in **Section 4.2.5**, EGLE's MSSLs were not included in the exposure pathway assessment due to unknown anticipated future land use and conditions. The MSSLs were considered for screening and delineation purposes only.

### 13.2.1.1 Groundwater Exposure Pathway Assessment

Groundwater analytical results from Area O did not detect COC concentrations in groundwater that were at or above concentrations that trigger a "Facility" designation as defined in Section 20101(1)(s) of the NREPA. However, as noted above, the only COC analyzed was pentachlorophenol. The following table provides a summary of the aforementioned sample locations with respect to the total number of samples and how they compare to the applicable EGLE Cleanup Criteria for Response Activity under both Residential and Nonresidential exposure scenarios.

| Groundwater Analytical Result Summary Table                          | Analytical Summary      |                                   |                   | Cleanup Criteria Requirements for Response Activity – Residential and Nonresidential |                                        |                                              |                                                                          |                                                                             |                  |                                               |
|----------------------------------------------------------------------|-------------------------|-----------------------------------|-------------------|--------------------------------------------------------------------------------------|----------------------------------------|----------------------------------------------|--------------------------------------------------------------------------|-----------------------------------------------------------------------------|------------------|-----------------------------------------------|
|                                                                      | Total Number of Samples | Total Number of Detected Analytes | Total Exceedances | Residential Drinking Water Criteria                                                  | Nonresidential Drinking Water Criteria | Groundwater Surface Water Interface Criteria | Residential Groundwater Volatilization to Indoor Air Inhalation Criteria | Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria | Water Solubility | Flammability and Explosivity Screening Levels |
| Inorganics                                                           | 0                       | 0                                 | 0                 | NA*                                                                                  | NA*                                    | NA*                                          | 0                                                                        | 0                                                                           | 0                | 0                                             |
| Cyanide                                                              | 0                       | 0                                 | 0                 | 0                                                                                    | 0                                      | 0                                            | 0                                                                        | 0                                                                           | 0                | 0                                             |
| VOCs                                                                 | 0                       | 0                                 | 0                 | 0                                                                                    | 0                                      | 0                                            | 0                                                                        | 0                                                                           | 0                | 0                                             |
| SVOCs                                                                | 5                       | 1                                 | 0                 | 0                                                                                    | 0                                      | 0                                            | 0                                                                        | 0                                                                           | 0                | 0                                             |
| Total PCBs                                                           | 0                       | 0                                 | 0                 | 0                                                                                    | 0                                      | 0                                            | 0                                                                        | 0                                                                           | 0                | 0                                             |
| Pesticides                                                           | 0                       | 0                                 | 0                 | 0                                                                                    | 0                                      | 0                                            | 0                                                                        | 0                                                                           | 0                | 0                                             |
| COCs exceeding applicable regulatory criteria in one or more samples |                         |                                   |                   | Not applicable                                                                       |                                        |                                              |                                                                          |                                                                             |                  |                                               |

NA\* = The EGLE drinking water and groundwater/surface water interface pathway criteria exceedances for metals are excluded from the groundwater evaluation as explained in Section 4.2.5.

\*Denotes total number of specific instances of an analyte being detected or exceeding criteria, can be multiple within one sample location.

*\*\*Denotes total number of samples exceeding criteria, cannot be multiple within one sample location.*

*Total exceedance column does not include MSSSLs or non-applicable criteria (DWC and GSIC for metals).*

#### 13.2.1.2 Groundwater Extent of Contamination

Groundwater analytical results did not exceed criteria in either residential or nonresidential exposure scenarios at Area O; however, limited historical analytical data related only to pentachlorophenol was available for evaluation. Additional information related to sampling was not available.

The groundwater sampling locations were established in a zone roughly 0 ft to 850 ft from the shoreline of Dollar Bay; however, depths were not available.

The potential risks associated with groundwater as a drinking water source as well as its connectivity to nearby surface water bodies should be a consideration if additional investigations are conducted related to potential contamination in Area O as the potential for exposure has not been fully investigated or evaluated.

### 13.3 CONCLUSIONS AND RECOMMENDATIONS

The analytical results and interpretation summarized in the preceding subsections document potential human health and ecological risks that are present in Area O. The following subsections provide a synopsis of these findings and a recommended path forward in Area O.

#### 13.3.1 Conclusions

Environmental impacts to soil and/or groundwater, if any, in the Area O have not been fully investigated or characterized. Based on available analytical data, specific sources of any potential contaminants may not be fully understood. However, historical research related to the operations provided substantive evidence for assessing specific operational areas and selecting target analytes anticipated to be present within the study area.

The historic analytical results summarized above do not provide sufficient analytical data and lines of evidence to conclude that the study area is a "Facility" as defined in Section 20101(1)(s) of the NREPA.

In addition to the evaluation of analytical results from Area O, the following provides a summary of findings derived from the assessment of Area O with respect to the goals and objectives for the Project:

- Terrestrial sources of contamination are not known to be present in the form of inorganic or organic COCs in the study area. Due to the nature of the analytical data, the extent of any potential contamination in Area O has not been fully defined or addressed.

#### 13.3.2 Recommendations

The conclusions outlined in the preceding subsection establish that Area O is not a Part 201 Facility based on existing available data. Section 20107a of Part 201 of NREPA describes the duties of owners or operators of a Facility, regardless of their liability, including: prevent unacceptable exposures, prevent exacerbation, and take reasonable precautions against the foreseeable actions of third parties. Some exceptions may apply; in any case, owners and operators of contaminated properties should become familiar with Section 20107a and the associated Rules.

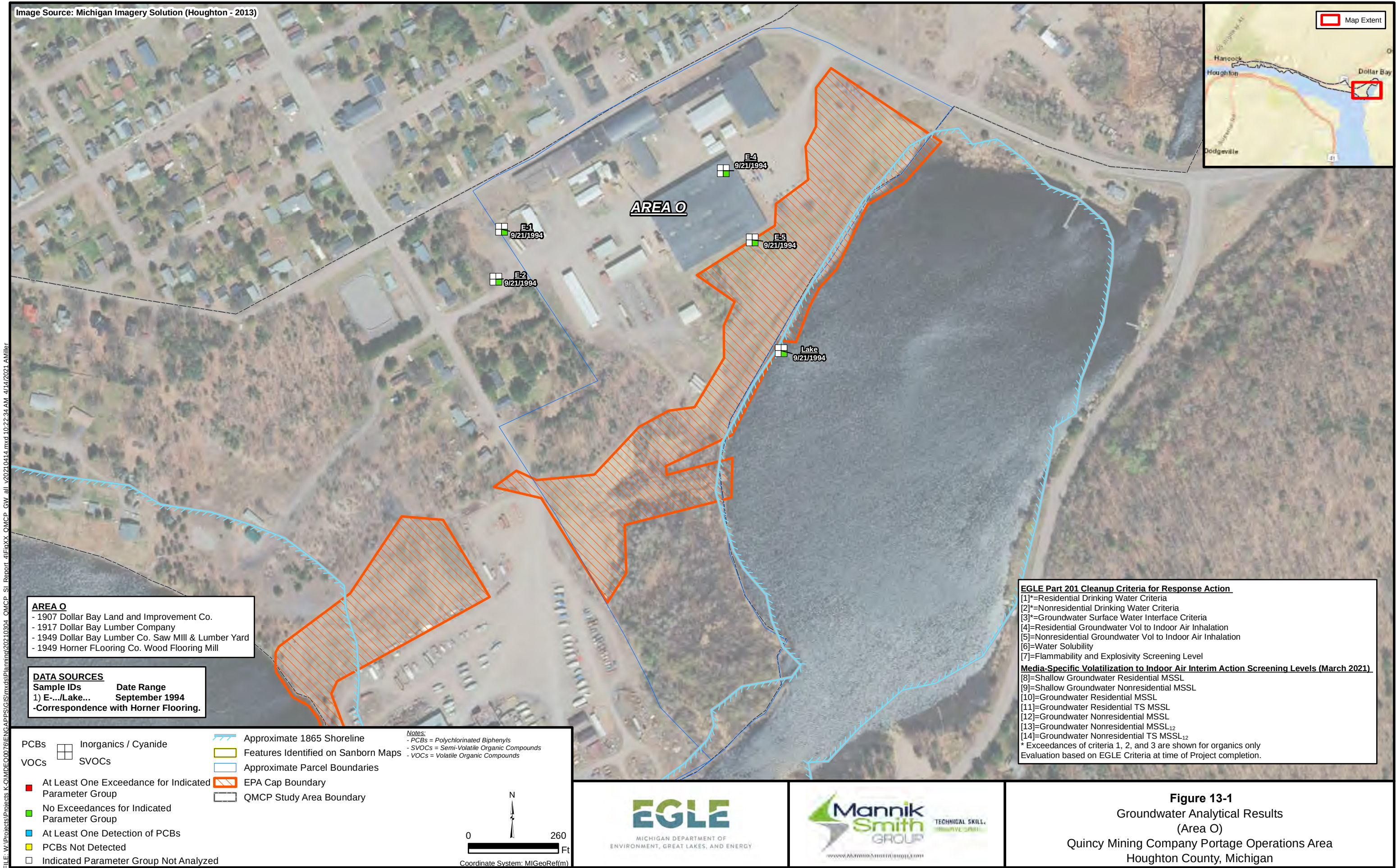


## FIGURES

### DETAILED FINDINGS REPORT – AREA 0







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## TABLES

### DETAILED FINDINGS REPORT – AREA 0



TABLE 13-1  
Summary of Groundwater Analytical Results  
Area O  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code                      |            | EGLE Part 201 Generic Cleanup Criteria           |                                                     |                                                              |                                                                                                |                                                                                                   |                         | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                                         |                                            |                                               |                                               |                                                             | Area O    |         |           |         |           |         |           |         |           |         |
|------------------------------------|------------|--------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------|-----------------------------------------------|-----------------------------------------------|-------------------------------------------------------------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|
| Station Name                       | CAS Number | [1]<br>Residential<br>Drinking Water<br>Criteria | [2]<br>Nonresidential<br>Drinking Water<br>Criteria | [3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [4]<br>Residential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [5]<br>Nonresidential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [6]<br>Water Solubility | [8]<br>Shallow<br>Groundwater<br>Residential<br>MSSL                        | [9]<br>Shallow<br>Groundwater<br>Nonresidential<br>MSSL | [10]<br>Groundwater<br>Residential<br>MSSL | [11]<br>Groundwater<br>Residential TS<br>MSSL | [12]<br>Groundwater<br>Nonresidential<br>MSSL | [13]<br>Groundwater<br>Nonresidential<br>MSSL <sub>12</sub> | E-1       |         | E-2       |         | E-4       |         | E-5       |         | Lake      |         |
| Field Sample ID                    |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | E-1       |         | E-2       |         | E-4       |         | E-5       |         | Lake      |         |
| Sample Date                        |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 9/21/1994 |         | 9/21/1994 |         | 9/21/1994 |         | 9/21/1994 |         | 9/21/1994 |         |
| Sample Interval (bgs)              |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | --        |         | --        |         | --        |         | --        |         | --        |         |
|                                    |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | Result    | Exceeds | Result    | Exceeds | Result    | Exceeds | Result    | Exceeds | Result    | Exceeds |
| Inorganics - Metals (ug/l)         |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |           |         |           |         |           |         |           |         |           |         |
| ARSENIC                            | 7440-38-2  | 10 (A)                                           | 10 (A)                                              | 10                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| BARIUM                             | 7440-39-3  | 2,000 (A,B)                                      | 2,000 (A,B)                                         | 200 (B,G)                                                    | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| CADMIUM                            | 7440-43-9  | 5.0 (A,B)                                        | 5.0 (A,B)                                           | 1.3 (B,G,X)                                                  | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| CALCIUM                            | 7440-70-2  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| CHROMIUM                           | 7440-47-3  | 100 (A,B,H)                                      | 100 (A,B,H)                                         | 40 (B,G,H,X)                                                 | NA                                                                                             | NLV                                                                                               | NLV                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| COPPER                             | 7440-50-8  | 4.0 (B,E)                                        | 4.0 (B,E)                                           | 14 (B,G)                                                     | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| LEAD                               | 7439-92-1  | 4.0 (B,L)                                        | 4.0 (B,L)                                           | 14 (B,G,X)                                                   | NVL                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| MAGNESIUM                          | 7439-95-4  | 400,000 (B)                                      | 1,100,000 (B)                                       | NA                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| MANGANESE                          | 7439-96-5  | 50 (B,E)                                         | 50 (B,E)                                            | 1,000 (B,G,X)                                                | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| MERCURY                            | 7439-97-6  | 2.0 (A,B,Z)                                      | 2.0 (A,B,Z)                                         | 0.0013 (B,Z)                                                 | 56 (B,S,Z)                                                                                     | 56 (B,S,Z)                                                                                        | 56 (B,Z)                | 0.088                                                                       | 0.14                                                    | 1.4                                        | 4.3                                           | 4.3                                           | 8.5                                                         | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| POTASSIUM                          | 7440-09-7  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| SELENIUM                           | 7782-49-2  | 50 (A,B)                                         | 50 (A,B)                                            | 5 (B)                                                        | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| SILVER                             | 7440-22-4  | 34 (B)                                           | 98 (B)                                              | 0.2 (B,M)                                                    | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| SODIUM                             | 7440-23-5  | 230,000 (HH)                                     | 350,000                                             | NA                                                           | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| STRONTIUM                          | 7440-24-6  | 4,600 (B)                                        | 13,000 (B)                                          | 21,000 (B)                                                   | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| ZINC                               | 7440-66-6  | 2,400 (B)                                        | 5,000 (B,E)                                         | 63 (B,G)                                                     | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| Organics - PCBs as Aroclors (ug/l) |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |           |         |           |         |           |         |           |         |           |         |
| TOTAL PCBs                         | 1336-36-6  | 0.5 (A,J,T)                                      | 0.5 (A,J,T)                                         | 0.2 (J,M,T)                                                  | 45 (J,S,T)                                                                                     | 45 (J,S,T)                                                                                        | 44.7 (J,T)              | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| Organics - SVOCs (ug/l)            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |           |         |           |         |           |         |           |         |           |         |
| 2-METHYLNAPHTHALENE (SVOC)         | 91-57-6S   | 260                                              | 750                                                 | 19                                                           | 25,000 (S)                                                                                     | 25,000 (S)                                                                                        | 24,600                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| ACENAPHTHENE                       | 83-32-9    | 1,300                                            | 3,800                                               | 38                                                           | 4,200 (S)                                                                                      | 4,200 (S)                                                                                         | 4,240                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| ACENAPHTHYLENE                     | 208-96-8   | 52                                               | 150                                                 | ID                                                           | 3,900 (S)                                                                                      | 3,900 (S)                                                                                         | 3,930                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| ANTHRACENE                         | 120-12-7   | 43 (S)                                           | 43 (S)                                              | ID                                                           | 43 (S)                                                                                         | 43 (S)                                                                                            | 43.4                    | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| BENZO(A)ANTHRACENE                 | 56-55-3    | 2.1 (Q)                                          | 8.5 (Q)                                             | ID                                                           | NLV                                                                                            | NLV                                                                                               | 9.4 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| BENZO(A)PYRENE                     | 50-32-8    | 5.0 (A,Q)                                        | 5.0 (A,Q)                                           | ID                                                           | NLV                                                                                            | NLV                                                                                               | 1.62 (Q)                | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| BENZO(B)FLUORANTHENE               | 205-99-2   | 1.5 (Q,S,AA)                                     | 1.5 (Q,S,AA)                                        | ID                                                           | ID                                                                                             | ID                                                                                                | 1.5 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| BENZO(G,H,I)PERYLENE               | 191-24-2   | 1.0 (M)                                          | 1.0 (M)                                             | ID                                                           | NLV                                                                                            | NLV                                                                                               | 0.26                    | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| BENZO(K)FLUORANTHENE               | 207-08-9   | 1.0 (M,Q)                                        | 1.0 (M,Q)                                           | NA                                                           | NLV                                                                                            | NLV                                                                                               | 0.8 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| CHRYSENE                           | 218-01-9   | 1.6 (Q,S)                                        | 1.6 (Q,S)                                           | ID                                                           | ID                                                                                             | ID                                                                                                | 1.6 (Q)                 | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| FLUORANTHENE                       | 206-44-0   | 210 (S)                                          | 210 (S)                                             | 1.6                                                          | 210 (S)                                                                                        | 210 (S)                                                                                           | 206                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| FLUORENE                           | 86-73-7    | 880                                              | 2,000 (S)                                           | 12                                                           | 2,000 (S)                                                                                      | 2,000 (S)                                                                                         | 1,980                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| INDENO(1,2,3-CD)PYRENE             | 193-39-5   | 2.0 (M,Q)                                        | 2.0 (M,Q)                                           | ID                                                           | NLV                                                                                            | NLV                                                                                               | 0.022 (Q)               | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| NAPHTHALENE (SVOC)                 | 91-20-3S   | 520                                              | 1,500                                               | 11                                                           | 31,000 (S)                                                                                     | 31,000 (S)                                                                                        | 31,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| PENTACHLOROPHENOL                  | 87-86-5    | 1.0 (A)                                          | 1.0 (A)                                             | 1.8 (G,X)                                                    | NLV                                                                                            | NLV                                                                                               | 1.85E+06                | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | <0.04 U   | --      | <0.04 U   | --      | 0.05      | --      | <0.04 U   | --      | <0.04 U   | --      |
| PHENANTHRENE                       | 85-01-8    | 52                                               | 150                                                 | 2.0 (M)                                                      | 1,000 (S)                                                                                      | 1,000 (S)                                                                                         | 1,000                   | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| PYRENE                             | 129-00-0   | 140 (S)                                          | 140 (S)                                             | ID                                                           | 140 (S)                                                                                        | 140 (S)                                                                                           | 135                     | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 13-1  
Summary of Groundwater Analytical Results  
Area O  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code              |            | EGLE Part 201 Generic Cleanup Criteria           |                                                     |                                                              |                                                                                                |                                                                                                   |                         | Media-Specific Volatilization to Indoor Air Interim Action Screening Levels |                                                         |                                            |                                               |                                               |                                                             | Area O    |         |           |         |           |         |           |         |           |         |
|----------------------------|------------|--------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------|-----------------------------------------------|-----------------------------------------------|-------------------------------------------------------------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|
| Station Name               | CAS Number | [1]<br>Residential<br>Drinking Water<br>Criteria | [2]<br>Nonresidential<br>Drinking Water<br>Criteria | [3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [4]<br>Residential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [5]<br>Nonresidential<br>Groundwater<br>Volatilization to<br>Indoor Air<br>Inhalation<br>Criteria | [6]<br>Water Solubility | [8]<br>Shallow<br>Groundwater<br>Residential<br>MSSL                        | [9]<br>Shallow<br>Groundwater<br>Nonresidential<br>MSSL | [10]<br>Groundwater<br>Residential<br>MSSL | [11]<br>Groundwater<br>Residential TS<br>MSSL | [12]<br>Groundwater<br>Nonresidential<br>MSSL | [13]<br>Groundwater<br>Nonresidential<br>MSSL <sub>12</sub> | E-1       |         | E-2       |         | E-4       |         | E-5       |         | Lake      |         |
| Field Sample ID            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | E-1       |         | E-2       |         | E-4       |         | E-5       |         | Lake      |         |
| Sample Date                |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | 9/21/1994 |         | 9/21/1994 |         | 9/21/1994 |         | 9/21/1994 |         | 9/21/1994 |         |
| Sample Interval (bgs)      |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | --        |         | --        |         | --        |         | --        |         | --        |         |
|                            |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             | Result    | Exceeds | Result    | Exceeds | Result    | Exceeds | Result    | Exceeds | Result    | Exceeds |
| Organics - VOCs (ug/l)     |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |           |         |           |         |           |         |           |         |           |         |
| 1,1,1-TRICHLOROETHANE      | 71-55-6    | 200 (A)                                          | 200 (A)                                             | 89                                                           | 660,000                                                                                        | 1,300,000 (S)                                                                                     | 1,330,000               | 180                                                                         | 500                                                     | 8,600                                      | 8,600                                         | 24,000                                        | 24,000                                                      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| 1,2,3-TRIMETHYLBENZENE     | 526-73-8   | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | 43 (JT)                                                                     | 67 (JT)                                                 | 800 (JT)                                   | 2,400 (JT)                                    | 2,300 (JT)                                    | 4,700 (JT)                                                  | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| 1,2,4-TRIMETHYLBENZENE     | 95-63-6    | 63 (E,I)                                         | 63 (E,I)                                            | 17 (I)                                                       | 56,000 (I,S)                                                                                   | 56,000 (I,S)                                                                                      | 55,890 (I)              | 25 (JT)                                                                     | 44 (JT)                                                 | 440 (JT)                                   | 1,300 (JT)                                    | 1,300 (JT)                                    | 2,600 (JT)                                                  | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| 1,3,5-TRIMETHYLBENZENE     | 108-67-8   | 72 (E,I)                                         | 72 (E,I)                                            | 45 (I)                                                       | 61,000 (I,S)                                                                                   | 61,000 (I,S)                                                                                      | 61,150 (I)              | 18 (JT)                                                                     | 30 (JT)                                                 | 310 (JT)                                   | 940 (JT)                                      | 920 (JT)                                      | 1,800 (JT)                                                  | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| 2-METHYLNAPHTHALENE (VOC)  | 91-57-6V   | 260                                              | 750                                                 | 19                                                           | 25,000 (S)                                                                                     | 25,000 (S)                                                                                        | 24,600                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| ACETONE                    | 67-64-1    | 730 (I)                                          | 2100 (I)                                            | 1700 (I)                                                     | 1.0E+9 (D,I,S)                                                                                 | 1.0E+9 (D,I,S)                                                                                    | 1.0E+9 (I)              | 50,000                                                                      | 62,000                                                  | 1.20E+07                                   | 1.20E+07                                      | 2.50E+07                                      | 2.50E+07                                                    | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| BENZENE                    | 71-43-2    | 5.0 (A,I)                                        | 5.0 (A,I)                                           | 12 (I,X)                                                     | 5,600 (I)                                                                                      | 35,000 (I)                                                                                        | 1,750,000 (I)           | 1                                                                           | 2.7                                                     | 14                                         | 82                                            | 66                                            | 130                                                         | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| CYCLOHEXANE                | 110-82-7   | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| ETHYLBENZENE               | 100-41-4   | 74 (E,I)                                         | 74 (E,I)                                            | 18 (I)                                                       | 110,000 (I)                                                                                    | 170,000 (I,S)                                                                                     | 169,000 (I)             | 2.8                                                                         | 7.6                                                     | 45                                         | 450                                           | 210                                           | 420                                                         | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| HEXANE                     | 110-54-3   | 3,000                                            | 8,600                                               | NA                                                           | 12,000 (S)                                                                                     | 12,000 (S)                                                                                        | 12,000                  | 29                                                                          | 85                                                      | 29 (GW)                                    | 33                                            | 85 (GW)                                       | 170 (GW)                                                    | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| ISOPROPYLBENZENE           | 98-82-8    | 800                                              | 2,300                                               | 28                                                           | 56,000 (S)                                                                                     | 56,000 (S)                                                                                        | 56,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| M,P-XYLENE                 | 1330-20-7  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| NAPHTHALENE (VOC)          | 91-20-3V   | 520                                              | 1,500                                               | 11                                                           | 31,000 (S)                                                                                     | 31,000 (S)                                                                                        | 31,000                  | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| N-PROPYLBENZENE            | 103-65-1   | 80 (I)                                           | 230 (I)                                             | ID                                                           | ID                                                                                             | ID                                                                                                | NA                      | 43                                                                          | 83                                                      | 4100                                       | 12000                                         | 8100                                          | 8100                                                        | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| O-XYLENE                   | 95-47-6    | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| TETRACHLOROETHYLENE        | 127-18-4   | 5.0 (A)                                          | 5.0 (A)                                             | 11 (X)                                                       | 25,000                                                                                         | 170,000                                                                                           | 200,000                 | 1.5                                                                         | 3                                                       | 96                                         | 96                                            | 190                                           | 380                                                         | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| TOLUENE                    | 108-88-3   | 790 (E,I)                                        | 790 (E,I)                                           | 270 (I)                                                      | 530,000 (I,S)                                                                                  | 530,000 (I,S)                                                                                     | 526,000 (I)             | 300                                                                         | 570                                                     | 23,000                                     | 33,000                                        | 66,000                                        | 66,000                                                      | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| TRICHLOROETHYLENE          | 79-01-6    | 5.0 (A)                                          | 5.0 (A)                                             | 29 (X)                                                       | 2,200                                                                                          | 4,900                                                                                             | 1,100,000               | 0.073 (M)                                                                   | 0.14 (M)                                                | 6.1                                        | 18                                            | 12                                            | 24                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| XYLENE - TOTAL             | 1330-20-7  | 280 (E,I)                                        | 280 (E,I)                                           | 49 (I)                                                       | 190,000 (I,S)                                                                                  | 190,000 (I,S)                                                                                     | 186,000 (I)             | 75 (J)                                                                      | 120 (J)                                                 | 1,200 (J)                                  | 3,600 (J)                                     | 3,500 (J)                                     | 7,100 (J)                                                   | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| Other                      |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |           |         |           |         |           |         |           |         |           |         |
| CHLORIDE (mg/l)            | 16887-00-6 | 250,000 (E)                                      | 250,000 (E)                                         | 50 (FF)                                                      | NLV                                                                                            | NLV                                                                                               | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| NITROGEN (mg/l)            | 7727-37-9  | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| HYDROCARBONS, TOTAL (mg/l) | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| Water Quality Parameters   |            |                                                  |                                                     |                                                              |                                                                                                |                                                                                                   |                         |                                                                             |                                                         |                                            |                                               |                                               |                                                             |           |         |           |         |           |         |           |         |           |         |
| TEMPERATURE (°C)           | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| CONDUCTIVITY (mS/cm)       | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| DISSOLVED OXYGEN (%)       | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| pH                         | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |
| TURBIDITY (nTu)            | --         | NA                                               | NA                                                  | NA                                                           | NA                                                                                             | NA                                                                                                | NA                      | NA                                                                          | NA                                                      | NA                                         | NA                                            | NA                                            | NA                                                          | NM        | --      | NM        | --      | NM        | --      | NM        | --      | NM        | --      |

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 13-1  
Summary of Groundwater Analytical Results  
Area O  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Groundwater Table Footnotes:

- EGLE Part 201 residential and non-residential generic cleanup criteria and screening levels criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Release Date: December 30, 2013. Updated December 21, 2020.

- Only detected analytes are listed - Gray rows indicate requested analyses. If no analytes are listed below a gray row then all analytes of that group were either not analyzed or not detected.

- **Bold** values are concentrations detected above the laboratory reporting limit.

- **Bold/Shaded** cells indicate analyte concentration exceeded applicable criteria. EGLE Part 201 criteria exceeded is indicated by the footnote in [brackets] following the result value and defined below:

|                                                                                   |                                                    |
|-----------------------------------------------------------------------------------|----------------------------------------------------|
| [1] - Residential Drinking Water Criteria                                         | [8] Shallow Groundwater Residential MSSL           |
| [2] - Nonresidential Drinking Water Criteria                                      | [9] Shallow Groundwater Nonresidential MSSL        |
| [3] - Groundwater Surface Water Interface Criteria                                | [10] Groundwater Residential MSSL                  |
| [4] - Water Solubility                                                            | [11] Groundwater Residential TS MSSL               |
| [5] - Residential Groundwater Volatilization to Indoor Air Inhalation Criteria    | [12] Groundwater Nonresidential MSSL               |
| [6] - Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria | [13] Groundwater Nonresidential MSSL <sub>12</sub> |
| [7] - Flammability and Explosivity Screening Level                                | [14] Groundwater Nonresidential TS MSSL            |

Evaluation based on EGLE Criteria at time of Project completion.

|                                       |                                                                                                     |
|---------------------------------------|-----------------------------------------------------------------------------------------------------|
| -- = No Exceedances                   | mg/l = Milligrams per liter                                                                         |
| ND = Not Detected                     | °C = Degrees Celsius                                                                                |
| NM = Not Measured                     | mS/cm = MilliSiemens per centimeter                                                                 |
| bgs = Below ground surface            | % = Percentage                                                                                      |
| ft = Feet                             | nTu = Nephelometric Turbidity Unit                                                                  |
| PCBs = Polychlorinated biphenyls      | pH = pH acid-base scale                                                                             |
| SVOC = Semi-volatile organic compound | MSSL = Media-Specific Volatilization to Indoor Air Interim Action Screening Level                   |
| VOC = Volatile organic compound       | TS MSSL = Time Sensitive Media-Specific Volatilization to Indoor Air Interim Action Screening Level |

ug/l = Micrograms per liter

Groundwater Table Footnotes:

ID = Insufficient data to develop criterion.

NA = A criterion or value is not available

NLV = Hazardous substance is not likely to volatilize under most conditions.

(A) = Criterion is the state of Michigan drinking water standard established pursuant to Section 5 of 1976 PA 399, MCL 325.1005.

(AA) = Use 10,000 ug/l where groundwater enters a structure through the use of a water well, sump or other device. Use 28,000 ug/l for all other uses.

(B) = Background, as defined in R 299.1(b), may be substituted if higher than the calculated cleanup criterion. Background levels may be less than criteria for some inorganic compounds.

(D) = Calculated criterion exceeds 100 percent, hence it is reduced to 100 percent or 1.0E+9 parts per billion (ppb).

(E) = Criterion is the aesthetic drinking water value, as required by Section 20120a(5) of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA). A notice of aesthetic impact may be employed as an institutional control mechanism if groundwater concentrations exceed the aesthetic drinking water criterion, but do not exceed the applicable health-based drinking water value provided in a table available on the Department of Environment, Great Lakes, and Energy (EGLE) internet web site. (See R 299.49 Footnotes for generic cleanup criteria tables for additional information)

(FF) = The chloride GSI criterion shall be 125 mg/l when the discharge is to surface waters of the state designated as public water supply sources or 50 mg/l when the discharge is to the Great Lakes or connecting waters. Chloride GSI criteria shall not apply for surface waters of the state that are not designated as a public water supply source, however, the total dissolved solids criterion is applicable.

(G) = Groundwater surface water interface (GSI) criterion depends on the pH or water hardness, or both, of the receiving surface water. The final chronic value (FCV) for the protection of aquatic life shall be calculated based on the pH or hardness of the receiving surface water. Where water hardness exceeds 400 mg CaCO<sub>3</sub>/L, use 400 mg CaCO<sub>3</sub>/L for the FCV calculation. The FCV formula provides values in units of ug/L or ppb. The generic GSI criterion is the lesser of the calculated FCV, the wildlife value (WV), and the surface water human non-drinking water value (HNDV). The soil GSI protection criteria for these hazardous substances are the greater of the 20 times the GSI criterion or the GSI soil-water partition values using the GSI criteria developed with the procedure described in this footnote. A spreadsheet that may be used to calculate GSI and GSI protection criteria for (G)-footnoted hazardous substances is available on the Department of Environment, Great Lakes, and Energy (EGLE) internet web site. A hardness value of 47.5 CaCO<sub>3</sub>/L and pH of 7, derived from the Michigan Department of Environmental Quality Draft Site Inspection Report for Lake Linden Operations dated 3/29/13, was used in the footnote G calculation spreadsheet.

(H) = Valence-specific chromium data (Cr III and Cr VI) shall be compared to the corresponding valence-specific cleanup criteria. If both Cr III and Cr VI are present in groundwater, the total concentration of both cannot exceed the drinking water criterion of 100 ug/L. If analytical data are provided for total chromium only, they shall be compared to the cleanup criteria for Cr VI. Cr III soil cleanup criterion for protection of drinking water can only be used at sites where groundwater is prevented from being used as a public water supply, currently and in the future, through an approved land or resource use restriction.

(HH) = The residential criterion for sodium is 230,000 ug/l in accordance with the Sodium Advisory Council recommendation and revised Groundwater Discharge Standards.

(I) = Hazardous substance may exhibit the characteristic of ignitability as defined in 40 C.F.R. §261.21 (revised as of July 1, 2001), which is adopted by reference in these rules and is available for inspection at EGLE, 525 West Allegan Street, Lansing, Michigan. Copies of the regulation may be purchased, at a cost as of the time of adoption of these rules of \$45, from the Superintendent of documents, Government Printing Office, Washington, DC 20401 (stock number 869-044-00155-1), or from the EGLE, Remediation and Redevelopment Division (RRD), 525 West Allegan Street, Lansing, Michigan 48933, at cost.

(J) = Hazardous substance may be present in several isomer forms. Isomer-specific concentrations shall be added together for comparison to criteria.

(L) = Criteria for lead are derived using a biologically based model, as allowed for under Section 20120a(9) of the NREPA, and are not calculated using the algorithms and assumptions specified in pathway-specific rules. The generic residential drinking water criterion of 4 ug/L is linked to the generic residential soil direct contact criterion of 400 mg/kg. A higher concentration in the drinking water, up to the state action level of 15 ug/L, may be allowed as a site-specific remedy and still allow for drinking water use, under Section 20120a(2) and 20120b of the NREPA if soil concentrations are appropriately lower than 400 mg/kg. If a site-specific criterion is approved based on this subdivision, a notice shall be filed on the deed for all property where the groundwater concentrations will exceed 4 ug/L to provide notice of the potential for unacceptable risk if soil or groundwater concentrations increase.

Acceptable combinations of site-specific soil and drinking water concentrations are presented in a table available on the Department of Environment, Great Lakes, and Energy (EGLE) internet web site (See R 299.49 Footnotes for generic cleanup criteria tables for additional information).

(M) = Calculated criterion is below the analytical target detection limit, therefore, the criterion defaults to the target detection limit.

(Q) = Criteria for carcinogenic polycyclic aromatic hydrocarbons were developed using relative potential potencies to benzo(a)pyrene.

(S) = Criterion defaults to the hazardous substance-specific water solubility limit.

(T) = Refer to the federal Toxic Substances Control Act (TSCA), 40 C.F.R. §761, Subpart D and 40 C.F.R. §761, Subpart G, to determine the applicability of TSCA cleanup standards. Subpart D and Subpart G of 40 C.F.R. §761 (July 1, 2001) are adopted by reference in these rules and are available for inspection at the EGLE, 525 West Allegan Street, Lansing, Michigan. Copies of the regulations may be purchased, at a cost as of the time of adoption of these rules of \$55, from the Superintendent of Documents, Government Printing Office, Washington, DC 20401, or from the EGLE, RRD, 525 West Allegan Street, Lansing, Michigan 48933, at cost. Alternatives to compliance with the TSCA standards listed below are possible under 40 C.F.R. §761 Subpart D. New releases may be subject to the standards identified in 40 C.F.R. §761, Subpart G. Use Part 201 soil direct contact cleanup criteria in the published table if TSCA standards are not applicable.

(X) = The GSI criterion shown in the generic cleanup criteria tables is not protective for surface water that is used as a drinking water source. (See R 299.49 Footnotes for generic cleanup criteria tables for additional information.)

(Z) = Mercury is typically measured as total mercury. The generic cleanup criteria, however, are based on data for different species of mercury. Specifically, data for elemental mercury, chemical abstract service (CAS) number 7439976, serve as the basis for the soil volatilization to indoor air criteria, groundwater volatilization to indoor air, and soil inhalation criteria. Data for methyl mercury, CAS number 22967926, serve as the basis for the GSI criterion; and data for mercuric chloride, CAS number 7487947, serve as the basis for the drinking water, groundwater contact, soil direct contact, and the groundwater protection criteria. Comparison to criteria shall be based on species-specific analytical data only if sufficient facility characterization has been conducted to rule out the presence of other species of mercury.

MSSL Footnotes:

GW = The calculated value for a hazardous substance based upon shallow groundwater is considered protective when it is greater than the calculated value for groundwater.

J = Hazardous substance may be present in several isomer forms. Isomer-specific concentrations must be added together for comparison to screening level.

JT = Hazardous substance may be present in several isomer forms. Screening levels may be used for the individual isomer provided that it is the sole isomer detected; however, when multiple isomers are detected in a medium, the isomer-specific concentrations must be added together and compared to the most restrictive screening level of the detected isomers.

Laboratory Footnotes:

U = Analyte analyzed for but not detected above the reported sample reporting limit.



**TABLE 13-1**  
**Summary of Groundwater Analytical Results**  
**Area O**  
**Quincy Mining Company Portage Operations Area**  
**Abandoned Mining Wastes - Torch Lake Non-Superfund Site**

|                                                                                                         | Part 201 Generic Cleanup Criteria Evaluated                                          | Exceedance |
|---------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|------------|
| <b>EGLE Part 201 Generic Cleanup Criteria<br/>(December 2020)</b>                                       | [1] Residential Drinking Water Criteria                                              | NO         |
|                                                                                                         | [2] Nonresidential Drinking Water Criteria                                           | NO         |
|                                                                                                         | [3] Groundwater Surface Water Interface Criteria                                     | NO         |
|                                                                                                         | [4] Residential Groundwater Volatilization to Indoor Air Inhalation Criteria         | NO         |
|                                                                                                         | [5] Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria      | NO         |
|                                                                                                         | [6] Water Solubility                                                                 | NO         |
|                                                                                                         | [7] Flammability and Explosivity Screening                                           | NO         |
| <b>Media-Specific Volatilization to Indoor Air<br/>Interim Action Screening Levels<br/>(March 2021)</b> | [8] Shallow Groundwater Residential Media-Specific Screening Level (MSSL)            | NO         |
|                                                                                                         | [9] Shallow Groundwater Nonresidential MSSL                                          | NO         |
|                                                                                                         | [10] Groundwater Residential MSSL                                                    | NO         |
|                                                                                                         | [11] Groundwater Residential Time Sensitive Media-Specific Screening Level (TS MSSL) | NO         |
|                                                                                                         | [12] Groundwater Nonresidential MSSL                                                 | NO         |
|                                                                                                         | [13] Groundwater Nonresidential MSSL <sub>12</sub>                                   | NO         |
|                                                                                                         | [14] Groundwater Nonresidential TS MSSL <sub>12</sub>                                | NO         |

## 14. DETAILED FINDINGS – AREA P

This Section summarizes applicable information available for Area P within QMCP derived from implementation of the SAP. The narrative follows the systematic investigative approach outlined in **Section 3**, while providing specific details about the potential human health and ecological risks associated with the historical mining operations in the subarea of QMCP.

### 14.1 SITE INSPECTION AND INVESTIGATION RESULTS

The implementation of the site inspection and investigation activities provided critical lines of evidence that link the historical documentation and the current environmental conditions in and around the Portage Canal. The following subsections present the findings of the inspection and investigation activities and provide correlation of mining era operations and their potential impacts on the nearshore and offshore environment of the Portage Canal.

#### 14.1.1 Site Inspection

The site inspection at each subarea included the inventory and locating of historical structures and similar surficial artifacts associated with the former industrial operations in the area. Each subarea was also inspected for potential physical and health hazards that were documented, photographed, and located with a GPS unit. The inventoried hazards were then qualitatively assessed for potential human health and environmental risks to determine if analytical sampling was warranted during the targeted inspection phase of the work.

On September 27, 2018, MSG field team personnel performed reconnaissance activities at Area P. In the cases where access was not requested based on historic operational and investigative findings, property conditions were evaluated from a neighboring property or public right of way where access was permitted. Access to Area P was not requested based on historic operational and investigative findings.

Therefore, the property parcel known as The People's Store, including a residential dwelling and farm totaling approximately 21 acres was visually inspected and observations were recorded from the public road right of way. The following provides a summary of the findings associated with the reconnaissance activities. A copy of the reconnaissance log is provided in **Appendix C, Site Inspections – Reconnaissance Logs, Targeted Inspections & Physical Hazards Inventory**.

##### 14.1.1.1 Reconnaissance

The reconnaissance activities did not identify potentially abandoned containers or other environmental concerns. The qualitative assessment of the reconnaissance findings in Area P did not warrant the performance of limited targeted inspection activities.

#### 14.1.2 Site Investigation

Area P was not sampled nor was historic sampling data available as part of the SI Report. Other environmental concerns are not known and further investigation as part of QMCP did not occur.

## 15. DETAILED FINDINGS – PORTAGE CANAL

This Section summarizes the findings derived from implementation of the offshore sampling components of the SAP in the QMCP. Although critical to the understanding of contaminant migration into the Portage Canal, the terrestrial portion of the investigation is emphasized in the preceding detailed findings reports for each subarea. This Section provides a comprehensive assessment of the Portage Canal using analytical results derived from the SI. The narrative follows the offshore investigative approach outlined in **Section 3**, while providing specific details about the potential human health and ecological risks associated with mining era operations as they relate to the Portage Canal as a whole.

The offshore investigation included sediment, pore water, and submerged drum content sampling from the Portage Canal and the connecting waters of Dollar Bay. The following subsections present a summary of the analytical results derived from offshore sampling activities.

### 15.1 OFFSHORE INVESTIGATION RESULTS

Similar to the terrestrial investigation, the offshore investigation activities for the QMCP were also guided by several factors. Since in-lake historical analytical data was not available, terrestrial historical analytical data was evaluated to determine if adequate characterization data was available in each study area to assess the overall sediment and surface water quality in the Portage Canal. In addition, underwater surveillance of the area, as described in **Section 3**, was used to locate and assess potential offshore waste deposits. Lastly, field observations, both terrestrial and offshore, were used to position sampling locations. Sediment and surface water sampling completed as part of the SI was conducted in accordance with the sampling methods described in **Section 3**. The following subsections present the outcomes of offshore investigative activities completed in the Portage Canal by summarizing the laboratory analytical results and characterizing their impacts on the environmental media in which they were detected.

#### 15.1.1 Portage Canal

Offshore sediment, pore water, and submerged drum content samples were collected, but surface water samples were not collected from the Portage Canal during the SI. The following subsections present a summary of the analytical results derived from offshore sampling activities in the Portage Canal.

##### 15.1.1.1 Sediment Sampling Results

Sediment sampling activities were completed on September 5, 6, 7, and 28, 2018. During this time, a total of 30 sediment samples including three QA/QC field duplicate sample were collected from 16 sampling locations. Of the samples collected, 17 samples from eight locations were offshore from subareas included in this SI Report.

Sediment sampling locations included 16 surficial sediment samples, generally ranging from 0 to 1.25 ft in depth. The investigation also included 11 deeper sediment samples collected from depths up to 3.2 ft. All samples were analyzed for PCBs and SVOCs as identified in **Table 3-1, Sampling and Analysis Summary** of this SI Report. Two samples were also analyzed for VOCs while all but two samples were analyzed for inorganic compounds.

The analytical results for sediment samples collected during the SI identified multiple organic and inorganic COCs at concentrations that exceeded applicable screening levels across the QMCP, including offshore from Areas B, E, F, M, and O. COC exceedances were detected in sample locations off-shore from areas of known historic mining operations and areas of unknown historic use in the QMCP footprint. Total PCBs were not detected in any of the samples collected from the Portage Canal.

A detailed summary of sediment analytical results collected from the Portage Canal is provided in **Table 15-1, Sediment, Pore Water, and Submerged Drum Contents Analytical Results** and depicted in **Figure 15-1a** and **Figure 15-1b, Sediment, Pore Water, and Submerged Drum Contents Analytical Results**.

#### 15.1.1.2 Pore Water Sampling Results

No surface water samples were collected from the Portage Canal during implementation of the SI; however, seven pore water samples were collected from near sediment sample locations that indicated signs of contamination (sheen and/or odor) on September 6 and 10, 2018. Three of the pore water samples were offshore from subareas included in this SI Report. All samples were analyzed for PCBs, SVOCs, and inorganic constituents, with the exception of PS45 which was only analyzed for SVOCs, as identified in **Table 3-1, Sampling and Analysis Summary** of this SI Report.

The pore water analytical results for the samples contained multiple inorganic and organic COCs at concentrations above regulatory criteria and/or screening values. Analysis of pore water samples PS02 and PS06, collected off-shore from Areas B and E, respectively, detected at least one SVOC exceeding applicable screening values. Total PCBs were not detected in any of the samples collected from the Portage Canal.

A detailed summary of pore water analytical results collected from the Portage Canal is provided in **Table 15-1, Sediment, Pore Water, and Submerged Drum Contents Analytical Results** and depicted in **Figure 15-1a** and **15-1b, Sediment, Pore Water, and Submerged Drum Contents Analytical Results**.

#### 15.1.1.3 Submerged Drum Content Sampling Results

Submerged drum content sampling activities were completed on September 9, 2018. In conjunction with sediment and pore water sampling, a total of three submerged drum samples, ranging from 12.66 to 14.56 ft in water depth, were collected from three sampling locations. One of the submerged drum content samples was offshore from a subarea included in this SI Report. All samples were analyzed for PCBs, SVOCs, and inorganic constituents as identified in **Table 3-1, Sampling and Analysis Summary** of this SI Report.

Inorganic COCs were detected above applicable screening criteria in all three samples, while SVOCs were detected above applicable screening levels in submerged drum content samples SDM02 and SDM03. Sample SDM02 was collected offshore from Area E. Total PCBs were not detected in any of the samples collected from the Portage Canal.

A detailed summary of submerged drum contents analytical results collected from the Portage Canal are provided in **Table 15-1, Sediment, Pore Water, and Submerged Drum Contents Analytical Results** and depicted in **Figure 15-1a, Sediment, Pore Water, and Submerged Drum Contents Analytical Results**.

## 15.2 NATURE AND EXTENT OF CONTAMINATION

Utilizing the established regulatory criteria presented in **Section 4**, the laboratory analytical results summarized in the preceding section were reviewed and compared to the following criteria as applicable for the sampled environmental media:

- EGLE – Rule 57 Water Quality Values;
- EGLE Part 201 Cleanup Criteria for Response Action – Residential and Nonresidential DWC and GSIC;
- EPA Ecological Screening Values (ESVs); and,
- Sediment Quality Guidelines, Threshold Effect Concentrations (TECs) and Probable Effect Concentrations

(PECs), MacDonald, et al, 2000.

### 15.2.1 Comprehensive Exposure Assessment

The comparison was completed to determine which ecological and human exposure pathways, risks, and conditions are relevant in the Portage Canal. Although not inclusive of relevant pathways where criteria were not exceeded, the following exposure pathways were determined to be relevant in the Portage Canal as it pertains to the offshore investigative activities completed during the SI:

- Risks due to hazardous substances in sediments, pore water, and submerged drum contents.

#### 15.2.1.1 Portage Canal - Exposure Pathway Assessment

Sediment analytical results from the Portage Canal identified COC concentrations that were at or above concentrations that pose potential risks to sediment dwelling species, and consequently the food chain. The following table provides a summary of the sample locations located in the Portage Canal. The table lists only the number of samples for a specific analytical suite that contained one or more exceedance of a given criterion.

| Sediment Analytical Result Summary Table                             | Analytical Summary      |                   |                   | EPA Region IV, Freshwater Sediment Ecological Screening Values (March 2018)                                                                                                                                                                                                                              | Consensus Based Sediment Quality Guidelines |                                     |
|----------------------------------------------------------------------|-------------------------|-------------------|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------------------------------------|
|                                                                      | Total Number of Samples | Detected Analytes | Total Exceedances | Ecological Screening Values                                                                                                                                                                                                                                                                              | Threshold Effect Concentration (TEC)        | Probable Effect Concentration (PEC) |
| Inorganics                                                           | 28                      | 215               | 74                | 22                                                                                                                                                                                                                                                                                                       | 22                                          | 19                                  |
| Cyanide                                                              | 0                       | 0                 | 0                 | 0                                                                                                                                                                                                                                                                                                        | 0                                           | 0                                   |
| VOCs                                                                 | 2                       | 1                 | 1                 | 1                                                                                                                                                                                                                                                                                                        | 0                                           | 0                                   |
| SVOCs                                                                | 30                      | 108               | 107               | 16                                                                                                                                                                                                                                                                                                       | 16                                          | 10                                  |
| Total PCBs                                                           | 30                      | 0                 | 0                 | 0                                                                                                                                                                                                                                                                                                        | 0                                           | 0                                   |
| COCs exceeding applicable regulatory criteria in one or more samples |                         |                   |                   | ARSENIC, CHROMIUM, COPPER, LEAD, MANGANESE, MERCURY, SILVER, ZINC, ACENAPHTHENE, ACENAPHTHYLENE, ANTHRACENE, BENZO(A)ANTHRACENE, BENZO(A)PYRENE, BENZO(B)FLUORANTHENE, BENZO(K)FLUORANTHENE, CHRYSENE, FLUORANTHENE, FLUORENE, INDENO(1,2,3-CD)PYRENE, NAPHTHALENE (SVOC), PHENANTHRENE, PYRENE, TOLUENE |                                             |                                     |

The pore water analytical results from the Portage Canal identified COC concentrations that were at or above concentrations that pose potential risks to ecological receptors, and consequently the food chain. The following table provides a summary of the sample locations located in the Portage Canal. The table lists only the number of samples for a specific analytical suite that contained one or more exceedance of a given criterion.

| Porewater Analytical Result Summary Table                            | Analytical Summary      |                   |                   | Cleanup Criteria Requirements for Response Activity                     |                                        |                                              | EPA Region IV Surface Water Ecological Screening Values (March 2018) |                                                           | EGLE Rule 57 Water Quality Values              |                                            |                |
|----------------------------------------------------------------------|-------------------------|-------------------|-------------------|-------------------------------------------------------------------------|----------------------------------------|----------------------------------------------|----------------------------------------------------------------------|-----------------------------------------------------------|------------------------------------------------|--------------------------------------------|----------------|
|                                                                      | Total Number of Samples | Detected Analytes | Total Exceedances | Residential Drinking Water Criteria                                     | Nonresidential Drinking Water Criteria | Groundwater Surface Water Interface Criteria | Region IV Freshwater Ecological Screening Value - Acute              | Region IV Freshwater Ecological Screening Value - Chronic | Human Non-Cancer Value - Drinking Water Source | Human Cancer Value - Drinking Water Source | Wildlife Value |
| Inorganics                                                           | 6                       | 41                | 22                | 6                                                                       | 6                                      | 6                                            | 6                                                                    | 6                                                         | 2                                              | 0                                          | 0              |
| Cyanide                                                              | 0                       | 0                 | 0                 | 0                                                                       | 0                                      | 0                                            | 0                                                                    | 0                                                         | 0                                              | 0                                          | 0              |
| VOCs                                                                 | 0                       | 0                 | 0                 | 0                                                                       | 0                                      | 0                                            | 0                                                                    | 0                                                         | 0                                              | 0                                          | 0              |
| SVOCs                                                                | 7                       | 8                 | 4                 | 0                                                                       | 0                                      | 1                                            | 1                                                                    | 2                                                         | 0                                              | 0                                          | 0              |
| Total PCBs                                                           | 6                       | 0                 | 0                 | 0                                                                       | 0                                      | 0                                            | 0                                                                    | 0                                                         | 0                                              | 0                                          | 0              |
| COCs exceeding applicable regulatory criteria in one or more samples |                         |                   |                   | COPPER, LEAD, MANGANESE, SILVER, ANTHRACENE, FLUORANTHENE, PHENANTHRENE |                                        |                                              |                                                                      |                                                           |                                                |                                            |                |

Submerged drum contents analytical results from the Portage Canal identified COC concentrations that were at or above concentrations that pose potential risks to sediment dwelling species, and consequently the food chain. The following table provides a summary of the sample locations located in the Portage Canal. The table lists only the number of samples for a specific analytical suite that contained one or more exceedance of a given criterion.

| Submerged Drum Contents Analytical Result Summary Table              | Analytical Summary      |                   |                   | EPA Region IV, Freshwater Sediment Ecological Screening Values (March 2018) | Consensus Based Sediment Quality Guidelines |                                     |
|----------------------------------------------------------------------|-------------------------|-------------------|-------------------|-----------------------------------------------------------------------------|---------------------------------------------|-------------------------------------|
|                                                                      | Total Number of Samples | Detected Analytes | Total Exceedances | Ecological Screening Values                                                 | Threshold Effect Concentration (TEC)        | Probable Effect Concentration (PEC) |
| Inorganics                                                           | 3                       | 27                | 14                | 3                                                                           | 3                                           | 3                                   |
| Cyanide                                                              | 0                       | 0                 | 0                 | 0                                                                           | 0                                           | 0                                   |
| VOCs                                                                 | 0                       | 0                 | 0                 | 0                                                                           | 0                                           | 0                                   |
| SVOCs                                                                | 3                       | 3                 | 3                 | 2                                                                           | 2                                           | 1                                   |
| Total PCBs                                                           | 3                       | 0                 | 0                 | 0                                                                           | 0                                           | 0                                   |
| COCs exceeding applicable regulatory criteria in one or more samples |                         |                   |                   | ARSENIC, COPPER, LEAD, MANGANESE, MERCURY, SILVER, FLUORANTHENE, PYRENE     |                                             |                                     |



## 15.2.2 Portage Canal - Extent of Contamination

The comparison of analytical results to applicable regulatory criteria indicates that potential human health and ecological risks are present in contaminated sediment, pore water, and submerged drum contents in the Portage Canal. The following subsections describe the extent of contamination.

### 15.2.2.1 Sediment - Extent of Contamination

Analytical results from sediment samples collected from offshore of the various subareas along the Portage Canal identified COCs in both surficial and deep sediment samples. These results varied between subareas likely due to the varying operational and remedial history within each area. The following provides a summary of the analytical results and their relevance to potential exposure risks for human and ecological receptors:

- Inorganic COCs – Inorganic COCs were detected at or in excess of applicable screening values or guidelines adjacent to the following subareas:
  - Area B;
  - Area E;
  - Area F;
  - Area M;
  - Area O;
  - Area P; and,
  - Other subareas/parcels addressed in other reports.

As indicated by the number of locations summarized above, metals are prevalent in the region and the related exceedances, although potentially detrimental to aquatic biota, remain a consistent finding in sediment samples collected from across the Project area. Nevertheless, exceedances of inorganic COC screening values in sediment should be considered when evaluating the extent of contamination in the Portage Canal.

- VOCs – Of the two samples that were analyzed for VOCs, toluene was detected at a concentration exceeding a screening value in SS62 in the ditch adjacent to the east side of Area F. While the upstream limit of toluene impact may be provided by SS61, the limits of impact in other directions have not been defined.
- SVOCs – SVOCs were detected in sediment at or in excess of applicable screening values or guidelines adjacent to the following subareas:
  - Area B;
  - Area E;
  - Area F;
  - Area M; and,
  - Other subareas/parcels addressed in other reports.

The detection of SVOCs in sediment samples is likely indicative of a nearby contaminant source, versus the ubiquitous nature of the inorganic COCs described above. SVOC contamination in sediment presents risks both to benthic organisms and human health due to their close proximity to the shoreline. The potential risks associated with SVOCs in nearshore sediment may be an indication of a terrestrial source of contamination that should be considered when evaluating the extent of sediment contamination in the Portage Canal.

- Total PCBs – Total PCBs were not detected in sediment samples collected as part of the SI.

#### 15.2.2.2 Pore Water – Extent of Contamination

Analytical results from pore water samples collected from the Portage Canal identified inorganic and SVOC impacts exceeding applicable screening values and comparable criteria. These results varied between subareas likely due to the varying operational and remedial history within each area, and possibly due to the presence of potential source areas as described above. The following provides a summary of the analytical results and their relevance to potential exposure risks for human and ecological receptors:

- Inorganic COCs – Inorganic COCs were detected at or in excess of applicable screening values offshore from the following subareas:
  - Area B;
  - Area E;
  - Area F; and,
  - Other subareas/parcels addressed in other reports.

Similar to the previously discussed sediment sample results, metals are ubiquitous in the study area and are predominantly the result of the presence of stamp sands. Stamp sands are not defined as a hazardous substance nor are they subject to regulation under Part 201 unless the property otherwise contains hazardous substances in excess of concentrations that satisfy the cleanup criteria for unrestricted residential use. The related exceedances, although potentially detrimental to aquatic biota, remain a consistent finding in samples collected from the Project area. Nevertheless, exceedances of inorganic COCs in pore water should be considered when evaluating the extent of contamination in the Portage Canal.

- VOCs – Pore water samples collected as part of the SI were not analyzed for the presence of VOCs.
- SVOCs – SVOCs were detected in pore water at or in excess of applicable screening values offshore from the following subareas:
  - Area B; and,
  - Area E.

The detection of SVOCs in pore water samples is likely indicative of a nearby contaminant source. SVOC contamination in pore water presents risks both to benthic organisms and potentially human health due to their close proximity to the shoreline. The potential risks associated with SVOCs in pore water from nearshore sediment may be an indication a terrestrial source of contamination that should be considered when evaluating the extent of contamination in the Portage Canal.

- Total PCBs – Total PCBs were not detected in pore water samples collected as part of the SI.

#### 15.2.2.3 Submerged Drum Contents – Extent of Contamination

Analytical results from submerged drum content samples collected from within the Portage Canal identified multiple inorganic and SVOC contaminants. Specific to this SI report, samples were collected offshore of Area E where historic mining operations and/or practices were unknown. However, sample locations were adjacent to property where historic mining operations and/or practices were known to have occurred. Due to the varying operational and remedial history within each subarea, the presence of potential source areas as described above are possible. The following provides a summary of the analytical results and their relevance to potential exposure risks for human and ecological receptors:

- Inorganic COCs – Inorganic COCs were detected at or in excess of applicable screening values offshore from the following subareas:
  - Area E.

Similar to the previously discussed sediment sample results, metals are ubiquitous in the study area and are predominantly the result of the presence of stamp sands. Stamp sands are not defined as a hazardous substance nor are they subject to regulation under Part 201 unless the property otherwise contains hazardous substances in excess of concentrations that satisfy the cleanup criteria for unrestricted residential use. The related exceedances, although potentially detrimental to aquatic biota, remain a consistent finding in samples collected from the Project area. Nevertheless, exceedances of inorganic COCs in submerged drum contents that may not be associated with stamp sand should be considered when evaluating the extent of contamination in the Portage Canal.

- VOCs – Submerged drum content samples collected as part of the SI were not analyzed for the presence of VOCs.
- SVOCs – SVOCs were detected in submerged drum content samples at or in excess of applicable screening value offshore from the following subareas:
  - Area E.

The detection of SVOCs in submerged drum content samples are indicative of drum contents or possibly of a nearby contaminant source. SVOC contamination in submerged drum content samples present risks both to benthic organisms and human health due to their close proximity to the shoreline. The limits of SVOC impacts associated with submerged drums has not been defined but is anticipated to be proximal to the respective drums if the SVOC impact is the result of drum contents and not other sources.

- Total PCBs – Total PCBs were not detected in submerged drum content samples collected as part of the SI.

### **15.3 CONCLUSIONS AND RECOMMENDATIONS**

The analytical results and interpretation summarized in the preceding subsections document ecological and potential human health risks that are present in the Portage Canal and the implications of those findings on environmental conditions throughout connected waterbodies such as Portage Lake and Torch Lake. The following subsections provide a synopsis of these findings and a recommended path forward for mitigating these risks in the QMCP and subsequently, Portage Canal.

#### **15.3.1 Conclusions**

Environmental impacts in the QMCP are generally characterized by detections of organic and inorganic contaminants in sediment, pore water, and submerged drum contents, repercussions of mining era operations in the region. Although specific sources of these contaminants may not be fully understood, historical research related to the operations, closing, and eventual abandonment/scraping of mining company operations provided substantive evidence for assessing specific operational areas and selecting target analytes anticipated to be present in environmental media throughout the area. The findings of these investigative activities, specifically as it relates to concentrations of contaminants in sediment, pore water, and submerged drum contents are summarized as follows:

#### Sediment

- Inorganic COCs – Inorganic COCs were detected at or in excess of applicable screening values offshore from the following subareas:
  - Area B;
  - Area E;
  - Area F;
  - Area M;
  - Area O;
  - Area P; and,
  - Other subareas/parcels addressed in other reports.
- VOCs – Toluene was detected at a concentration exceeding a screening value in SS62 in the ditch adjacent to the east side of Area F. While the upstream limit of toluene impact may be provided by SS61, the limits of impact in other directions have not been defined.
- SVOCs – SVOCs were detected in sediment at or in excess of applicable screening values offshore from the following subareas:
  - Area B;
  - Area E;
  - Area F;
  - Area M; and,
  - Other subareas/parcels addressed in other reports.
- Total PCBs – Total PCBs were not detected in sediment at or above applicable screening values in any of the samples collected.

#### Pore Water

- Inorganic COCs – Inorganic COCs were detected at or in excess of applicable screening values offshore from the following subareas:
  - Area B;
  - Area E;
  - Area F; and,
  - Other subareas/parcels addressed in other reports.
- VOCs – VOCs were not sampled in pore water samples collected as part of the SI.
- SVOCs – SVOCs were detected in pore water at or in excess of applicable regulatory criteria offshore from the following study areas:
  - Area B; and,
  - Area E.
- Total PCBs – Total PCBs were not detected in pore water at or above applicable screening values in any of the samples collected.

Sediment samples collected throughout the Portage Canal from the conceptual boundaries of QMCP contained multiple detections of inorganic COCs and SVOCs that exceeded applicable ecological screening values. Interpretation

of the results indicates that at least certain locations may be indicative of terrestrial source areas, particularly at properties of known historic mining related operations, such as Area B, Area F, and Area M.

A limited number of pore water samples were collected from Portage Canal and while PCBs were not detected in any of the samples at or above applicable screening values, exceedances of inorganic COCs and SVOCs were detected. Pore water results offshore of Area B and Area E may be indicative of historic offshore waste deposits and/or groundwater impacts venting to surface water.

Submerged drum contents sampling locations were primarily offshore from areas addressed as part of other EGLE SI investigations; however, they were near Area E. Historical mining era practices and/or operations are unknown in Area E.

### **15.3.2 Recommendations**

SI results have confirmed that potential ongoing sources of contamination are present in the Portage Canal. For the QMCP Areas where potential upland sources of these COCs have not previously been addressed, evaluation of remedial alternatives to mitigate concerns related to human health and/or the environment could be conducted.

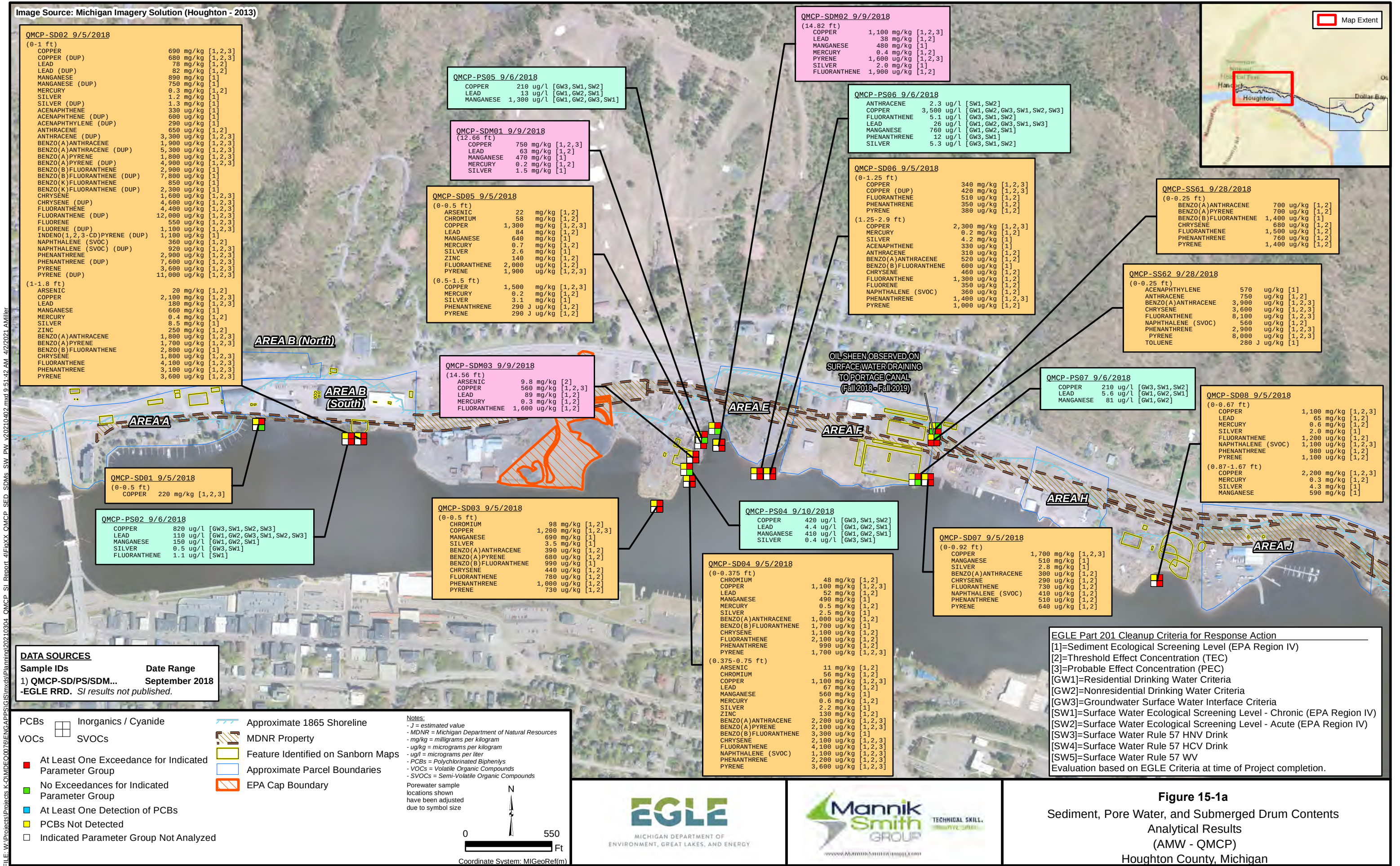
ELGE should continue to provide new study data to the Remediation and Redevelopment Division Superfund Section (RRD SFS), which is responsible for monitoring EPA's remedy for the terrestrial and lake portions of the Torch Lake Superfund Site. RRD SFS should evaluate whether any remedy modifications are necessary. The EPA and RRD SFS should verify that administrative controls for areas that have been previously remediated by the EPA have been employed to ensure that the selected remedy is performing as designed and those institutional controls, where required, have been recorded and are being enforced.

## FIGURES

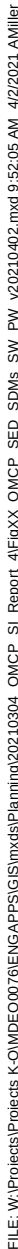
### DETAILED FINDINGS REPORT – PORTAGE CANAL













## TABLES

### DETAILED FINDINGS REPORT – PORTAGE CANAL



TABLE 15-1  
Sediment, Pore Water, and Submerged Drum Contents Analytical Results  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code              |            | EPA Region IV<br>Sediment ESVs                      | Sediment Quality<br>Guidelines              |                                            | EGLE Part 201 Groundwater<br>Generic Cleanup Criteria |                                                          |                                                                | EPA Region IV<br>Surface Water ESVs                  |                                                    | EGLE Rule 57<br>Water Quality Values                       | Sediment - Ripley Waterfront |         |                 |         |                 |         |                    |         |                    |         |                 |         |                   |         |                   |         |                 |         |                  |         |
|----------------------------|------------|-----------------------------------------------------|---------------------------------------------|--------------------------------------------|-------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------------|------------------------------------------------------|----------------------------------------------------|------------------------------------------------------------|------------------------------|---------|-----------------|---------|-----------------|---------|--------------------|---------|--------------------|---------|-----------------|---------|-------------------|---------|-------------------|---------|-----------------|---------|------------------|---------|
| Station Name               | CAS Number | [1]<br>Region IV<br>ESV -<br>Freshwater<br>Sediment | [2]<br>Threshold<br>Effect<br>Concentration | [3]<br>Probable<br>Effect<br>Concentration | [GW1]<br>Residential<br>Drinking<br>Water<br>Criteria | [GW2]<br>Nonresidential<br>Drinking<br>Water<br>Criteria | [GW3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [SW1]<br>Region IV<br>Freshwater<br>ESV -<br>Chronic | [SW2]<br>Region IV<br>Freshwater<br>ESV -<br>Acute | [SW3]<br>Rule 57<br>Human<br>Noncancer<br>Value -<br>Drink | QMCP-SD01                    |         |                 |         | QMCP-SD02       |         |                    |         | QMCP-SD03          |         | QMCP-SD04       |         |                   |         | QMCP-SD05         |         |                 |         |                  |         |
| Sample ID                  |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            | QMCP-SD01-0-6"               |         | QMCP-SD01-6-26" |         | QMCP-SD02-0-12" |         | QMCP-SD02-0-12" FD |         | QMCP-SD02-12-21.5" |         | QMCP-SD 03-0-6" |         | QMCP-SD 04-0-4.5" |         | QMCP-SD 04-4.5-9" |         | QMCP-SD 05-0-6" |         | QMCP-SD 05-6-18" |         |
| Sample Date                |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            | 9/5/2018                     |         | 9/5/2018        |         | 9/5/2018        |         | 9/5/2018           |         | 9/5/2018           |         | 9/5/2018        |         | 9/5/2018          |         | 9/5/2018          |         | 9/5/2018        |         | 9/5/2018         |         |
| Sample Interval (bgs)      |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            | 0 - 0.5 ft                   |         | 0.5 - 2.2 ft    |         | 0 - 1 ft        |         | 0 - 1 ft           |         | 1 - 1.79 ft        |         | 0 - 0.5 ft      |         | 0 - 0.375 ft      |         | 0.375 - 0.75 ft   |         | 0 - 0.5 ft      |         | 0.5 - 1.5 ft     |         |
| Sample Description         |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            | --                           |         | --              |         | --              |         | --                 |         | --                 |         | --              |         | --                |         | --                |         | --              |         | --               |         |
|                            |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            | Result                       | Exceeds | Result          | Exceeds | Result          | Exceeds | Result             | Exceeds | Result             | Exceeds | Result          | Exceeds | Result            | Exceeds | Result            | Exceeds | Result          | Exceeds | Result           | Exceeds |
| Inorganics- Metals (mg/kg) |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            |                              |         |                 |         |                 |         |                    |         |                    |         |                 |         |                   |         |                   |         |                 |         |                  |         |
| ARSENIC                    | 7440-38-2  | 9.8                                                 | 9.79                                        | 33                                         | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | 3                            | --      | 0.6             | --      | 6.8             | --      | 8                  | --      | 20                 | [1,2]   | 2.7             | --      | 8.2               | --      | 11                | [1,2]   | 22              | [1,2]   | 2.8              | --      |
| CADMIUM                    | 7440-43-9  | 1                                                   | 0.99                                        | 4.98                                       | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | <0.2 U                       | --      | <0.2 U          | --      | 0.2             | --      | 0.3                | --      | 0.9                | --      | <0.2 U          | --      | 0.4               | --      | 0.4               | --      | 0.7             | --      | 0.2              | --      |
| CHROMIUM                   | 7440-47-3  | 43.4                                                | 43.4                                        | 111                                        | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | 20                           | --      | 2.3             | --      | 20              | --      | 20                 | --      | 41                 | --      | 98              | [1,2]   | 48                | [1,2]   | 56                | [1,2]   | 58              | [1,2]   | 27               | --      |
| COPPER                     | 7440-50-8  | 31.6                                                | 31.6                                        | 149                                        | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | 220                          | [1,2,3] | 4.4             | --      | 690             | [1,2,3] | 680                | [1,2,3] | 2,100              | [1,2,3] | 1,200           | [1,2,3] | 1,100             | [1,2,3] | 1,100             | [1,2,3] | 1,300           | [1,2,3] | 1,500            | [1,2,3] |
| LEAD                       | 7439-92-1  | 35.8                                                | 35.8                                        | 128                                        | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | 11                           | --      | <1.0 U          | --      | 78              | [1,2]   | 82                 | [1,2]   | 180                | [1,2,3] | 17              | --      | 52                | [1,2]   | 67                | [1,2]   | 84              | [1,2]   | 11               | --      |
| MANGANESE                  | 7439-96-5  | 460                                                 | NA                                          | NA                                         | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | 210                          | --      | 35              | --      | 890             | [1]     | 750                | [1]     | 660                | [1]     | 690             | [1]     | 490               | [1]     | 560               | [1]     | 640             | [1]     | 460              | --      |
| MERCURY                    | 7439-97-6  | 0.18                                                | 0.18                                        | 1.06                                       | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | 0.09                         | --      | <0.06 U         | --      | 0.3             | [1,2]   | 0.1                | --      | 0.4                | [1,2]   | 0.1             | --      | 0.5               | [1,2]   | 0.6               | [1,2]   | 0.7             | [1,2]   | 0.2              | [1,2]   |
| SILVER                     | 7440-22-4  | 1                                                   | NA                                          | NA                                         | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | 0.4                          | --      | <0.1 U          | --      | 1.2             | [1]     | 1.3                | [1]     | 8.5                | [1]     | 3.5             | [1]     | 2.5               | [1]     | 2.2               | [1]     | 2.6             | [1]     | 3.1              | [1]     |
| ZINC                       | 7440-66-6  | 121                                                 | 121                                         | 459                                        | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | 34                           | --      | 3.6             | --      | 110             | --      | 99                 | --      | 250                | [1,2]   | 94              | --      | 99                | --      | 130               | [1,2]   | 140             | [1,2]   | 66               | --      |
| Inorganics - Metals (ug/l) |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            |                              |         |                 |         |                 |         |                    |         |                    |         |                 |         |                   |         |                   |         |                 |         |                  |         |
| ARSENIC                    | 7440-38-2  | NA                                                  | NA                                          | NA                                         | 10 (A)                                                | 10 (A)                                                   | 10                                                             | 150 ^                                                | 340 ^                                              | 10                                                         | NA                           | --      | NA              | --      | NA              | --      | NA                 | --      | NA                 | --      | NA              | --      | NA                | --      | NA                | --      | NA              | --      | NA               | --      |
| BARIUM                     | 7440-39-3  | NA                                                  | NA                                          | NA                                         | 2,000 (A,B)                                           | 2,000 (A,B)                                              | 200 (B,G)                                                      | 220                                                  | 2,000                                              | 1,900                                                      | NA                           | --      | NA              | --      | NA              | --      | NA                 | --      | NA                 | --      | NA              | --      | NA                | --      | NA                | --      | NA              | --      | NA               | --      |
| CHROMIUM                   | 7440-47-3  | NA                                                  | NA                                          | NA                                         | 100 (A,B,H)                                           | 100 (A,B,H)                                              | 40 (B,G,H,X)                                                   | NA                                                   | NA                                                 | 120                                                        | NA                           | --      | NA              | --      | NA              | --      | NA                 | --      | NA                 | --      | NA              | --      | NA                | --      | NA                | --      | NA              | --      | NA               | --      |
| COPPER                     | 7440-50-8  | NA                                                  | NA                                          | NA                                         | 1,000 (B,E)                                           | 1,000 (B,E)                                              | 4.7 (B,G)                                                      | 4.94 ^ *                                             | 6.94 ^ *                                           | 470                                                        | NA                           | --      | NA              | --      | NA              | --      | NA                 | --      | NA                 | --      | NA              | --      | NA                | --      | NA                | --      | NA              | --      | NA               | --      |
| LEAD                       | 7439-92-1  | NA                                                  | NA                                          | NA                                         | 4.0 (B,L)                                             | 4.0 (B,L)                                                | 14 (B,G,X)                                                     | 1.23 ^ *                                             | 31.6 ^ *                                           | 14                                                         | NA                           | --      | NA              | --      | NA              | --      | NA                 | --      | NA                 | --      | NA              | --      | NA                | --      | NA                | --      | NA              | --      | NA               | --      |
| MANGANESE                  | 7439-96-5  | NA                                                  | NA                                          | NA                                         | 50 (B,E)                                              | 50 (B,E)                                                 | 1,000 (B,G,X)                                                  | 93                                                   | 1,680                                              | 1,300                                                      | NA                           | --      | NA              | --      | NA              | --      | NA                 | --      | NA                 | --      | NA              | --      | NA                | --      | NA                | --      | NA              | --      | NA               | --      |
| SILVER                     | 7440-22-4  | NA                                                  | NA                                          | NA                                         | 34 (B)                                                | 98 (B)                                                   | 0.2 (B,M)                                                      | 0.06 ^ *                                             | 1.05 ^ *                                           | 130                                                        | NA                           | --      | NA              | --      | NA              | --      | NA                 | --      | NA                 | --      | NA              | --      | NA                | --      | NA                | --      | NA              | --      | NA               | --      |
| ZINC                       | 7440-66-6  | NA                                                  | NA                                          | NA                                         | 2,400 (B)                                             | 5,000 (B,E)                                              | 63 (B,G)                                                       | 64 ^ *                                               | 64 ^ *                                             | 3,300                                                      | NA                           | --      | NA              | --      | NA              | --      | NA                 | --      | NA                 | --      | NA              | --      | NA                | --      | NA                | --      | NA              | --      | NA               | --      |
| Organics- PCBs (ug/kg)     |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            |                              |         |                 |         |                 |         |                    |         |                    |         |                 |         |                   |         |                   |         |                 |         |                  |         |
| TOTAL PCBs                 | 1336-36-3  | 59.8                                                | 59.8                                        | 676                                        | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | ND                           | --      | ND              | --      | ND              | --      | ND                 | --      | ND                 | --      | ND              | --      | ND                | --      | ND                | --      | ND              | --      | ND               | --      |
| Organics - PCBs (ug/l)     |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            |                              |         |                 |         |                 |         |                    |         |                    |         |                 |         |                   |         |                   |         |                 |         |                  |         |
| TOTAL PCBs                 | 1336-36-6  | NA                                                  | NA                                          | NA                                         | 0.5 (A,J,T)                                           | 0.5 (A,J,T)                                              | 0.2 (J,M,T)                                                    | 0.014                                                | 0.014                                              | NLS (#,@)                                                  | NA                           | --      | NA              | --      | NA              | --      | NA                 | --      | NA                 | --      | NA              | --      | NA                | --      | NA                | --      | NA              | --      | NA               | --      |

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 15-1  
Sediment, Pore Water, and Submerged Drum Contents Analytical Results  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code           |            | EPA Region IV Sediment ESVs                         | Sediment Quality Guidelines                 |                                            | EGLE Part 201 Groundwater Generic Cleanup Criteria    |                                                          |                                                                | EPA Region IV Surface Water ESVs                     |                                                    | EGLE Rule 57 Water Quality Values                          | Sediment - Ripley Waterfront |         |                 |         |                 |         |                    |         |                    |         |                 |         |                   |         |                   |         |                 |         |                  |         |
|-------------------------|------------|-----------------------------------------------------|---------------------------------------------|--------------------------------------------|-------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------------|------------------------------------------------------|----------------------------------------------------|------------------------------------------------------------|------------------------------|---------|-----------------|---------|-----------------|---------|--------------------|---------|--------------------|---------|-----------------|---------|-------------------|---------|-------------------|---------|-----------------|---------|------------------|---------|
| Station Name            | CAS Number | [1]<br>Region IV<br>ESV -<br>Freshwater<br>Sediment | [2]<br>Threshold<br>Effect<br>Concentration | [3]<br>Probable<br>Effect<br>Concentration | [GW1]<br>Residential<br>Drinking<br>Water<br>Criteria | [GW2]<br>Nonresidential<br>Drinking<br>Water<br>Criteria | [GW3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [SW1]<br>Region IV<br>Freshwater<br>ESV -<br>Chronic | [SW2]<br>Region IV<br>Freshwater<br>ESV -<br>Acute | [SW3]<br>Rule 57<br>Human<br>Noncancer<br>Value -<br>Drink | QMCP-SD01                    |         |                 |         | QMCP-SD02       |         |                    |         | QMCP-SD03          |         | QMCP-SD04       |         |                   |         | QMCP-SD05         |         |                 |         |                  |         |
| Sample ID               |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            | QMCP-SD01-0-6"               |         | QMCP-SD01-6-26" |         | QMCP-SD02-0-12" |         | QMCP-SD02-0-12" FD |         | QMCP-SD02-12-21.5" |         | QMCP-SD 03-0-6" |         | QMCP-SD 04-0-4.5" |         | QMCP-SD 04-4.5-9" |         | QMCP-SD 05-0-6" |         | QMCP-SD 05-6-18" |         |
| Sample Date             |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            | 9/5/2018                     |         | 9/5/2018        |         | 9/5/2018        |         | 9/5/2018           |         | 9/5/2018           |         | 9/5/2018        |         | 9/5/2018          |         | 9/5/2018          |         | 9/5/2018        |         | 9/5/2018         |         |
| Sample Interval (bgs)   |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            | 0 - 0.5 ft                   |         | 0.5 - 2.2 ft    |         | 0 - 1 ft        |         | 0 - 1 ft           |         | 1 - 1.79 ft        |         | 0 - 0.5 ft      |         | 0 - 0.375 ft      |         | 0.375 - 0.75 ft   |         | 0 - 0.5 ft      |         | 0.5 - 1.5 ft     |         |
| Sample Description      |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            | --                           |         | --              |         | --              |         | --                 |         | --                 |         | --              |         | --                |         | --                |         | --              |         | --               |         |
|                         |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            | Result                       | Exceeds | Result          | Exceeds | Result          | Exceeds | Result             | Exceeds | Result             | Exceeds | Result          | Exceeds | Result            | Exceeds | Result            | Exceeds | Result          | Exceeds | Result           | Exceeds |
| Organics- SVOCs (ug/kg) |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            |                              |         |                 |         |                 |         |                    |         |                    |         |                 |         |                   |         |                   |         |                 |         |                  |         |
| ACENAPHTHENE            | 83-32-9    | 6.7                                                 | NA                                          | NA                                         | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | <710 U                       | --      | <240 U          | --      | 330             | [1]     | 600                | [1]     | <850 U             | --      | <250 U          | --      | <870 U            | --      | <940 U            | --      | <1800 U         | --      | <300 U           | --      |
| ACENAPHTHYLENE          | 208-96-8   | 5.9                                                 | NA                                          | NA                                         | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | <710 U                       | --      | <240 U          | --      | <290 U          | --      | 290                | [1]     | <850 U             | --      | <250 U          | --      | <870 U            | --      | <940 U            | --      | <1800 U         | --      | <300 U           | --      |
| ANTHRACENE              | 120-12-7   | 57                                                  | 57.2                                        | 845                                        | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | <710 U                       | --      | <240 U          | --      | 650             | [1,2]   | 3,300              | [1,2,3] | <850 U             | --      | <250 U          | --      | <870 U            | --      | <940 U            | --      | <1800 U         | --      | <300 U           | --      |
| BENZO(A)ANTHRACENE      | 56-55-3    | 108                                                 | 108                                         | 1,050                                      | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | <710 U                       | --      | <240 U          | --      | 1,900           | [1,2,3] | 5,300              | [1,2,3] | 1,800              | [1,2,3] | 390             | [1,2]   | 1,000             | [1,2]   | 2,200             | [1,2,3] | <1800 U         | --      | <300 U           | --      |
| BENZO(A)PYRENE          | 50-32-8    | 150                                                 | 150                                         | 1,450                                      | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | <1400 U                      | --      | <490 U          | --      | 1,800           | [1,2,3] | 4,900              | [1,2,3] | 1,700              | [1,2,3] | 680             | [1,2]   | <1700 U           | --      | 2,100             | [1,2,3] | <3600 U         | --      | <600 U           | --      |
| BENZO(B)FLUORANTHENE    | 205-99-2   | 190                                                 | NA                                          | NA                                         | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | <1400 U                      | --      | <490 U          | --      | 2,900           | [1]     | 7,800              | [1]     | 2,800              | [1]     | 990             | [1]     | 1,700             | [1]     | 3,300             | [1]     | <3600 U         | --      | <600 U           | --      |
| BENZO(K)FLUORANTHENE    | 207-08-9   | 240                                                 | NA                                          | NA                                         | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | <1400 U                      | --      | <490 U          | --      | 850             | [1]     | 2,300              | [1]     | <1700 U            | --      | <510 U          | --      | <1700 U           | --      | <1900 U           | --      | <3600 U         | --      | <600 U           | --      |
| CHRYSENE                | 218-01-9   | 166                                                 | 166                                         | 1,290                                      | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | <710 U                       | --      | <240 U          | --      | 1,600           | [1,2,3] | 4,600              | [1,2,3] | 1,800              | [1,2,3] | 440             | [1,2]   | 1,100             | [1,2]   | 2,100             | [1,2,3] | <1800 U         | --      | <300 U           | --      |
| FLUORANTHENE            | 206-44-0   | 423                                                 | 423                                         | 2,230                                      | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | <710 U                       | --      | <240 U          | --      | 4,400           | [1,2,3] | 12,000             | [1,2,3] | 4,100              | [1,2,3] | 780             | [1,2]   | 2,100             | [1,2]   | 4,100             | [1,2,3] | 2,000           | [1,2]   | 350              | --      |
| FLUORENE                | 86-73-7    | 77                                                  | 77.4                                        | 536                                        | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | <710 U                       | --      | <240 U          | --      | 550             | [1,2,3] | 1,100              | [1,2,3] | <850 U             | --      | <250 U          | --      | <870 U            | --      | <940 U            | --      | <1800 U         | --      | <300 U           | --      |
| INDENO(1,2,3-CD)PYRENE  | 193-39-5   | 200                                                 | NA                                          | NA                                         | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | <1400 U                      | --      | <490 U          | --      | <580 U          | --      | 1,100              | [1]     | <1700 U            | --      | <510 U          | --      | <1700 U           | --      | <1900 U           | --      | <3600 U         | --      | <600 U           | --      |
| NAPHTHALENE (SVOC)      | 91-20-3S   | 176                                                 | 176                                         | 561                                        | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | <710 U                       | --      | <240 U          | --      | 360             | [1,2]   | 920                | [1,2,3] | <850 U             | --      | <250 U          | --      | <870 U            | --      | 1,100             | [1,2,3] | <1800 U         | --      | <300 U           | --      |
| PHENANTHRENE            | 85-01-8    | 204                                                 | 204                                         | 1,170                                      | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | <710 U                       | --      | <240 U          | --      | 2,900           | [1,2,3] | 7,600              | [1,2,3] | 3,100              | [1,2,3] | 1,000           | [1,2]   | 990               | [1,2]   | 2,200             | [1,2,3] | <1800 U         | --      | 290 J            | [1,2]   |
| PYRENE                  | 129-00-0   | 195                                                 | 195                                         | 1,520                                      | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | <710 U                       | --      | <240 U          | --      | 3,600           | [1,2,3] | 11,000             | [1,2,3] | 3,600              | [1,2,3] | 730             | [1,2]   | 1,700             | [1,2,3] | 3,600             | [1,2,3] | 1,900           | [1,2,3] | 290 J            | [1,2]   |
| Organics - SVOCs (ug/l) |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            |                              |         |                 |         |                 |         |                    |         |                    |         |                 |         |                   |         |                   |         |                 |         |                  |         |
| ACENAPHTHENE            | 83-32-9    | NA                                                  | NA                                          | NA                                         | 1,300                                                 | 3,800                                                    | 38                                                             | 15                                                   | 19                                                 | 580                                                        | NA                           | --      | NA              | --      | NA              | --      | NA                 | --      | NA                 | --      | NA              | --      | NA                | --      | NA                | --      | NA              | --      | NA               | --      |
| ANTHRACENE              | 120-12-7   | NA                                                  | NA                                          | NA                                         | 43 (S)                                                | 43 (S)                                                   | ID                                                             | 0.02                                                 | 0.18                                               | 1,900                                                      | NA                           | --      | NA              | --      | NA              | --      | NA                 | --      | NA                 | --      | NA              | --      | NA                | --      | NA                | --      | NA              | --      | NA               | --      |
| FLUORANTHENE            | 206-44-0   | NA                                                  | NA                                          | NA                                         | 210 (S)                                               | 210 (S)                                                  | 1.6                                                            | 0.8                                                  | 3.7                                                | 18                                                         | NA                           | --      | NA              | --      | NA              | --      | NA                 | --      | NA                 | --      | NA              | --      | NA                | --      | NA                | --      | NA              | --      | NA               | --      |
| FLUORENE                | 86-73-7    | NA                                                  | NA                                          | NA                                         | 880                                                   | 2,000 (S)                                                | 12                                                             | 19                                                   | 110                                                | 140                                                        | NA                           | --      | NA              | --      | NA              | --      | NA                 | --      | NA                 | --      | NA              | --      | NA                | --      | NA                | --      | NA              | --      | NA               | --      |
| PHENANTHRENE            | 85-01-8    | NA                                                  | NA                                          | NA                                         | 52                                                    | 150                                                      | 2.0                                                            | 2.3                                                  | 31                                                 | ID*                                                        | NA                           | --      | NA              | --      | NA              | --      | NA                 | --      | NA                 | --      | NA              | --      | NA                | --      | NA                | --      | NA              | --      | NA               | --      |
| PYRENE                  | 129-00-0   | NA                                                  | NA                                          | NA                                         | 140 (S)                                               | 140 (S)                                                  | ID                                                             | 4.6                                                  | 42                                                 | 15                                                         | NA                           | --      | NA              | --      | NA              | --      | NA                 | --      | NA                 | --      | NA              | --      | NA                | --      | NA                | --      | NA              | --      | NA               | --      |
| Organics - VOCs (ug/kg) |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            |                              |         |                 |         |                 |         |                    |         |                    |         |                 |         |                   |         |                   |         |                 |         |                  |         |
| TOLUENE                 | 108-88-3   | 10                                                  | NA                                          | NA                                         | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | NM                           | --      | NM              | --      | NM              | --      | NM                 | --      | NM                 | --      | NM              | --      | NM                | --      | NM                | --      | NM              | --      | NM               | --      |

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 15-1  
Sediment, Pore Water, and Submerged Drum Contents Analytical Results  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code              |            | EPA Region IV<br>Sediment ESVs                      | Sediment Quality<br>Guidelines              |                                            | EGLE Part 201 Groundwater<br>Generic Cleanup Criteria |                                                          |                                                                | EPA Region IV<br>Surface Water ESVs                  |                                                    | EGLE Rule 57<br>Water Quality Values                       | Sediment - Ripley Waterfront |         |                     |         |                   |         |                  |         |                 |         |                 |         |                 |         | Sediment - Dollar Bay |         |                |         |                |         |                 |         |
|----------------------------|------------|-----------------------------------------------------|---------------------------------------------|--------------------------------------------|-------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------------|------------------------------------------------------|----------------------------------------------------|------------------------------------------------------------|------------------------------|---------|---------------------|---------|-------------------|---------|------------------|---------|-----------------|---------|-----------------|---------|-----------------|---------|-----------------------|---------|----------------|---------|----------------|---------|-----------------|---------|
| Station Name               | CAS Number | [1]<br>Region IV<br>ESV -<br>Freshwater<br>Sediment | [2]<br>Threshold<br>Effect<br>Concentration | [3]<br>Probable<br>Effect<br>Concentration | [GW1]<br>Residential<br>Drinking<br>Water<br>Criteria | [GW2]<br>Nonresidential<br>Drinking<br>Water<br>Criteria | [GW3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [SW1]<br>Region IV<br>Freshwater<br>ESV -<br>Chronic | [SW2]<br>Region IV<br>Freshwater<br>ESV -<br>Acute | [SW3]<br>Rule 57<br>Human<br>Noncancer<br>Value -<br>Drink | QMCP-SD06                    |         |                     |         |                   |         | QMCP-SD07        |         | QMCP-SD08       |         |                 |         | QMCP-SS61       |         | QMCP-SS62             |         | QMCP-SD09      |         | QMCP-SD10      |         |                 |         |
| Sample ID                  |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            | QMCP-SD 06-0-15"             |         | QMCP-SD 06-0-15" FD |         | QMCP-SD 06-15-35" |         | QMCP-SD 07-0-11" |         | QMCP-SD 08-0-8" |         | QMCP-SD08-8-20" |         | QMCP-SS61-0-3in |         | QMCP-SS62-0-3in       |         | QMCP-SD09-0-6" |         | QMCP-SD10-0-4" |         | QMCP-SD10-4-11" |         |
| Sample Date                |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            | 9/5/2018                     |         | 9/5/2018            |         | 9/5/2018          |         | 9/5/2018         |         | 9/5/2018        |         | 9/5/2018        |         | 9/28/2018       |         | 9/28/2018             |         | 9/6/2018       |         | 9/6/2018       |         | 9/6/2018        |         |
| Sample Interval (bgs)      |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            | 0 - 1.25 ft                  |         | 0 - 1.25 ft         |         | 1.25 - 2.9 ft     |         | 0 - 0.92 ft      |         | 0 - 0.667 ft    |         | 0.87 - 1.67 ft  |         | 0 - 0.25 ft     |         | 0 - 0.25 ft           |         | 0 - 0.5 ft     |         | 0 - 0.333 ft   |         | 0.333 - 0.92 ft |         |
| Sample Description         |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            | --                           |         | --                  |         | --                |         | --               |         | --              |         | --              |         | --              |         | --                    |         | --             |         | --             |         | --              |         |
|                            |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            | Result                       | Exceeds | Result              | Exceeds | Result            | Exceeds | Result           | Exceeds | Result          | Exceeds | Result          | Exceeds | Result          | Exceeds | Result                | Exceeds | Result         | Exceeds | Result         | Exceeds | Result          | Exceeds |
| Inorganics- Metals (mg/kg) |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            |                              |         |                     |         |                   |         |                  |         |                 |         |                 |         |                 |         |                       |         |                |         |                |         |                 |         |
| ARSENIC                    | 7440-38-2  | 9.8                                                 | 9.79                                        | 33                                         | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | 1.2                          | --      | 1.4                 | --      | 1.1               | --      | 3.3              | --      | 7.4             | --      | 1               | --      | NM              | --      | NM                    | --      | 22             | [1,2]   | 4.1            | --      | 2.5             | --      |
| CADMIUM                    | 7440-43-9  | 1                                                   | 0.99                                        | 4.98                                       | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | <0.2 U                       | --      | <0.2 U              | --      | <0.2 U            | --      | 0.2              | --      | 0.4             | --      | 0.3             | --      | NM              | --      | NM                    | --      | <0.2 U         | --      | <0.2 U         | --      | <0.2 U          | --      |
| CHROMIUM                   | 7440-47-3  | 43.4                                                | 43.4                                        | 111                                        | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | 9.5                          | --      | 12                  | --      | 12                | --      | 18               | --      | 32              | --      | 23              | --      | NM              | --      | NM                    | --      | 27             | --      | 11             | --      | 13              | --      |
| COPPER                     | 7440-50-8  | 31.6                                                | 31.6                                        | 149                                        | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | 340                          | [1,2,3] | 420                 | [1,2,3] | 2,300             | [1,2,3] | 1,700            | [1,2,3] | 1,100           | [1,2,3] | 2,200           | [1,2,3] | NM              | --      | NM                    | --      | 5,300          | [1,2,3] | 4,100          | [1,2,3] | 1,500           | [1,2,3] |
| LEAD                       | 7439-92-1  | 35.8                                                | 35.8                                        | 128                                        | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | 10                           | --      | 15                  | --      | 16                | --      | 26               | --      | 65              | [1,2]   | 6.5             | --      | NM              | --      | NM                    | --      | 33             | --      | 7.6            | --      | 3.6             | --      |
| MANGANESE                  | 7439-96-5  | 460                                                 | NA                                          | NA                                         | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | 160                          | --      | 240                 | --      | 390               | --      | 510              | [1]     | 360             | --      | 590             | [1]     | NM              | --      | NM                    | --      | 200            | --      | 100            | --      | 78              | --      |
| MERCURY                    | 7439-97-6  | 0.18                                                | 0.18                                        | 1.06                                       | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | <0.06 U                      | --      | <0.06 U             | --      | 0.2               | [1,2]   | 0.1              | --      | 0.6             | [1,2]   | 0.3             | [1,2]   | NM              | --      | NM                    | --      | 0.1            | --      | <0.09 U        | --      | <0.07 U         | --      |
| SILVER                     | 7440-22-4  | 1                                                   | NA                                          | NA                                         | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | 0.4                          | --      | 0.8                 | --      | 4.2               | [1]     | 2.8              | [1]     | 2               | [1]     | 4.3             | [1]     | NM              | --      | NM                    | --      | 3              | [1]     | 0.4            | --      | 0.2             | --      |
| ZINC                       | 7440-66-6  | 121                                                 | 121                                         | 459                                        | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | 26                           | --      | 40                  | --      | 61                | --      | 100              | --      | 97              | --      | 73              | --      | NM              | --      | NM                    | --      | 72             | --      | 20             | --      | 12              | --      |
| Inorganics - Metals (ug/l) |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            |                              |         |                     |         |                   |         |                  |         |                 |         |                 |         |                 |         |                       |         |                |         |                |         |                 |         |
| ARSENIC                    | 7440-38-2  | NA                                                  | NA                                          | NA                                         | 10 (A)                                                | 10 (A)                                                   | 10                                                             | 150 ^                                                | 340 ^                                              | 10                                                         | NA                           | --      | NA                  | --      | NA                | --      | NA               | --      | NA              | --      | NA              | --      | NA              | --      | NA                    | --      | NA             | --      | NA             | --      | NA              | --      |
| BARIUM                     | 7440-39-3  | NA                                                  | NA                                          | NA                                         | 2,000 (A,B)                                           | 2,000 (A,B)                                              | 200 (B,G)                                                      | 220                                                  | 2,000                                              | 1,900                                                      | NA                           | --      | NA                  | --      | NA                | --      | NA               | --      | NA              | --      | NA              | --      | NA              | --      | NA                    | --      | NA             | --      | NA             | --      | NA              | --      |
| CHROMIUM                   | 7440-47-3  | NA                                                  | NA                                          | NA                                         | 100 (A,B,H)                                           | 100 (A,B,H)                                              | 40 (B,G,H,X)                                                   | NA                                                   | NA                                                 | 120                                                        | NA                           | --      | NA                  | --      | NA                | --      | NA               | --      | NA              | --      | NA              | --      | NA              | --      | NA                    | --      | NA             | --      | NA             | --      | NA              | --      |
| COPPER                     | 7440-50-8  | NA                                                  | NA                                          | NA                                         | 1,000 (B,E)                                           | 1,000 (B,E)                                              | 4.7 (B,G)                                                      | 4.94 ^ *                                             | 6.94 ^ *                                           | 470                                                        | NA                           | --      | NA                  | --      | NA                | --      | NA               | --      | NA              | --      | NA              | --      | NA              | --      | NA                    | --      | NA             | --      | NA             | --      | NA              | --      |
| LEAD                       | 7439-92-1  | NA                                                  | NA                                          | NA                                         | 4.0 (B,L)                                             | 4.0 (B,L)                                                | 14 (B,G,X)                                                     | 1.23 ^ *                                             | 31.6 ^ *                                           | 14                                                         | NA                           | --      | NA                  | --      | NA                | --      | NA               | --      | NA              | --      | NA              | --      | NA              | --      | NA                    | --      | NA             | --      | NA             | --      | NA              | --      |
| MANGANESE                  | 7439-96-5  | NA                                                  | NA                                          | NA                                         | 50 (B,E)                                              | 50 (B,E)                                                 | 1,000 (B,G,X)                                                  | 93                                                   | 1,680                                              | 1,300                                                      | NA                           | --      | NA                  | --      | NA                | --      | NA               | --      | NA              | --      | NA              | --      | NA              | --      | NA                    | --      | NA             | --      | NA             | --      | NA              | --      |
| SILVER                     | 7440-22-4  | NA                                                  | NA                                          | NA                                         | 34 (B)                                                | 98 (B)                                                   | 0.2 (B,M)                                                      | 0.06 ^ *                                             | 1.05 ^ *                                           | 130                                                        | NA                           | --      | NA                  | --      | NA                | --      | NA               | --      | NA              | --      | NA              | --      | NA              | --      | NA                    | --      | NA             | --      | NA             | --      | NA              | --      |
| ZINC                       | 7440-66-6  | NA                                                  | NA                                          | NA                                         | 2,400 (B)                                             | 5,000 (B,E)                                              | 63 (B,G)                                                       | 64 ^ *                                               | 64 ^ *                                             | 3,300                                                      | NA                           | --      | NA                  | --      | NA                | --      | NA               | --      | NA              | --      | NA              | --      | NA              | --      | NA                    | --      | NA             | --      | NA             | --      | NA              | --      |
| Organics- PCBs (ug/kg)     |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            |                              |         |                     |         |                   |         |                  |         |                 |         |                 |         |                 |         |                       |         |                |         |                |         |                 |         |
| TOTAL PCBs                 | 1336-36-3  | 59.8                                                | 59.8                                        | 676                                        | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | ND                           | --      | ND                  | --      | ND                | --      | ND               | --      | ND              | --      | ND              | --      | ND              | --      | ND                    | --      | ND             | --      | ND             | --      | ND              | --      |
| Organics - PCBs (ug/l)     |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            |                              |         |                     |         |                   |         |                  |         |                 |         |                 |         |                 |         |                       |         |                |         |                |         |                 |         |
| TOTAL PCBs                 | 1336-36-6  | NA                                                  | NA                                          | NA                                         | 0.5 (A,J,T)                                           | 0.5 (A,J,T)                                              | 0.2 (J,M,T)                                                    | 0.014                                                | 0.014                                              | NLS (#,@)                                                  | NA                           | --      | NA                  | --      | NA                | --      | NA               | --      | NA              | --      | NA              | --      | NA              | --      | NA                    | --      | NA             | --      | NA             | --      | NA              | --      |

Note: Analytical and Criteria Footnotes are included on the last page of the table.



TABLE 15-1  
Sediment, Pore Water, and Submerged Drum Contents Analytical Results  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code           |            | EPA Region IV<br>Sediment ESVs                      | Sediment Quality<br>Guidelines              |                                            | EGLE Part 201 Groundwater<br>Generic Cleanup Criteria |                                                          |                                                                | EPA Region IV<br>Surface Water ESVs                  |                                                    | EGLE Rule 57<br>Water Quality Values                       | Sediment - Ripley Waterfront |         |                     |         |                   |         |                  |         |                 |         |                 |         |                 |         | Sediment - Dollar Bay |         |                |         |                |         |                 |         |
|-------------------------|------------|-----------------------------------------------------|---------------------------------------------|--------------------------------------------|-------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------------|------------------------------------------------------|----------------------------------------------------|------------------------------------------------------------|------------------------------|---------|---------------------|---------|-------------------|---------|------------------|---------|-----------------|---------|-----------------|---------|-----------------|---------|-----------------------|---------|----------------|---------|----------------|---------|-----------------|---------|
| Station Name            | CAS Number | [1]<br>Region IV<br>ESV -<br>Freshwater<br>Sediment | [2]<br>Threshold<br>Effect<br>Concentration | [3]<br>Probable<br>Effect<br>Concentration | [GW1]<br>Residential<br>Drinking<br>Water<br>Criteria | [GW2]<br>Nonresidential<br>Drinking<br>Water<br>Criteria | [GW3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [SW1]<br>Region IV<br>Freshwater<br>ESV -<br>Chronic | [SW2]<br>Region IV<br>Freshwater<br>ESV -<br>Acute | [SW3]<br>Rule 57<br>Human<br>Noncancer<br>Value -<br>Drink | QMCP-SD06                    |         |                     |         |                   |         | QMCP-SD07        |         | QMCP-SD08       |         |                 |         | QMCP-SS61       |         | QMCP-SS62             |         | QMCP-SD09      |         | QMCP-SD10      |         |                 |         |
| Sample ID               |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            | QMCP-SD 06-0-15"             |         | QMCP-SD 06-0-15" FD |         | QMCP-SD 06-15-35" |         | QMCP-SD 07-0-11" |         | QMCP-SD 08-0-8" |         | QMCP-SD08-8-20" |         | QMCP-SS61-0-3in |         | QMCP-SS62-0-3in       |         | QMCP-SD09-0-6" |         | QMCP-SD10-0-4" |         | QMCP-SD10-4-11" |         |
| Sample Date             |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            | 9/5/2018                     |         | 9/5/2018            |         | 9/5/2018          |         | 9/5/2018         |         | 9/5/2018        |         | 9/5/2018        |         | 9/28/2018       |         | 9/28/2018             |         | 9/6/2018       |         | 9/6/2018       |         | 9/6/2018        |         |
| Sample Interval (bgs)   |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            | 0 - 1.25 ft                  |         | 0 - 1.25 ft         |         | 1.25 - 2.9 ft     |         | 0 - 0.92 ft      |         | 0 - 0.667 ft    |         | 0.87 - 1.67 ft  |         | 0 - 0.25 ft     |         | 0 - 0.25 ft           |         | 0 - 0.5 ft     |         | 0 - 0.333 ft   |         | 0.333 - 0.92 ft |         |
| Sample Description      |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            | --                           |         | --                  |         | --                |         | --               |         | --              |         | --              |         | --              |         | --                    |         | --             |         | --             |         | --              |         |
|                         |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            | Result                       | Exceeds | Result              | Exceeds | Result            | Exceeds | Result           | Exceeds | Result          | Exceeds | Result          | Exceeds | Result          | Exceeds | Result                | Exceeds | Result         | Exceeds | Result         | Exceeds | Result          | Exceeds |
| Organics- SVOCs (ug/kg) |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            |                              |         |                     |         |                   |         |                  |         |                 |         |                 |         |                 |         |                       |         |                |         |                |         |                 |         |
| ACENAPHTHENE            | 83-32-9    | 6.7                                                 | NA                                          | NA                                         | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | <250 U                       | --      | <250 U              | --      | 330               | [1]     | <260 U           | --      | <630 U          | --      | <280 U          | --      | <350 U          | --      | <360 U                | --      | <310 U         | --      | <360 U         | --      | <280 U          | --      |
| ACENAPHTHYLENE          | 208-96-8   | 5.9                                                 | NA                                          | NA                                         | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | <250 U                       | --      | <250 U              | --      | <250 U            | --      | <260 U           | --      | <630 U          | --      | <280 U          | --      | <350 U          | --      | 570                   | [1]     | <310 U         | --      | <360 U         | --      | <280 U          | --      |
| ANTHRACENE              | 120-12-7   | 57                                                  | 57.2                                        | 845                                        | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | <250 U                       | --      | <250 U              | --      | 310               | [1,2]   | <260 U           | --      | <630 U          | --      | <280 U          | --      | <350 U          | --      | 750                   | [1,2]   | <310 U         | --      | <360 U         | --      | <280 U          | --      |
| BENZO(A)ANTHRACENE      | 56-55-3    | 108                                                 | 108                                         | 1,050                                      | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | <250 U                       | --      | <250 U              | --      | 520               | [1,2]   | 300              | [1,2]   | <630 U          | --      | <280 U          | --      | 700             | [1,2]   | 3,900                 | [1,2,3] | 970            | [1,2]   | <360 U         | --      | <280 U          | --      |
| BENZO(A)PYRENE          | 50-32-8    | 150                                                 | 150                                         | 1,450                                      | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | <510 U                       | --      | <500 U              | --      | <500 U            | --      | <530 U           | --      | <1300 U         | --      | <550 U          | --      | 700             | [1,2]   | <7300 U               | --      | 1,000          | [1,2]   | <710 U         | --      | <560 U          | --      |
| BENZO(B)FLUORANTHENE    | 205-99-2   | 190                                                 | NA                                          | NA                                         | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | <510 U                       | --      | <500 U              | --      | 600               | [1]     | <530 U           | --      | <1300 U         | --      | <550 U          | --      | 1,400           | [1]     | <7300 U               | --      | 1,900          | [1]     | <710 U         | --      | <560 U          | --      |
| BENZO(K)FLUORANTHENE    | 207-08-9   | 240                                                 | NA                                          | NA                                         | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | <510 U                       | --      | <500 U              | --      | <500 U            | --      | <530 U           | --      | <1300 U         | --      | <550 U          | --      | <690 U          | --      | <7300 U               | --      | 600 J          | [1]     | <710 U         | --      | <560 U          | --      |
| CHRYSENE                | 218-01-9   | 166                                                 | 166                                         | 1,290                                      | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | <250 U                       | --      | <250 U              | --      | 460               | [1,2]   | 290              | [1,2]   | <630 U          | --      | <280 U          | --      | 680             | [1,2]   | 3,600                 | [1,2,3] | 1,300          | [1,2,3] | <360 U         | --      | <280 U          | --      |
| FLUORANTHENE            | 206-44-0   | 423                                                 | 423                                         | 2,230                                      | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | 510                          | [1,2]   | <250 U              | --      | 1,300             | [1,2]   | 730              | [1,2]   | 1,200           | [1,2]   | <280 U          | --      | 1,500           | [1,2]   | 8,100                 | [1,2,3] | 3,000          | [1,2,3] | 460            | [1,2]   | <280 U          | --      |
| FLUORENE                | 86-73-7    | 77                                                  | 77.4                                        | 536                                        | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | <250 U                       | --      | <250 U              | --      | 350               | [1,2]   | <260 U           | --      | <630 U          | --      | <280 U          | --      | <350 U          | --      | <360 U                | --      | <310 U         | --      | <360 U         | --      | <280 U          | --      |
| INDENO(1,2,3-CD)PYRENE  | 193-39-5   | 200                                                 | NA                                          | NA                                         | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | <510 U                       | --      | <500 U              | --      | <500 U            | --      | <530 U           | --      | <1300 U         | --      | <550 U          | --      | <690 U          | --      | <7300 U               | --      | <620 U         | --      | <710 U         | --      | <560 U          | --      |
| NAPHTHALENE (SVOC)      | 91-20-3S   | 176                                                 | 176                                         | 561                                        | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | <250 U                       | --      | <250 U              | --      | 360               | [1,2]   | 410              | [1,2]   | 1,100           | [1,2,3] | <280 U          | --      | <350 U          | --      | 560                   | [1,2]   | 330            | [1,2]   | <360 U         | --      | <280 U          | --      |
| PHENANTHRENE            | 85-01-8    | 204                                                 | 204                                         | 1,170                                      | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | 350                          | [1,2]   | <250 U              | --      | 1,400             | [1,2,3] | 510              | [1,2]   | 980             | [1,2]   | <280 U          | --      | 760             | [1,2]   | 2,900                 | [1,2,3] | 2,300          | [1,2,3] | <360 U         | --      | <280 U          | --      |
| PYRENE                  | 129-00-0   | 195                                                 | 195                                         | 1,520                                      | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | 380                          | [1,2]   | <250 U              | --      | 1,000             | [1,2]   | 640              | [1,2]   | 1,100           | [1,2]   | <280 U          | --      | 1,400           | [1,2]   | 8,000                 | [1,2,3] | 2,400          | [1,2,3] | 440            | [1,2]   | <280 U          | --      |
| Organics - SVOCs (ug/l) |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            |                              |         |                     |         |                   |         |                  |         |                 |         |                 |         |                 |         |                       |         |                |         |                |         |                 |         |
| ACENAPHTHENE            | 83-32-9    | NA                                                  | NA                                          | NA                                         | 1,300                                                 | 3,800                                                    | 38                                                             | 15                                                   | 19                                                 | 580                                                        | NA                           | --      | NA                  | --      | NA                | --      | NA               | --      | NA              | --      | NA              | --      | NA              | --      | NA                    | --      | NA             | --      | NA             | --      | NA              | --      |
| ANTHRACENE              | 120-12-7   | NA                                                  | NA                                          | NA                                         | 43 (S)                                                | 43 (S)                                                   | ID                                                             | 0.02                                                 | 0.18                                               | 1,900                                                      | NA                           | --      | NA                  | --      | NA                | --      | NA               | --      | NA              | --      | NA              | --      | NA              | --      | NA                    | --      | NA             | --      | NA             | --      | NA              | --      |
| FLUORANTHENE            | 206-44-0   | NA                                                  | NA                                          | NA                                         | 210 (S)                                               | 210 (S)                                                  | 1.6                                                            | 0.8                                                  | 3.7                                                | 18                                                         | NA                           | --      | NA                  | --      | NA                | --      | NA               | --      | NA              | --      | NA              | --      | NA              | --      | NA                    | --      | NA             | --      | NA             | --      | NA              | --      |
| FLUORENE                | 86-73-7    | NA                                                  | NA                                          | NA                                         | 880                                                   | 2,000 (S)                                                | 12                                                             | 19                                                   | 110                                                | 140                                                        | NA                           | --      | NA                  | --      | NA                | --      | NA               | --      | NA              | --      | NA              | --      | NA              | --      | NA                    | --      | NA             | --      | NA             | --      | NA              | --      |
| PHENANTHRENE            | 85-01-8    | NA                                                  | NA                                          | NA                                         | 52                                                    | 150                                                      | 2.0                                                            | 2.3                                                  | 31                                                 | ID*                                                        | NA                           | --      | NA                  | --      | NA                | --      | NA               | --      | NA              | --      | NA              | --      | NA              | --      | NA                    | --      | NA             | --      | NA             | --      | NA              | --      |
| PYRENE                  | 129-00-0   | NA                                                  | NA                                          | NA                                         | 140 (S)                                               | 140 (S)                                                  | ID                                                             | 4.6                                                  | 42                                                 | 15                                                         | NA                           | --      | NA                  | --      | NA                | --      | NA               | --      | NA              | --      | NA              | --      | NA              | --      | NA                    | --      | NA             | --      | NA             | --      | NA              | --      |
| Organics - VOCs (ug/kg) |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            |                              |         |                     |         |                   |         |                  |         |                 |         |                 |         |                 |         |                       |         |                |         |                |         |                 |         |
| TOLUENE                 | 108-88-3   | 10                                                  | NA                                          | NA                                         | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | NM                           | --      | NM                  | --      | NM                | --      | NM               | --      | NM              | --      | NM              | --      | <140 U          | --      | 280 J                 | [1]     | NM             | --      | NM             | --      | NM              | --      |

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 15-1  
Sediment, Pore Water, and Submerged Drum Contents Analytical Results  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code              |            | EPA Region IV<br>Sediment ESVs                      | Sediment Quality<br>Guidelines              |                                            | EGLE Part 201 Groundwater<br>Generic Cleanup Criteria |                                                          |                                                                | EPA Region IV<br>Surface Water ESVs                  |                                                    | EGLE Rule 57<br>Water Quality Values                       | Sediment - Dollar Bay |         |                     |         |                |         |                  |         |                   |         |                 |         |                  |         |                  |         | Submerged Drum Contents - Ripley Waterfront |         |            |            |            |         |            |         |        |
|----------------------------|------------|-----------------------------------------------------|---------------------------------------------|--------------------------------------------|-------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------------|------------------------------------------------------|----------------------------------------------------|------------------------------------------------------------|-----------------------|---------|---------------------|---------|----------------|---------|------------------|---------|-------------------|---------|-----------------|---------|------------------|---------|------------------|---------|---------------------------------------------|---------|------------|------------|------------|---------|------------|---------|--------|
| Station Name               | CAS Number | [1]<br>Region IV<br>ESV -<br>Freshwater<br>Sediment | [2]<br>Threshold<br>Effect<br>Concentration | [3]<br>Probable<br>Effect<br>Concentration | [GW1]<br>Residential<br>Drinking<br>Water<br>Criteria | [GW2]<br>Nonresidential<br>Drinking<br>Water<br>Criteria | [GW3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [SW1]<br>Region IV<br>Freshwater<br>ESV -<br>Chronic | [SW2]<br>Region IV<br>Freshwater<br>ESV -<br>Acute | [SW3]<br>Rule 57<br>Human<br>Noncancer<br>Value -<br>Drink | QMCP-SD11             |         |                     |         |                |         | QMCP-SD12        |         |                   |         | QMCP-SD13       |         |                  |         | QMCP-SD14        |         |                                             |         | QMCP-SDM01 |            | QMCP-SDM02 |         | QMCP-SDM03 |         |        |
| Sample ID                  |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            | QMCP-SD 11-6-12"      |         | QMCP-SD 11-6-12" FD |         | QMCP-SD11-0-6" |         | QMCP-SD 12-0-12" |         | QMCP-SD 12-12-23" |         | QMCP-SD 13-0-7" |         | QMCP-SD 13-7-38" |         | QMCP-SD 14-0-12" |         | QMCP-SD 14-12-36"                           |         | QMCP-SDM01 | QMCP-SDM02 | QMCP-SDM03 |         |            |         |        |
| Sample Date                |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            | 9/6/2018              |         | 9/6/2018            |         | 9/6/2018       |         | 9/6/2018         |         | 9/6/2018          |         | 9/7/2018        |         | 9/7/2018         |         | 9/7/2018         |         | 9/7/2018                                    |         | 9/9/2018   | 9/9/2018   | 9/9/2018   |         |            |         |        |
| Sample Interval (bgs)      |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            | 0.5 - 1 ft            |         | 0.5 - 1 ft          |         | 0 - 0.5 ft     |         | 0 - 1 ft         |         | 1 - 1.92 ft       |         | 0 - 0.58 ft     |         | 0.58 - 3.2 ft    |         | 0 - 1 ft         |         | 1 - 3 ft                                    |         | 12.66 ft   | 14.82 ft   | 14.56 ft   |         |            |         |        |
| Sample Description         |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            | --                    |         | --                  |         | --             |         | --               |         | --                |         | --              |         | --               |         | --               |         | --                                          |         | --         | --         | --         |         |            |         |        |
|                            |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            | Result                | Exceeds | Result              | Exceeds | Result         | Exceeds | Result           | Exceeds | Result            | Exceeds | Result          | Exceeds | Result           | Exceeds | Result           | Exceeds | Result                                      | Exceeds | Result     | Exceeds    | Result     | Exceeds | Result     | Exceeds | Result |
| Inorganics- Metals (mg/kg) |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            |                       |         |                     |         |                |         |                  |         |                   |         |                 |         |                  |         |                  |         |                                             |         |            |            |            |         |            |         |        |
| ARSENIC                    | 7440-38-2  | 9.8                                                 | 9.79                                        | 33                                         | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | 1.5                   | --      | 1.1                 | --      | 1.6            | --      | 3.9              | --      | 4.3               | --      | 16              | [1,2]   | 2.9              | --      | 1.4              | --      | 0.6                                         | --      | 8.4        | --         | 4.5        | --      | 9.8        | [2]     |        |
| CADMIUM                    | 7440-43-9  | 1                                                   | 0.99                                        | 4.98                                       | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | <0.2 U                | --      | <0.2 U              | --      | <0.2 U         | --      | 0.2              | --      | 0.3               | --      | <0.2 U          | --      | 0.4              | --      | <0.2 U           | --      | <0.2 U                                      | --      | 0.5        | --         | 0.3        | --      | 0.5        | --      |        |
| CHROMIUM                   | 7440-47-3  | 43.4                                                | 43.4                                        | 111                                        | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | 5.0 J                 | --      | 4.6 J               | --      | 5.6            | --      | 14               | --      | 17                | --      | 110             | [1,2]   | 10               | --      | 5.0 J            | --      | 4.8 J                                       | --      | 21         | --         | 22         | --      | 26         | --      |        |
| COPPER                     | 7440-50-8  | 31.6                                                | 31.6                                        | 149                                        | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | 5.2                   | --      | 5.1                 | --      | 20             | --      | 100              | [1,2]   | 74                | [1,2]   | 1,400           | [1,2,3] | 67               | [1,2]   | 14               | --      | 6.9                                         | --      | 750        | [1,2,3]    | 1,100      | [1,2,3] | 560        | [1,2,3] |        |
| LEAD                       | 7439-92-1  | 35.8                                                | 35.8                                        | 128                                        | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | 1.1                   | --      | 1.2                 | --      | 3.3            | --      | 2.2              | --      | 1.9               | --      | 17              | --      | 1.2              | --      | 1.4              | --      | <1.0 U                                      | --      | 63         | [1,2]      | 38         | [1,2]   | 89         | [1,2]   |        |
| MANGANESE                  | 7439-96-5  | 460                                                 | NA                                          | NA                                         | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | 29 J                  | --      | 32                  | --      | 97             | --      | 120              | --      | 120               | --      | 230             | --      | 130              | --      | 32               | --      | 31                                          | --      | 470        | [1]        | 480        | [1]     | 350        | --      |        |
| MERCURY                    | 7439-97-6  | 0.18                                                | 0.18                                        | 1.06                                       | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | <0.06 U               | --      | <0.06 U             | --      | <0.06 U        | --      | <0.3 U           | --      | <0.3 U            | --      | <0.1 U          | --      | <0.3 U           | --      | <0.06 U          | --      | <0.06 U                                     | --      | 0.2        | [1,2]      | 0.4        | [1,2]   | 0.3        | [1,2]   |        |
| SILVER                     | 7440-22-4  | 1                                                   | NA                                          | NA                                         | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | <0.1 U                | --      | <0.1 U              | --      | <0.1 U         | --      | 0.1              | --      | 0.2               | --      | 0.4             | --      | 0.1              | --      | <0.1 U           | --      | <0.1 U                                      | --      | 1.5        | [1]        | 2.0        | [1]     | 1.0        | --      |        |
| ZINC                       | 7440-66-6  | 121                                                 | 121                                         | 459                                        | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | 7.2                   | --      | 7.7                 | --      | 11             | --      | 24               | --      | 34                | --      | 180             | [1,2]   | 21               | --      | 6.3              | --      | 5                                           | --      | 91         | --         | 85         | --      | 100        | --      |        |
| Inorganics - Metals (ug/l) |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            |                       |         |                     |         |                |         |                  |         |                   |         |                 |         |                  |         |                  |         |                                             |         |            |            |            |         |            |         |        |
| ARSENIC                    | 7440-38-2  | NA                                                  | NA                                          | NA                                         | 10 (A)                                                | 10 (A)                                                   | 10                                                             | 150 ^                                                | 340 ^                                              | 10                                                         | NA                    | --      | NA                  | --      | NA             | --      | NA               | --      | NA                | --      | NA              | --      | NA               | --      | NA               | --      | NA                                          | --      | NA         | --         | NA         | --      | NA         | --      |        |
| BARIUM                     | 7440-39-3  | NA                                                  | NA                                          | NA                                         | 2,000 (A,B)                                           | 2,000 (A,B)                                              | 200 (B,G)                                                      | 220                                                  | 2,000                                              | 1,900                                                      | NA                    | --      | NA                  | --      | NA             | --      | NA               | --      | NA                | --      | NA              | --      | NA               | --      | NA               | --      | NA                                          | --      | NA         | --         | NA         | --      | NA         | --      |        |
| CHROMIUM                   | 7440-47-3  | NA                                                  | NA                                          | NA                                         | 100 (A,B,H)                                           | 100 (A,B,H)                                              | 40 (B,G,H,X)                                                   | NA                                                   | NA                                                 | 120                                                        | NA                    | --      | NA                  | --      | NA             | --      | NA               | --      | NA                | --      | NA              | --      | NA               | --      | NA               | --      | NA                                          | --      | NA         | --         | NA         | --      | NA         | --      |        |
| COPPER                     | 7440-50-8  | NA                                                  | NA                                          | NA                                         | 1,000 (B,E)                                           | 1,000 (B,E)                                              | 4.7 (B,G)                                                      | 4.94 ^ *                                             | 6.94 ^ *                                           | 470                                                        | NA                    | --      | NA                  | --      | NA             | --      | NA               | --      | NA                | --      | NA              | --      | NA               | --      | NA               | --      | NA                                          | --      | NA         | --         | NA         | --      | NA         | --      |        |
| LEAD                       | 7439-92-1  | NA                                                  | NA                                          | NA                                         | 4.0 (B,L)                                             | 4.0 (B,L)                                                | 14 (B,G,X)                                                     | 1.23 ^ *                                             | 31.6 ^ *                                           | 14                                                         | NA                    | --      | NA                  | --      | NA             | --      | NA               | --      | NA                | --      | NA              | --      | NA               | --      | NA               | --      | NA                                          | --      | NA         | --         | NA         | --      | NA         | --      |        |
| MANGANESE                  | 7439-96-5  | NA                                                  | NA                                          | NA                                         | 50 (B,E)                                              | 50 (B,E)                                                 | 1,000 (B,G,X)                                                  | 93                                                   | 1,680                                              | 1,300                                                      | NA                    | --      | NA                  | --      | NA             | --      | NA               | --      | NA                | --      | NA              | --      | NA               | --      | NA               | --      | NA                                          | --      | NA         | --         | NA         | --      | NA         | --      |        |
| SILVER                     | 7440-22-4  | NA                                                  | NA                                          | NA                                         | 34 (B)                                                | 98 (B)                                                   | 0.2 (B,M)                                                      | 0.06 ^ *                                             | 1.05 ^ *                                           | 130                                                        | NA                    | --      | NA                  | --      | NA             | --      | NA               | --      | NA                | --      | NA              | --      | NA               | --      | NA               | --      | NA                                          | --      | NA         | --         | NA         | --      | NA         | --      |        |
| ZINC                       | 7440-66-6  | NA                                                  | NA                                          | NA                                         | 2,400 (B)                                             | 5,000 (B,E)                                              | 63 (B,G)                                                       | 64 ^ *                                               | 64 ^ *                                             | 3,300                                                      | NA                    | --      | NA                  | --      | NA             | --      | NA               | --      | NA                | --      | NA              | --      | NA               | --      | NA               | --      | NA                                          | --      | NA         | --         | NA         | --      | NA         | --      |        |
| Organics- PCBs (ug/kg)     |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            |                       |         |                     |         |                |         |                  |         |                   |         |                 |         |                  |         |                  |         |                                             |         |            |            |            |         |            |         |        |
| TOTAL PCBS                 | 1336-36-3  | 59.8                                                | 59.8                                        | 676                                        | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | ND                    | --      | ND                  | --      | ND             | --      | ND               | --      | ND                | --      | ND              | --      | ND               | --      | ND               | --      | ND                                          | --      | ND         | --         | ND         | --      | ND         | --      |        |
| Organics - PCBs (ug/l)     |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            |                       |         |                     |         |                |         |                  |         |                   |         |                 |         |                  |         |                  |         |                                             |         |            |            |            |         |            |         |        |
| TOTAL PCBS                 | 1336-36-6  | NA                                                  | NA                                          | NA                                         | 0.5 (A,J,T)                                           | 0.5 (A,J,T)                                              | 0.2 (J,M,T)                                                    | 0.014                                                | 0.014                                              | NLS (#,@)                                                  | NA                    | --      | NA                  | --      | NA             | --      | NA               | --      | NA                | --      | NA              | --      | NA               | --      | NA               | --      | NA                                          | --      | NA         | --         | NA         | --      | NA         | --      |        |

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 15-1  
Sediment, Pore Water, and Submerged Drum Contents Analytical Results  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code           |            | EPA Region IV<br>Sediment ESVs                      | Sediment Quality<br>Guidelines              |                                            | EGLE Part 201 Groundwater<br>Generic Cleanup Criteria |                                                          |                                                                | EPA Region IV<br>Surface Water ESVs                  |                                                    | EGLE Rule 57<br>Water Quality Values                       | Sediment - Dollar Bay |         |                     |         |                |         |                  |         |                   |         |                 |         |                  |         | Submerged Drum Contents - Ripley Waterfront |         |                   |         |            |         |            |         |            |         |        |
|-------------------------|------------|-----------------------------------------------------|---------------------------------------------|--------------------------------------------|-------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------------|------------------------------------------------------|----------------------------------------------------|------------------------------------------------------------|-----------------------|---------|---------------------|---------|----------------|---------|------------------|---------|-------------------|---------|-----------------|---------|------------------|---------|---------------------------------------------|---------|-------------------|---------|------------|---------|------------|---------|------------|---------|--------|
| Station Name            | CAS Number | [1]<br>Region IV<br>ESV -<br>Freshwater<br>Sediment | [2]<br>Threshold<br>Effect<br>Concentration | [3]<br>Probable<br>Effect<br>Concentration | [GW1]<br>Residential<br>Drinking<br>Water<br>Criteria | [GW2]<br>Nonresidential<br>Drinking<br>Water<br>Criteria | [GW3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [SW1]<br>Region IV<br>Freshwater<br>ESV -<br>Chronic | [SW2]<br>Region IV<br>Freshwater<br>ESV -<br>Acute | [SW3]<br>Rule 57<br>Human<br>Noncancer<br>Value -<br>Drink | QMCP-SD11             |         |                     |         |                |         | QMCP-SD12        |         |                   |         | QMCP-SD13       |         |                  |         | QMCP-SD14                                   |         |                   |         | QMCP-SDM01 |         | QMCP-SDM02 |         | QMCP-SDM03 |         |        |
| Sample ID               |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            | QMCP-SD 11-6-12"      |         | QMCP-SD 11-6-12" FD |         | QMCP-SD11-0-6" |         | QMCP-SD 12-0-12" |         | QMCP-SD 12-12-23" |         | QMCP-SD 13-0-7" |         | QMCP-SD 13-7-38" |         | QMCP-SD 14-0-12"                            |         | QMCP-SD 14-12-36" |         | QMCP-SDM01 |         | QMCP-SDM02 |         | QMCP-SDM03 |         |        |
| Sample Date             |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            | 9/6/2018              |         | 9/6/2018            |         | 9/6/2018       |         | 9/6/2018         |         | 9/6/2018          |         | 9/7/2018        |         | 9/7/2018         |         | 9/7/2018                                    |         | 9/7/2018          |         | 9/9/2018   |         | 9/9/2018   |         | 9/9/2018   |         |        |
| Sample Interval (bgs)   |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            | 0.5 - 1 ft            |         | 0.5 - 1 ft          |         | 0 - 0.5 ft     |         | 0 - 1 ft         |         | 1 - 1.92 ft       |         | 0 - 0.58 ft     |         | 0.58 - 3.2 ft    |         | 0 - 1 ft                                    |         | 1 - 3 ft          |         | 12.66 ft   |         | 14.82 ft   |         | 14.56 ft   |         |        |
| Sample Description      |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            | --                    |         | --                  |         | --             |         | --               |         | --                |         | --              |         | --               |         | --                                          |         | --                |         | --         |         | --         |         | --         |         |        |
|                         |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            | Result                | Exceeds | Result              | Exceeds | Result         | Exceeds | Result           | Exceeds | Result            | Exceeds | Result          | Exceeds | Result           | Exceeds | Result                                      | Exceeds | Result            | Exceeds | Result     | Exceeds | Result     | Exceeds | Result     | Exceeds | Result |
| Organics- SVOCs (ug/kg) |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            |                       |         |                     |         |                |         |                  |         |                   |         |                 |         |                  |         |                                             |         |                   |         |            |         |            |         |            |         |        |
| ACENAPHTHENE            | 83-32-9    | 6.7                                                 | NA                                          | NA                                         | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | <240 U                | --      | <240 U              | --      | <260 U         | --      | <2800 U          | --      | <3200 U           | --      | <420 U          | --      | <1300 U          | --      | <240 U                                      | --      | <240 U            | --      | <2000 U    | --      | <1500 U    | --      | <1600 U    | --      |        |
| ACENAPHTHYLENE          | 208-96-8   | 5.9                                                 | NA                                          | NA                                         | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | <240 U                | --      | <240 U              | --      | <260 U         | --      | <2800 U          | --      | <3200 U           | --      | <420 U          | --      | <1300 U          | --      | <240 U                                      | --      | <240 U            | --      | <2000 U    | --      | <1500 U    | --      | <1600 U    | --      |        |
| ANTHRACENE              | 120-12-7   | 57                                                  | 57.2                                        | 845                                        | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | <240 U                | --      | <240 U              | --      | <260 U         | --      | <2800 U          | --      | <3200 U           | --      | <420 U          | --      | <1300 U          | --      | <240 U                                      | --      | <240 U            | --      | <2000 U    | --      | <1500 U    | --      | <1600 U    | --      |        |
| BENZO(A)ANTHRACENE      | 56-55-3    | 108                                                 | 108                                         | 1,050                                      | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | <240 U                | --      | <240 U              | --      | <260 U         | --      | <2800 U          | --      | <3200 U           | --      | <420 U          | --      | <1300 U          | --      | <240 U                                      | --      | <240 U            | --      | <2000 U    | --      | <1500 U    | --      | <1600 U    | --      |        |
| BENZO(A)PYRENE          | 50-32-8    | 150                                                 | 150                                         | 1,450                                      | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | <480 U                | --      | <480 U              | --      | <510 U         | --      | <5600 U          | --      | <6500 U           | --      | <840 U          | --      | <2500 U          | --      | <470 U                                      | --      | <480 U            | --      | <4000 U    | --      | <2900 U    | --      | <3100 U    | --      |        |
| BENZO(B)FLUORANTHENE    | 205-99-2   | 190                                                 | NA                                          | NA                                         | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | <480 U                | --      | <480 U              | --      | <510 U         | --      | <5600 U          | --      | <6500 U           | --      | <840 U          | --      | <2500 U          | --      | <470 U                                      | --      | <480 U            | --      | <4000 U    | --      | <2900 U    | --      | <3100 U    | --      |        |
| BENZO(K)FLUORANTHENE    | 207-08-9   | 240                                                 | NA                                          | NA                                         | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | <480 U                | --      | <480 U              | --      | <510 U         | --      | <5600 U          | --      | <6500 U           | --      | <840 U          | --      | <2500 U          | --      | <470 U                                      | --      | <480 U            | --      | <4000 U    | --      | <2900 U    | --      | <3100 U    | --      |        |
| CHRYSENE                | 218-01-9   | 166                                                 | 166                                         | 1,290                                      | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | <240 U                | --      | <240 U              | --      | <260 U         | --      | <2800 U          | --      | <3200 U           | --      | <420 U          | --      | <1300 U          | --      | <240 U                                      | --      | <240 U            | --      | <2000 U    | --      | <1500 U    | --      | <1600 U    | --      |        |
| FLUORANTHENE            | 206-44-0   | 423                                                 | 423                                         | 2,230                                      | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | <240 U                | --      | <240 U              | --      | <260 U         | --      | <2800 U          | --      | <3200 U           | --      | <420 U          | --      | <1300 U          | --      | <240 U                                      | --      | <240 U            | --      | <2000 U    | --      | 1,900      | [1,2]   | 1,600      | [1,2]   |        |
| FLUORENE                | 86-73-7    | 77                                                  | 77.4                                        | 536                                        | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | <240 U                | --      | <240 U              | --      | <260 U         | --      | <2800 U          | --      | <3200 U           | --      | <420 U          | --      | <1300 U          | --      | <240 U                                      | --      | <240 U            | --      | <2000 U    | --      | <1500 U    | --      | <1600 U    | --      |        |
| INDENO(1,2,3-CD)PYRENE  | 193-39-5   | 200                                                 | NA                                          | NA                                         | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | <480 U                | --      | <480 U              | --      | <510 U         | --      | <5600 U          | --      | <6500 U           | --      | <840 U          | --      | <2500 U          | --      | <470 U                                      | --      | <480 U            | --      | <4000 U    | --      | <2900 U    | --      | <3100 U    | --      |        |
| NAPHTHALENE (SVOC)      | 91-20-3S   | 176                                                 | 176                                         | 561                                        | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | <240 U                | --      | <240 U              | --      | <260 U         | --      | <2800 U          | --      | <3200 U           | --      | <420 U          | --      | <1300 U          | --      | <240 U                                      | --      | <240 U            | --      | <2000 U    | --      | <1500 U    | --      | <1600 U    | --      |        |
| PHENANTHRENE            | 85-01-8    | 204                                                 | 204                                         | 1,170                                      | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | <240 U                | --      | <240 U              | --      | <260 U         | --      | <2800 U          | --      | <3200 U           | --      | <420 U          | --      | <1300 U          | --      | <240 U                                      | --      | <240 U            | --      | <2000 U    | --      | <1500 U    | --      | <1600 U    | --      |        |
| PYRENE                  | 129-00-0   | 195                                                 | 195                                         | 1,520                                      | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | <240 U                | --      | <240 U              | --      | <260 U         | --      | <2800 U          | --      | <3200 U           | --      | <420 U          | --      | <1300 U          | --      | <240 U                                      | --      | <240 U            | --      | <2000 U    | --      | 1,600      | [1,2,3] | <1600 U    | --      |        |
| Organics - SVOCs (ug/l) |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            |                       |         |                     |         |                |         |                  |         |                   |         |                 |         |                  |         |                                             |         |                   |         |            |         |            |         |            |         |        |
| ACENAPHTHENE            | 83-32-9    | NA                                                  | NA                                          | NA                                         | 1,300                                                 | 3,800                                                    | 38                                                             | 15                                                   | 19                                                 | 580                                                        | NA                    | --      | NA                  | --      | NA             | --      | NA               | --      | NA                | --      | NA              | --      | NA               | --      | NA                                          | --      | NA                | --      | NA         | --      | NA         | --      | NA         | --      |        |
| ANTHRACENE              | 120-12-7   | NA                                                  | NA                                          | NA                                         | 43 (S)                                                | 43 (S)                                                   | ID                                                             | 0.02                                                 | 0.18                                               | 1,900                                                      | NA                    | --      | NA                  | --      | NA             | --      | NA               | --      | NA                | --      | NA              | --      | NA               | --      | NA                                          | --      | NA                | --      | NA         | --      | NA         | --      | NA         | --      |        |
| FLUORANTHENE            | 206-44-0   | NA                                                  | NA                                          | NA                                         | 210 (S)                                               | 210 (S)                                                  | 1.6                                                            | 0.8                                                  | 3.7                                                | 18                                                         | NA                    | --      | NA                  | --      | NA             | --      | NA               | --      | NA                | --      | NA              | --      | NA               | --      | NA                                          | --      | NA                | --      | NA         | --      | NA         | --      | NA         | --      |        |
| FLUORENE                | 86-73-7    | NA                                                  | NA                                          | NA                                         | 880                                                   | 2,000 (S)                                                | 12                                                             | 19                                                   | 110                                                | 140                                                        | NA                    | --      | NA                  | --      | NA             | --      | NA               | --      | NA                | --      | NA              | --      | NA               | --      | NA                                          | --      | NA                | --      | NA         | --      | NA         | --      | NA         | --      |        |
| PHENANTHRENE            | 85-01-8    | NA                                                  | NA                                          | NA                                         | 52                                                    | 150                                                      | 2.0                                                            | 2.3                                                  | 31                                                 | ID*                                                        | NA                    | --      | NA                  | --      | NA             | --      | NA               | --      | NA                | --      | NA              | --      | NA               | --      | NA                                          | --      | NA                | --      | NA         | --      | NA         | --      | NA         | --      |        |
| PYRENE                  | 129-00-0   | NA                                                  | NA                                          | NA                                         | 140 (S)                                               | 140 (S)                                                  | ID                                                             | 4.6                                                  | 42                                                 | 15                                                         | NA                    | --      | NA                  | --      | NA             | --      | NA               | --      | NA                | --      | NA              | --      | NA               | --      | NA                                          | --      | NA                | --      | NA         | --      | NA         | --      | NA         | --      |        |
| Organics - VOCs (ug/kg) |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            |                       |         |                     |         |                |         |                  |         |                   |         |                 |         |                  |         |                                             |         |                   |         |            |         |            |         |            |         |        |
| TOLUENE                 | 108-88-3   | 10                                                  | NA                                          | NA                                         | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | NM                    | --      | NM                  | --      | NM             | --      | NM               | --      | NM                | --      | NM              | --      | NM               | --      | NM                                          | --      | NM                | --      | NM         | --      | NM         | --      | NM         | --      |        |

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 15-1  
Sediment, Pore Water, and Submerged Drum Contents Analytical Results  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code              |            | EPA Region IV<br>Sediment ESVs                      | Sediment Quality<br>Guidelines              |                                            | EGLE Part 201 Groundwater<br>Generic Cleanup Criteria |                                                          |                                                                | EPA Region IV<br>Surface Water ESVs                  |                                                    | EGLE Rule 57<br>Water Quality Values                       | Pore Water - Ripley Waterfront                                                        |                           |                                                                                        |               |                                                                                                |                   |                          |                           |                          |               | Pore Water - Dollar Bay                                                                |               |                                                           |         |
|----------------------------|------------|-----------------------------------------------------|---------------------------------------------|--------------------------------------------|-------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------------|------------------------------------------------------|----------------------------------------------------|------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------|----------------------------------------------------------------------------------------|---------------|------------------------------------------------------------------------------------------------|-------------------|--------------------------|---------------------------|--------------------------|---------------|----------------------------------------------------------------------------------------|---------------|-----------------------------------------------------------|---------|
| Station Name               | CAS Number | [1]<br>Region IV<br>ESV -<br>Freshwater<br>Sediment | [2]<br>Threshold<br>Effect<br>Concentration | [3]<br>Probable<br>Effect<br>Concentration | [GW1]<br>Residential<br>Drinking<br>Water<br>Criteria | [GW2]<br>Nonresidential<br>Drinking<br>Water<br>Criteria | [GW3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [SW1]<br>Region IV<br>Freshwater<br>ESV -<br>Chronic | [SW2]<br>Region IV<br>Freshwater<br>ESV -<br>Acute | [SW3]<br>Rule 57<br>Human<br>Noncancer<br>Value -<br>Drink | QMCP-PS02                                                                             |                           | QMCP-PS04                                                                              |               | QMCP-PS05                                                                                      |                   | QMCP-PS06                |                           | QMCP-PS07                |               | QMCP-PS10                                                                              |               | QMCP-PS45                                                 |         |
| Sample ID                  |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            | QMCP PS02                                                                             |                           | QMCP-PS04                                                                              |               | QMCP PS05                                                                                      |                   | QMCP PS06                |                           | QMCP PS07                |               | QMCP-PS10                                                                              |               | QMCP-PS45                                                 |         |
| Sample Date                |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            | 9/6/2018                                                                              |                           | 9/10/2018                                                                              |               | 9/6/2018                                                                                       |                   | 9/6/2018                 |                           | 9/6/2018                 |               | 9/10/2018                                                                              |               | 9/10/2018                                                 |         |
| Sample Interval (bgs)      |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            | --                                                                                    |                           | --                                                                                     |               | --                                                                                             |                   | --                       |                           | --                       |               | --                                                                                     |               | --                                                        |         |
| Sample Description         |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            | Collected near QMCP-SD02 where sediments indicated signs of contamination (oily odor) |                           | Collected near QMCP-SD04 where sediments indicated signs of contamination (oily sheen) |               | Collected near QMCP-SD05 where sediments indicated signs of contamination (strong sulfur odor) |                   | Collected near QMCP-SD06 |                           | Collected near QMCP-SD07 |               | Collected near QMCP-SD10 where sediments indicated signs of contamination (oily sheen) |               | Collected offshore of terrestrial location QMCP-SB45/GW45 |         |
|                            |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            | Result                                                                                | Exceeds                   | Result                                                                                 | Exceeds       | Result                                                                                         | Exceeds           | Result                   | Exceeds                   | Result                   | Exceeds       | Result                                                                                 | Exceeds       | Result                                                    | Exceeds |
| Inorganics- Metals (mg/kg) |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            |                                                                                       |                           |                                                                                        |               |                                                                                                |                   |                          |                           |                          |               |                                                                                        |               |                                                           |         |
| ARSENIC                    | 7440-38-2  | 9.8                                                 | 9.79                                        | 33                                         | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | NA                                                                                    | --                        | NA                                                                                     | --            | NA                                                                                             | --                | NA                       | --                        | NA                       | --            | NA                                                                                     | --            | NA                                                        | --      |
| CADMIUM                    | 7440-43-9  | 1                                                   | 0.99                                        | 4.98                                       | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | NA                                                                                    | --                        | NA                                                                                     | --            | NA                                                                                             | --                | NA                       | --                        | NA                       | --            | NA                                                                                     | --            | NA                                                        | --      |
| CHROMIUM                   | 7440-47-3  | 43.4                                                | 43.4                                        | 111                                        | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | NA                                                                                    | --                        | NA                                                                                     | --            | NA                                                                                             | --                | NA                       | --                        | NA                       | --            | NA                                                                                     | --            | NA                                                        | --      |
| COPPER                     | 7440-50-8  | 31.6                                                | 31.6                                        | 149                                        | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | NA                                                                                    | --                        | NA                                                                                     | --            | NA                                                                                             | --                | NA                       | --                        | NA                       | --            | NA                                                                                     | --            | NA                                                        | --      |
| LEAD                       | 7439-92-1  | 35.8                                                | 35.8                                        | 128                                        | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | NA                                                                                    | --                        | NA                                                                                     | --            | NA                                                                                             | --                | NA                       | --                        | NA                       | --            | NA                                                                                     | --            | NA                                                        | --      |
| MANGANESE                  | 7439-96-5  | 460                                                 | NA                                          | NA                                         | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | NA                                                                                    | --                        | NA                                                                                     | --            | NA                                                                                             | --                | NA                       | --                        | NA                       | --            | NA                                                                                     | --            | NA                                                        | --      |
| MERCURY                    | 7439-97-6  | 0.18                                                | 0.18                                        | 1.06                                       | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | NA                                                                                    | --                        | NA                                                                                     | --            | NA                                                                                             | --                | NA                       | --                        | NA                       | --            | NA                                                                                     | --            | NA                                                        | --      |
| SILVER                     | 7440-22-4  | 1                                                   | NA                                          | NA                                         | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | NA                                                                                    | --                        | NA                                                                                     | --            | NA                                                                                             | --                | NA                       | --                        | NA                       | --            | NA                                                                                     | --            | NA                                                        | --      |
| ZINC                       | 7440-66-6  | 121                                                 | 121                                         | 459                                        | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | NA                                                                                    | --                        | NA                                                                                     | --            | NA                                                                                             | --                | NA                       | --                        | NA                       | --            | NA                                                                                     | --            | NA                                                        | --      |
| Inorganics - Metals (ug/l) |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            |                                                                                       |                           |                                                                                        |               |                                                                                                |                   |                          |                           |                          |               |                                                                                        |               |                                                           |         |
| ARSENIC                    | 7440-38-2  | NA                                                  | NA                                          | NA                                         | 10 (A)                                                | 10 (A)                                                   | 10                                                             | 150 ^                                                | 340 ^                                              | 10                                                         | 3.2                                                                                   | --                        | <1.0 U                                                                                 | --            | <1.0 U                                                                                         | --                | 2.4                      | --                        | 1.3                      | --            | 1.8                                                                                    | --            | NM                                                        | --      |
| BARIUM                     | 7440-39-3  | NA                                                  | NA                                          | NA                                         | 2,000 (A,B)                                           | 2,000 (A,B)                                              | 200 (B,G)                                                      | 220                                                  | 2,000                                              | 1,900                                                      | 8.9                                                                                   | --                        | NM                                                                                     |               | 85                                                                                             | --                | 56                       | --                        | 51                       | --            | NM                                                                                     |               | NM                                                        | --      |
| CHROMIUM                   | 7440-47-3  | NA                                                  | NA                                          | NA                                         | 100 (A,B,H)                                           | 100 (A,B,H)                                              | 40 (B,G,H,X)                                                   | NA                                                   | NA                                                 | 120                                                        | 5.1                                                                                   | --                        | 2.2                                                                                    | --            | 4.2                                                                                            | --                | 7.0                      | --                        | 2.1                      | --            | 5.3                                                                                    | --            | NM                                                        | --      |
| COPPER                     | 7440-50-8  | NA                                                  | NA                                          | NA                                         | 1,000 (B,E)                                           | 1,000 (B,E)                                              | 4.7 (B,G)                                                      | 4.94 ^ *                                             | 6.94 ^ *                                           | 470                                                        | 820                                                                                   | [GW3,SW1,SW2,SW3]         | 420                                                                                    | [GW3,SW1,SW2] | 210                                                                                            | [GW3,SW1,SW2]     | 3,500                    | [GW1,GW2,GW3,SW1,SW2,SW3] | 210                      | [GW3,SW1,SW2] | 250                                                                                    | [GW3,SW1,SW2] | NM                                                        | --      |
| LEAD                       | 7439-92-1  | NA                                                  | NA                                          | NA                                         | 4.0 (B,L)                                             | 4.0 (B,L)                                                | 14 (B,G,X)                                                     | 1.23 ^ *                                             | 31.6 ^ *                                           | 14                                                         | 110                                                                                   | [GW1,GW2,GW3,SW1,SW2,SW3] | 4.4                                                                                    | [GW1,GW2,SW1] | 13                                                                                             | [GW1,GW2,SW1]     | 26                       | [GW1,GW2,GW3,SW1,SW3]     | 5.6                      | [GW1,GW2,SW1] | 2.0                                                                                    | [SW1]         | NM                                                        | --      |
| MANGANESE                  | 7439-96-5  | NA                                                  | NA                                          | NA                                         | 50 (B,E)                                              | 50 (B,E)                                                 | 1,000 (B,G,X)                                                  | 93                                                   | 1,680                                              | 1,300                                                      | 150                                                                                   | [GW1,GW2,SW1]             | 410                                                                                    | [GW1,GW2,SW1] | 1,300                                                                                          | [GW1,GW2,GW3,SW1] | 760                      | [GW1,GW2,SW1]             | 81                       | [GW1,GW2]     | 390                                                                                    | [GW1,GW2,SW1] | NM                                                        | --      |
| SILVER                     | 7440-22-4  | NA                                                  | NA                                          | NA                                         | 34 (B)                                                | 98 (B)                                                   | 0.2 (B,M)                                                      | 0.06 ^ *                                             | 1.05 ^ *                                           | 130                                                        | 0.5                                                                                   | [GW3,SW1]                 | 0.4                                                                                    | [GW3,SW1]     | <0.2 U                                                                                         | --                | 5.3                      | [GW3,SW1,SW2]             | <0.2 U                   | --            | 0.3                                                                                    | [GW3,SW1]     | NM                                                        | --      |
| ZINC                       | 7440-66-6  | NA                                                  | NA                                          | NA                                         | 2,400 (B)                                             | 5,000 (B,E)                                              | 63 (B,G)                                                       | 64 ^ *                                               | 64 ^ *                                             | 3,300                                                      | 50                                                                                    | --                        | 11                                                                                     | --            | 19                                                                                             | --                | 32                       | --                        | 7.4                      | --            | <5.0 U                                                                                 | --            | NM                                                        | --      |
| Organics- PCBs (ug/kg)     |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            |                                                                                       |                           |                                                                                        |               |                                                                                                |                   |                          |                           |                          |               |                                                                                        |               |                                                           |         |
| TOTAL PCBs                 | 1336-36-3  | 59.8                                                | 59.8                                        | 676                                        | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | NA                                                                                    | --                        | NA                                                                                     | --            | NA                                                                                             | --                | NA                       | --                        | NA                       | --            | NA                                                                                     | --            | NA                                                        | --      |
| Organics - PCBs (ug/l)     |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            |                                                                                       |                           |                                                                                        |               |                                                                                                |                   |                          |                           |                          |               |                                                                                        |               |                                                           |         |
| TOTAL PCBs                 | 1336-36-6  | NA                                                  | NA                                          | NA                                         | 0.5 (A,J,T)                                           | 0.5 (A,J,T)                                              | 0.2 (J,M,T)                                                    | 0.014                                                | 0.014                                              | NLS (#,@)                                                  | ND                                                                                    | --                        | ND                                                                                     | --            | ND                                                                                             | --                | ND                       | --                        | ND                       | --            | ND                                                                                     | --            | NM                                                        | --      |

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 15-1  
Sediment, Pore Water, and Submerged Drum Contents Analytical Results  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Location Code           |            | EPA Region IV<br>Sediment ESVs                      | Sediment Quality<br>Guidelines              |                                            | EGLE Part 201 Groundwater<br>Generic Cleanup Criteria |                                                          |                                                                | EPA Region IV<br>Surface Water ESVs                  |                                                    | EGLE Rule 57<br>Water Quality Values                       | Pore Water - Ripley Waterfront                                                        |         |                                                                                        |         |                                                                                                |         |                          |                 |                          |         | Pore Water - Dollar Bay                                                                |         |                                                           |         |
|-------------------------|------------|-----------------------------------------------------|---------------------------------------------|--------------------------------------------|-------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------------|------------------------------------------------------|----------------------------------------------------|------------------------------------------------------------|---------------------------------------------------------------------------------------|---------|----------------------------------------------------------------------------------------|---------|------------------------------------------------------------------------------------------------|---------|--------------------------|-----------------|--------------------------|---------|----------------------------------------------------------------------------------------|---------|-----------------------------------------------------------|---------|
| Station Name            | CAS Number | [1]<br>Region IV<br>ESV -<br>Freshwater<br>Sediment | [2]<br>Threshold<br>Effect<br>Concentration | [3]<br>Probable<br>Effect<br>Concentration | [GW1]<br>Residential<br>Drinking<br>Water<br>Criteria | [GW2]<br>Nonresidential<br>Drinking<br>Water<br>Criteria | [GW3]<br>Groundwater<br>Surface Water<br>Interface<br>Criteria | [SW1]<br>Region IV<br>Freshwater<br>ESV -<br>Chronic | [SW2]<br>Region IV<br>Freshwater<br>ESV -<br>Acute | [SW3]<br>Rule 57<br>Human<br>Noncancer<br>Value -<br>Drink | QMCP-PS02                                                                             |         | QMCP-PS04                                                                              |         | QMCP-PS05                                                                                      |         | QMCP-PS06                |                 | QMCP-PS07                |         | QMCP-PS10                                                                              |         | QMCP-PS45                                                 |         |
| Sample ID               |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            | QMCP PS02                                                                             |         | QMCP-PS04                                                                              |         | QMCP PS05                                                                                      |         | QMCP PS06                |                 | QMCP PS07                |         | QMCP-PS10                                                                              |         | QMCP-PS45                                                 |         |
| Sample Date             |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            | 9/6/2018                                                                              |         | 9/10/2018                                                                              |         | 9/6/2018                                                                                       |         | 9/6/2018                 |                 | 9/6/2018                 |         | 9/10/2018                                                                              |         | 9/10/2018                                                 |         |
| Sample Interval (bgs)   |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            | --                                                                                    |         | --                                                                                     |         | --                                                                                             |         | --                       |                 | --                       |         | --                                                                                     |         | --                                                        |         |
| Sample Description      |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            | Collected near QMCP-SD02 where sediments indicated signs of contamination (oily odor) |         | Collected near QMCP-SD04 where sediments indicated signs of contamination (oily sheen) |         | Collected near QMCP-SD05 where sediments indicated signs of contamination (strong sulfur odor) |         | Collected near QMCP-SD06 |                 | Collected near QMCP-SD07 |         | Collected near QMCP-SD10 where sediments indicated signs of contamination (oily sheen) |         | Collected offshore of terrestrial location QMCP-SB45/GW45 |         |
|                         |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            | Result                                                                                | Exceeds | Result                                                                                 | Exceeds | Result                                                                                         | Exceeds | Result                   | Exceeds         | Result                   | Exceeds | Result                                                                                 | Exceeds | Result                                                    | Exceeds |
| Organics- SVOCs (ug/kg) |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            |                                                                                       |         |                                                                                        |         |                                                                                                |         |                          |                 |                          |         |                                                                                        |         |                                                           |         |
| ACENAPHTHENE            | 83-32-9    | 6.7                                                 | NA                                          | NA                                         | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | NA                                                                                    | --      | NA                                                                                     | --      | NA                                                                                             | --      | NA                       | --              | NA                       | --      | NA                                                                                     | --      | NA                                                        | --      |
| ACENAPHTHYLENE          | 208-96-8   | 5.9                                                 | NA                                          | NA                                         | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | NA                                                                                    | --      | NA                                                                                     | --      | NA                                                                                             | --      | NA                       | --              | NA                       | --      | NA                                                                                     | --      | NA                                                        | --      |
| ANTHRACENE              | 120-12-7   | 57                                                  | 57.2                                        | 845                                        | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | NA                                                                                    | --      | NA                                                                                     | --      | NA                                                                                             | --      | NA                       | --              | NA                       | --      | NA                                                                                     | --      | NA                                                        | --      |
| BENZO(A)ANTHRACENE      | 56-55-3    | 108                                                 | 108                                         | 1,050                                      | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | NA                                                                                    | --      | NA                                                                                     | --      | NA                                                                                             | --      | NA                       | --              | NA                       | --      | NA                                                                                     | --      | NA                                                        | --      |
| BENZO(A)PYRENE          | 50-32-8    | 150                                                 | 150                                         | 1,450                                      | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | NA                                                                                    | --      | NA                                                                                     | --      | NA                                                                                             | --      | NA                       | --              | NA                       | --      | NA                                                                                     | --      | NA                                                        | --      |
| BENZO(B)FLUORANTHENE    | 205-99-2   | 190                                                 | NA                                          | NA                                         | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | NA                                                                                    | --      | NA                                                                                     | --      | NA                                                                                             | --      | NA                       | --              | NA                       | --      | NA                                                                                     | --      | NA                                                        | --      |
| BENZO(K)FLUORANTHENE    | 207-08-9   | 240                                                 | NA                                          | NA                                         | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | NA                                                                                    | --      | NA                                                                                     | --      | NA                                                                                             | --      | NA                       | --              | NA                       | --      | NA                                                                                     | --      | NA                                                        | --      |
| CHRYSENE                | 218-01-9   | 166                                                 | 166                                         | 1,290                                      | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | NA                                                                                    | --      | NA                                                                                     | --      | NA                                                                                             | --      | NA                       | --              | NA                       | --      | NA                                                                                     | --      | NA                                                        | --      |
| FLUORANTHENE            | 206-44-0   | 423                                                 | 423                                         | 2,230                                      | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | NA                                                                                    | --      | NA                                                                                     | --      | NA                                                                                             | --      | NA                       | --              | NA                       | --      | NA                                                                                     | --      | NA                                                        | --      |
| FLUORENE                | 86-73-7    | 77                                                  | 77.4                                        | 536                                        | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | NA                                                                                    | --      | NA                                                                                     | --      | NA                                                                                             | --      | NA                       | --              | NA                       | --      | NA                                                                                     | --      | NA                                                        | --      |
| INDENO(1,2,3-CD)PYRENE  | 193-39-5   | 200                                                 | NA                                          | NA                                         | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | NA                                                                                    | --      | NA                                                                                     | --      | NA                                                                                             | --      | NA                       | --              | NA                       | --      | NA                                                                                     | --      | NA                                                        | --      |
| NAPHTHALENE (SVOC)      | 91-20-3S   | 176                                                 | 176                                         | 561                                        | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | NA                                                                                    | --      | NA                                                                                     | --      | NA                                                                                             | --      | NA                       | --              | NA                       | --      | NA                                                                                     | --      | NA                                                        | --      |
| PHENANTHRENE            | 85-01-8    | 204                                                 | 204                                         | 1,170                                      | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | NA                                                                                    | --      | NA                                                                                     | --      | NA                                                                                             | --      | NA                       | --              | NA                       | --      | NA                                                                                     | --      | NA                                                        | --      |
| PYRENE                  | 129-00-0   | 195                                                 | 195                                         | 1,520                                      | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | NA                                                                                    | --      | NA                                                                                     | --      | NA                                                                                             | --      | NA                       | --              | NA                       | --      | NA                                                                                     | --      | NA                                                        | --      |
| Organics - SVOCs (ug/l) |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            |                                                                                       |         |                                                                                        |         |                                                                                                |         |                          |                 |                          |         |                                                                                        |         |                                                           |         |
| ACENAPHTHENE            | 83-32-9    | NA                                                  | NA                                          | NA                                         | 1,300                                                 | 3,800                                                    | 38                                                             | 15                                                   | 19                                                 | 580                                                        | <1.0 U                                                                                | --      | <1.0 U                                                                                 | --      | <1.0 U                                                                                         | --      | 2.8                      | --              | <1.0 U                   | --      | <1.0 U                                                                                 | --      | <1.0 U                                                    | --      |
| ANTHRACENE              | 120-12-7   | NA                                                  | NA                                          | NA                                         | 43 (S)                                                | 43 (S)                                                   | ID                                                             | 0.02                                                 | 0.18                                               | 1,900                                                      | <1.0 U                                                                                | --      | <1.0 U                                                                                 | --      | <1.0 U                                                                                         | --      | 2.3                      | [SW1, SW2]      | <1.0 U                   | --      | <1.0 U                                                                                 | --      | <1.0 U                                                    | --      |
| FLUORANTHENE            | 206-44-0   | NA                                                  | NA                                          | NA                                         | 210 (S)                                               | 210 (S)                                                  | 1.6                                                            | 0.8                                                  | 3.7                                                | 18                                                         | 1.1                                                                                   | [SW1]   | <1.0 U                                                                                 | --      | <1.0 U                                                                                         | --      | 5.1                      | [GW3, SW1, SW2] | <1.0 U                   | --      | <1.0 U                                                                                 | --      | <1.0 U                                                    | --      |
| FLUORENE                | 86-73-7    | NA                                                  | NA                                          | NA                                         | 880                                                   | 2,000 (S)                                                | 12                                                             | 19                                                   | 110                                                | 140                                                        | <1.0 U                                                                                | --      | <1.0 U                                                                                 | --      | <1.0 U                                                                                         | --      | 4.0                      | --              | <1.0 U                   | --      | <1.0 U                                                                                 | --      | <1.0 U                                                    | --      |
| PHENANTHRENE            | 85-01-8    | NA                                                  | NA                                          | NA                                         | 52                                                    | 150                                                      | 2.0                                                            | 2.3                                                  | 31                                                 | ID*                                                        | 1.4                                                                                   | --      | <1.0 U                                                                                 | --      | <1.0 U                                                                                         | --      | 12                       | [GW3, SW1]      | <1.0 U                   | --      | <1.0 U                                                                                 | --      | <1.0 U                                                    | --      |
| PYRENE                  | 129-00-0   | NA                                                  | NA                                          | NA                                         | 140 (S)                                               | 140 (S)                                                  | ID                                                             | 4.6                                                  | 42                                                 | 15                                                         | <1.0 U                                                                                | --      | <1.0 U                                                                                 | --      | <1.0 U                                                                                         | --      | 3.9                      | --              | <1.0 U                   | --      | <1.0 U                                                                                 | --      | <1.0 U                                                    | --      |
| Organics - VOCs (ug/kg) |            |                                                     |                                             |                                            |                                                       |                                                          |                                                                |                                                      |                                                    |                                                            |                                                                                       |         |                                                                                        |         |                                                                                                |         |                          |                 |                          |         |                                                                                        |         |                                                           |         |
| TOLUENE                 | 108-88-3   | 10                                                  | NA                                          | NA                                         | NA                                                    | NA                                                       | NA                                                             | NA                                                   | NA                                                 | NA                                                         | NA                                                                                    | --      | NA                                                                                     | --      | NA                                                                                             | --      | NA                       | --              | NA                       | --      | NA                                                                                     | --      | NA                                                        | --      |

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 15-1

Sediment, Pore Water, and Submerged Drum Contents Analytical Results

Quincy Mining Company Portage Operations Area

Abandoned Mining Wastes - Torch Lake Non-Superfund Site

**Table Footnotes:**

- EGLE Part 201 residential and non-residential generic cleanup criteria and screening levels criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a. Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Release Date: December 30, 2013. Updated December 21, 2020.

- EGLE Rule 57 values derived from the Michigan Department of Environment Great Lakes and Energy, Water Bureau, Water Resources Protection, filed with the Secretary of State on January 13, 2006. Part 4 Water Quality Standards, Rule 323.1057 Toxic Substances, as amended. Updated on August 1, 2019.

- ESVs are adapted from the Environmental Protection Agency Region IV Ecological Risk Assessment Supplemental Guidance, published November 1995, updated March 2018.

- TECs, and PECs are adapted from Appendix A and Appendix B of Michigan Department of Environment, Great Lakes, and Energy (EGLE) - Remediation and Redevelopment Division Operational Memorandum No. 4 Attachment 3, Interim Final August 2, 2006.

- Only detected analytes are listed - Gray rows indicate requested analyses.

- **Bold** values are concentrations detected above the laboratory reporting limit.

- **Bold/Shaded** cells indicate analyte concentration exceeded applicable criteria. Criteria exceeded is indicated by the footnote in [brackets] following the result value and defined below:

|                                                                    |                                                                                          |
|--------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| [1] - EPA Region IV Freshwater Sediment ESV                        | [SW1] - EPA Region IV Surface Water Freshwater ESV - Chronic                             |
| [2] - TECs (MacDonald et al. 2000)                                 | [SW2] - EPA Region IV Surface Water Freshwater ESV - Acute                               |
| [3] - PECs (MacDonald et al.2000)                                  | [SW3] - EGLE Rule 57 Water Quality Value - Human Noncancer Value - Drinking Water Source |
| [GW1] - EGLE Part 201 Residential Drinking Water Criteria          | [SW4] - EGLE Rule 57 Water Quality Value - Human Cancer Value-Drinking Water Source      |
| [GW2] - EGLE Part 201 Nonresidential Drinking Water Criteria       | [SW5] - EGLE Rule 57 Water Quality Value - Wildlife Value                                |
| [GW3] - EGLE Part 201 Groundwater Surface Water Interface Criteria |                                                                                          |

Evaluation based on EGLE Criteria at time of Project completion.

|                                  |                                                     |
|----------------------------------|-----------------------------------------------------|
| -- = No Exceedances              | PCBs = Polychlorinated biphenyls                    |
| NA = Not Applicable              | SVOC = Semi-volatile organic compound               |
| NM = Not Measured                | VOC = Volatile organic compound                     |
| ND = Not Detected                | RBSL = Risk Based Screening Level                   |
| ft = feet                        | EPA = United States Environmental Protection Agency |
| bgs = below ground surface       | ESV = Ecological Screening Value                    |
| ug/l = Micrograms per liter      | PEC = Probable Effect Concentration                 |
| mg/kg = Milligrams per kilogram. | TEC = Threshold Effect Concentration                |
| ug/kg = Micrograms per kilogram  |                                                     |

**EGLE Criteritia Footnotes:**

ID = Insufficient data to develop criterion.

NA = A criterion or value is not available

NLV = Hazardous substance is not likely to volatilize under most conditions.

(A) = Criterion is the state of Michigan drinking water standard established pursuant to Section 5 of 1976 PA 399, MCL 325.1005.

(B) = Background, as defined in R 299.1(b), may be substituted if higher than the calculated cleanup criterion. Background levels may be less than criteria for some inorganic compounds.

(E) = Criterion is the aesthetic drinking water value, as required by Section 20120a(5) of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA). A notice of aesthetic impact may be employed as an institutional control mechanism if groundwater concentrations exceed the aesthetic drinking water criterion, but do not exceed the applicable health-based drinking water value provided in a table available on EGLE internet web site. (See R 299.49 Footnotes for generic cleanup criteria tables for additional information)

(G) = Groundwater surface water interface (GSI) criterion depends on the pH or water hardness, or both, of the receiving surface water. The final chronic value (FCV) for the protection of aquatic life shall be calculated based on the pH or hardness of the receiving surface water. Where water hardness exceeds 400 mg CaCO<sub>3</sub>/L, use 400 mg CaCO<sub>3</sub>/L for the FCV calculation. The FCV formula provides values in units of ug/L or ppb. The generic GSI criterion is the lesser of the calculated FCV, the wildlife value (WV), and the surface water human non-drinking water value (HNDV). The soil GSI protection criteria for these hazardous substances are the greater of the 20 times the GSI criterion or the GSI soil-water partition values using the GSI criteria developed with the procedure described in this footnote. A spreadsheet that may be used to calculate GSI and GSI protection criteria for (G)-footnoted hazardous substances is available on the EGLE internet web site. A hardness value of 47.5 CaCO<sub>3</sub>/L and pH of 7, derived from the Michigan Department of Environmental Quality Draft Site Inspection Report for Lake Linden Operations dated 3/29/13, was used in the footnote G calculation spreadsheet.

(H) = Valence-specific chromium data (Cr III and Cr VI) shall be compared to the corresponding valence-specific cleanup criteria. If both Cr III and Cr VI are present in groundwater, the total concentration of both cannot exceed the drinking water criterion of 100 ug/L. If analytical data are provided for total chromium only, they shall be compared to the cleanup criteria for Cr VI. Cr III soil cleanup criterion for protection of drinking water can only be used at sites where groundwater is prevented from being used as a public water supply, currently and in the future, through an approved land or resource use restriction.

(J) = Hazardous substance may be present in several isomer forms. Isomer-specific concentrations shall be added together for comparison to criteria.

(L) = Criteria for lead are derived using a biologically based model, as allowed for under Section 20120a(9) of the NREPA, and are not calculated using the algorithms and assumptions specified in pathway-specific rules. The generic residential drinking water criterion of 4 ug/L is linked to the generic residential soil direct contact criterion of 400 mg/kg. A higher concentration in the drinking water, up to the state action level of 15 ug/L, may be allowed as a site-specific remedy and still allow for drinking water use, under Section 20120a(2) and 20120b of the NREPA if soil concentrations are appropriately lower than 400 mg/kg. If a site-specific criterion is approved based on this subdivision, a notice shall be filed on the deed for all property where the groundwater concentrations will exceed 4 ug/L to provide notice of the potential for unacceptable risk if soil or groundwater concentrations increase. Acceptable combinations of site-specific soil and drinking water concentrations are presented in a table available on the EGLE internet web site (See R 299.49 Footnotes for generic cleanup criteria tables for additional information).

(M) = Calculated criterion is below the analytical target detection limit, therefore, the criterion defaults to the target detection limit.

(S) = Criterion defaults to the hazardous substance-specific water solubility limit.

(T) = Refer to the federal Toxic Substances Control Act (TSCA), 40 C.F.R. §761, Subpart D and 40 C.F.R. §761, Subpart G, to determine the applicability of TSCA cleanup standards. Subpart D and Subpart G of 40 C.F.R. §761 (July 1, 2001) are adopted by reference in these rules and are available for inspection at the EGLE, 525 West Allegan Street, Lansing, Michigan. Copies of the regulations may be purchased, at a cost as of the time of adoption of these rules of \$55, from the Superintendent of Documents, Government Printing Office, Washington, DC 20401, or from the EGLE, RRD, 525 West Allegan Street, Lansing, Michigan 48933, at cost. Alternatives to compliance with the TSCA standards listed below are possible under 40 C.F.R. §761 Subpart D. New releases may be subject to the standards identified in 40 C.F.R. §761, Subpart G. Use Part 201 soil direct contact cleanup criteria in the published table if TSCA standards are not applicable.

(X) = The GSI criterion shown in the generic cleanup criteria tables is not protective for surface water that is used as a drinking water source. (See R 299.49 Footnotes for generic cleanup criteria tables for additional information.)

**Rule 57 Footnotes:** ID = insufficient data to derive value; NLS = no literature search has been conducted; @ = Bioaccumulative Chemical of Concern; \* = the lowest Human Noncancer Value (HNV), Wildlife Value (WV), Human Cancer Value (HCV), or Final Chronic Value (FCV) given for this chemical will adequately protect the uses identified with an ID\* or \*  
**EPA Region IV ESV Footnote:** **Red font** indicates a bioaccumulative chemical; ^ - Screening value is for filtered (dissolved) metals. A conversion factor (CF) was used to convert the screening value for total metals in surface water to a screening value for dissolved metals in surface water. CMC (dissolved) = CMC (total) × CF. See Table 1c for screening values for total (unfiltered) metals; \* - The freshwater screening value is hardness dependent. The screening value shown in Table 1a is for dissolved metals assuming a hardness of 50 mg/L as CaCO<sub>3</sub>. A correction for site-specific hardness was based on equations listed in Tables 1b and 1c. If hardness data are unavailable hardness may be estimated as: H = 2.497 × Ca (mg/L) + 4.118 × Mg (mg/L). A site-specific hardness value of 47.5 mg/kg CaCO<sub>3</sub> was used to determine values based on equations is Table 1b and 1c for total (unfiltered) metals.

**Laboratory Footnotes:**

J = The result is an estimated quantity.

U = Analyte analyzed for but not detected above the reported sample reporting limit.



**TABLE 15-1**  
**Sediment, Pore Water, and Submerged Drum Contents Analytical Results**  
**Quincy Mining Company Portage Operations Area**  
**Abandoned Mining Wastes - Torch Lake Non-Superfund Site**

|                                                                             | Applicable Criteria Evaluated                                   | Exceedance |
|-----------------------------------------------------------------------------|-----------------------------------------------------------------|------------|
| <b>EPA Region IV Sediment Ecological Screening Values (March 2018)</b>      | [1] Region IV Ecological Screening Value - Freshwater Sediment  | YES        |
| <b>Sediment Quality Guidelines (August 2006)</b>                            | [2] Threshold Effect Concentration                              | YES        |
|                                                                             | [3] Probable Effect Concentration                               | YES        |
| <b>EGLE Part 201 Generic Cleanup Criteria (December 2020)</b>               | [GW1] Residential Drinking Water Criteria                       | YES        |
|                                                                             | [GW2] Nonresidential Drinking Water Criteria                    | YES        |
|                                                                             | [GW3] Groundwater Surface Water Interface Criteria              | YES        |
| <b>EPA Region IV Surface Water Ecological Screening Values (March 2018)</b> | [SW1] Region IV Freshwater Ecological Screening Value - Chronic | YES        |
|                                                                             | [SW2] Region IV Freshwater Ecological Screening Value - Acute   | YES        |
| <b>EGLE Rule 57 Water Quality Values (August 2019)</b>                      | [SW3] Human Non-Cancer Value - Drinking Water Source            | YES        |
|                                                                             | [SW4] Human Cancer Value - Drinking Water Source                | NO         |
|                                                                             | [SW5] Wildlife Value                                            | NO         |

## 16. CONCLUSIONS AND RECOMMENDATIONS

The analytical results and interpretation summarized in the detailed findings presented in **Section 5** through **Section 15** document potential human health and ecological risks that are present in the QMCP. The following subsections provide a synopsis of these findings and a recommended path forward for mitigating the identified risks.

### 16.1 CONCLUSIONS

Environmental impacts in the QMCP are generally characterized by detections of organic and inorganic contaminants in soil, sediment, groundwater, and pore water; repercussions of mining era operations in the region. Although specific sources of these contaminants may not be fully understood, historical research related to the operations, closing, and eventual abandonment/scrapping of mining company operations provided substantive evidence for assessing specific operational areas and selecting target analytes anticipated to be present in environmental media throughout the area.

The findings of these investigative activities are summarized as follows with respect to the goals and objectives for the Project relative to the EGLE criteria at the time of Project completion:

- ACM was not identified in the study area.
- PCBs were only detected at one location (in Area J) and no soil, sediment, groundwater, or pore water samples analyzed for PCBs exceeded criteria or screening values in the study area.
- The shallow and subsurface soil and groundwater analytical results for the QMCP SI contained a number of COCs at concentrations at or above applicable regulatory criteria. Results by subarea include:
  - Area A
    - Soil – Exceeded GSIPC
    - Groundwater – Exceeded Residential and Nonresidential DWC, GSIC, Residential and Nonresidential VIAC, and water solubility
    - Predominant COCs – VOCs, SVOCs, cyanide, and chloride
  - Area B
    - Soil – Exceeded Residential and Nonresidential DWPC, GSIPC, Residential VIAC, and Residential and Nonresidential DCC
    - Groundwater – Exceeded Residential and Nonresidential DWC, GSIC, Residential and Nonresidential VIAC, and water solubility
    - Predominant COCs – Inorganics, VOCs, SVOCs, cyanide, and chloride
  - Area E
    - Soil – Exceeded GSIPC
    - Groundwater – No exceedances
    - Predominant COCs – Inorganics, SVOCs
  - Area F
    - Soil – Exceeded Residential and Nonresidential DWPC, GSIPC, and Residential and Nonresidential DCC
    - Groundwater – No exceedances
    - Predominant COCs – Inorganics, VOCs, SVOCs, cyanide

- Area H
  - Soil – Exceeded GSIPC
  - Groundwater – No exceedances
  - Predominant COCs – Inorganics, VOCs,
- Area J
  - Soil – Exceeded GSIPC, Residential and Nonresidential PSIC, and Residential DCC
  - Groundwater – Not Sampled
  - Predominant COCs – Inorganics and VOCs
- Area K
  - Soil – Not Sampled
  - Groundwater – Not Sampled
- Area M
  - SACM – Asbestos not detected
  - Soil – Exceeded GSIPC and Residential and Nonresidential DCC
  - Groundwater – No Exceedances
  - Predominant COCs – Inorganics, VOCs, and SVOCs
- Area O
  - Soil – Not sampled
  - Groundwater – No exceedances
  - Predominant COCs – Pentachlorophenol
- Area P
  - Soil – Not sampled
  - Groundwater – Not sampled
- At Area B, reconnaissance activities identified one area of potentially oil stained soil that was observed originating from a hole to the north of the MDNR trail property, crossing the trail, and extending down to the edge of the Portage Canal. In addition, a suspect UST was observed along the shoreline. The source of the observed oil stained soil adjacent to the MDNR trail property has not been identified. At Area F, reconnaissance activities identified a pile of soil that had an oily odor along the MDNR trail property. Assessment activities detected soil impacts in certain areas of the MDNR trail property that exceeded Residential and Nonresidential DWPC, GSIPC, and Residential and Nonresidential DCC.
- Sediment analytical results exceeded ESVs, TECs, and PECs for inorganic contaminants and SVOCs, and exceeded an ESV for toluene.
- Pore water analytical results exceeded Residential and Nonresidential DWPC, GSIC, acute and chronic ESVs for inorganic compounds and SVOCs, and two samples exceeded the EGLE Rule 57 Human Drinking Water Non-Cancer Values for copper and/or lead.

The analytical results summarized above provide sufficient analytical data and lines of evidence to conclude that several subareas of QMCP are Facilities as defined in Section 20101(1)(s) of the NREPA. The following table provides a summary of the affected environmental media, applicable regulatory criteria, and potential receptors within the QMCP.

| QMCP – Media, Criteria, Potential Receptor Summary                  |                           |                                     |                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                     |                              |                |                        |            |            |              |                                         |                              |               |              |
|---------------------------------------------------------------------|---------------------------|-------------------------------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|------------------------------|----------------|------------------------|------------|------------|--------------|-----------------------------------------|------------------------------|---------------|--------------|
| Media                                                               | Soil                      |                                     |                | Groundwater                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                     |                              | Air            |                        | Sediment   | Pore Water |              | Asbestos, RPM, and Abandoned Containers |                              |               |              |
| Criteria                                                            | Drinking Water Protection | Groundwater Surface Water Interface | Direct Contact | Drinking Water Protection                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Groundwater Surface Water Interface | Flammability and Explosivity | Volatilization | Particulate Inhalation | Ecological | Ecological | Human Health | Particulate Inhalation                  | Flammability and Explosivity | Environmental | Human Health |
| Potential Receptor                                                  |                           |                                     |                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                     |                              |                |                        |            |            |              |                                         |                              |               |              |
| Residential Human                                                   | ✓                         | ✓                                   | ✓              | ✓                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ✓                                   |                              | ✓              | ✓                      |            |            | ✓            |                                         |                              |               |              |
| Nonresidential Human                                                | ✓                         | ✓                                   | ✓              | ✓                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ✓                                   |                              | ✓              | ✓                      |            |            | ✓            |                                         |                              |               |              |
| Water Column Organism                                               |                           |                                     |                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                     |                              |                |                        |            | ✓          |              |                                         |                              |               |              |
| Benthic Organism                                                    |                           |                                     |                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                     |                              |                |                        | ✓          |            |              |                                         |                              | ✓             |              |
| COCs exceeding applicable regulatory criteria in one or more sample |                           |                                     |                | ARSENIC, CHROMIUM, COPPER, LEAD, MANGANESE, MERCURY, SILVER, ZINC, BENZENE, ETHYLBENZENE, 2-METHYLNAPHTHALENE, NAPHTHALENE (VOC), TETRACHLOROETHYLENE, TOLUENE, 1,2,4-TRIMETHYLBENZENE, XYLENE - TOTAL, ACENAPHTHENE, ACENAPHTHYLENE, ANTHRACENE, BENZO(A)ANTHRACENE, BENZO(A)PYRENE, BENZO(B)FLUORANTHENE, BENZO(G,H,I)PERYLENE, BENZO(K)FLUORANTHENE, CHRYSENE, DIBENZOFURAN, DIBENZO(A,H)ANTHRACENE, FLUORANTHENE, FLUORENE, INDENO(1,2,3-CD)PYRENE, NAPHTHALENE (SVOC), PHENANTHRENE, PYRENE, CYANIDE, CHLORIDE |                                     |                              |                |                        |            |            |              |                                         |                              |               |              |

Although relevant, EGLE drinking water and groundwater/surface water interface pathway criteria exceedances for metals are excluded from the soil and groundwater evaluation in the detailed findings. The rationale for this exclusion is twofold:

- The Project investigation and anticipated response actions are being undertaken pursuant to Part 201 of Michigan's NREPA, being PA 451 of 1994, as amended. The concentrations of metals in excess of EGLE drinking water and surface water pathway criteria are ubiquitous in the study area and are predominantly the result of the presence of stamp sands. Stamp sands are not defined as a hazardous substance nor are they subject to regulation under Part 201 unless the property otherwise contains hazardous substances in excess of concentrations that satisfy the cleanup criteria for unrestricted residential use; and,
- The study area is part of OU 2 for which the EPA ROD remedy called for No Action. The EPA's ROD for OU 2 includes groundwater, surface water, submerged tailings and sediments in Torch Lake, Portage Lake, the Portage Canal, and other area water bodies. Note that EPA's No Action determination relies on the following to mitigate the effects of stamp sand to the extent practicable:
  - The reduction of stamp sand loading to surface water bodies expected as a result of the remedial action taken at OU 1 and OU 3.
  - Ongoing natural sedimentation and detoxification.
  - Institutional programs and practices controlling potential future exposure to site-affected drinking water that were intended to be administered at the county and state level.
  - The long-term monitoring and the five-year review process monitoring requirements of the remedy selected for OU 1 and OU 3 under the 1992 ROD.

Note that metals criteria for other relevant pathways, and organic and cyanide contaminants for all pathways were included in the evaluation.

In addition to the evaluation of analytical results collected from the study area, the following provides a summary of findings derived from the assessment of the QMCP with respect to the goals and objectives for the Project:

- Terrestrial sources of contamination are present in the form of inorganic COCs, SVOCs, VOCs, and cyanide in the study area;
- In-lake sources of contamination are present in the form of inorganic COCs and SVOCs in the study area sediments and some areas of pore water. The detection of SVOCs in at least certain locations may be indicative of terrestrial source areas;
- No in-lake or terrestrial uncharacterized waste deposits were identified in the study area;
- PCBs were only detected at one location (in Area J) and no samples analyzed for PCBs exceeded EGLE criteria in the study area;
- ACM was not identified in the study area; and,
- Industrial ruins, including foundations and building floors associated with mill ruins are present. Uneven terrain, structure remnants, and metal debris pose a potential physical hazard due to slip, trip, and fall concerns.

## 16.2 RECOMMENDATIONS

The conclusions outlined in the preceding subsection establish that certain parcels within QMCP are Facilities. The following is an outline of options for managing potential exposure risks in the QMCP and Portage Canal.

Section 20107a of Part 201 of NREPA describes the duties of owners or operators of a Facility, regardless of their liability, including: prevent unacceptable exposures, prevent exacerbation, and take reasonable precautions against the foreseeable actions of third parties. Some exceptions may apply; in any case, owners and operators of contaminated properties should become familiar with Section 20107a and the associated Rules.

Actions have been taken through the implementation of remedial measures, such as the placement of a soil and vegetative cap on bulk waste deposits in Area M and Area O in Dollar Bay, to address certain environmental issues.

Future property users could conduct a risk assessment based on current and anticipated future land-use to help identify remedial goals for properties where potential risks may be present. Assessment based on current and future land-use contributes to the beneficial and safe re-use and potential redevelopment of any given property by clarifying applicability of regulatory statutes, as traditional property zoning (residential versus nonresidential) is generally undefined in the study area.

Once property-specific exposure risks have been evaluated, remedial objectives can be established with appropriate land use restrictions that minimize or eliminate potential exposure risks. These land-use restrictions, or administrative controls, could be employed to ensure that exposures are reliably restricted by a restrictive covenant, institutional control, or other mechanism allowed for under Part 201.

By copy of this SI Report, the Project findings were provided to RRD SFS which is responsible for monitoring EPA's remedy for the Torch Lake Superfund Site. RRD SFS should evaluate whether any remedy modifications are necessary

in the Portage Canal or terrestrial areas previously addressed by EPA in light of the additional information provided by the Project.

EGLE should continue to provide new study data to governmental stakeholders responsible for implementation and monitoring EPA's remedy for the terrestrial and in-lake portion of the Torch Lake Superfund Site so they can determine if any remedy modifications are necessary in light of the additional information provided by the Project. Responsible stakeholders should verify that administrative controls for areas that have been previously remediated by the EPA have been employed to ensure that EPA's selected remedy is performing as designed and those institutional controls, where required, have been recorded and are being enforced.

Additionally, EGLE should continue to provide new study data to property owners and governmental stakeholders responsible for assessing potential public health impacts and making recommendations to the public, property owners, and other state agencies.



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## FIGURES





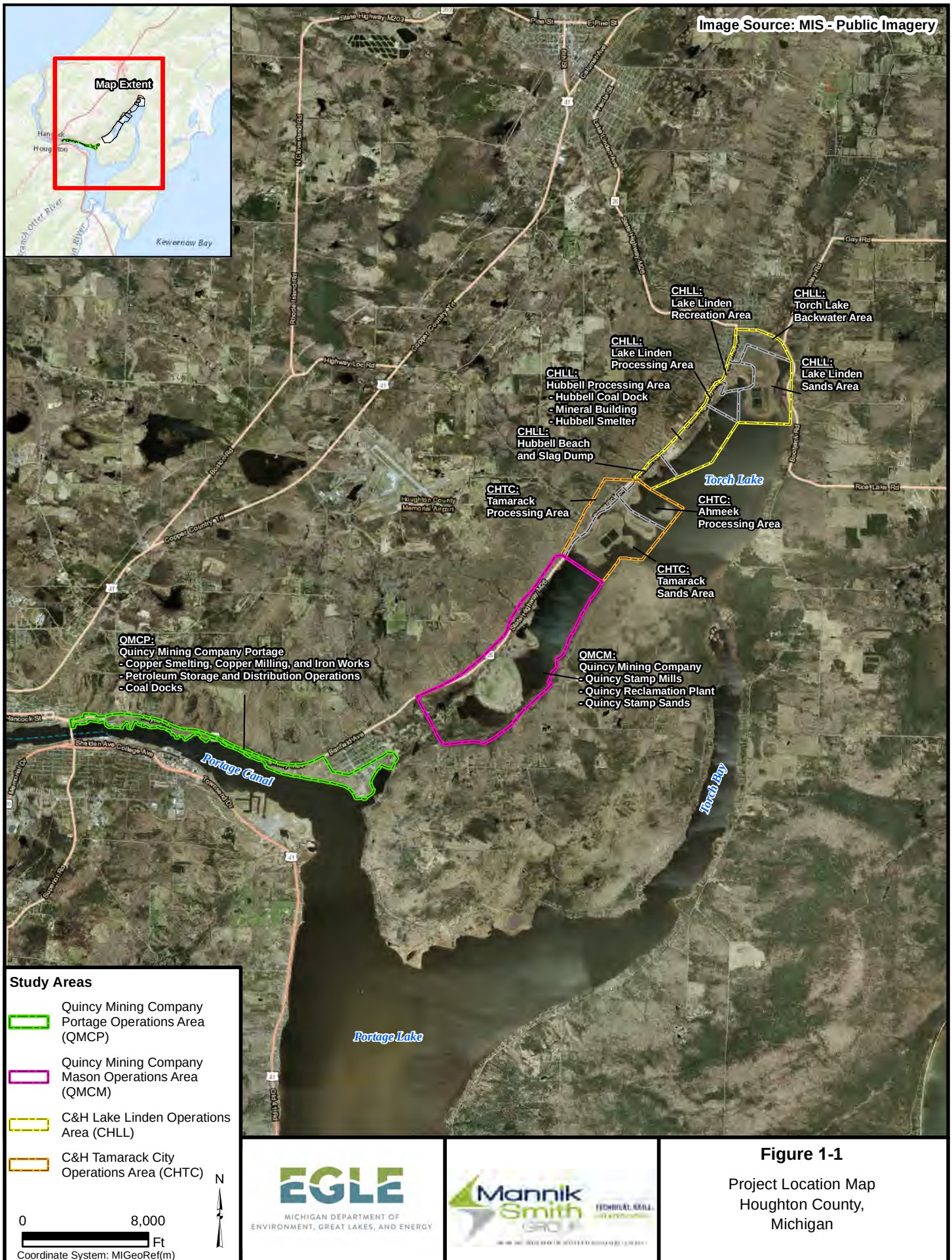
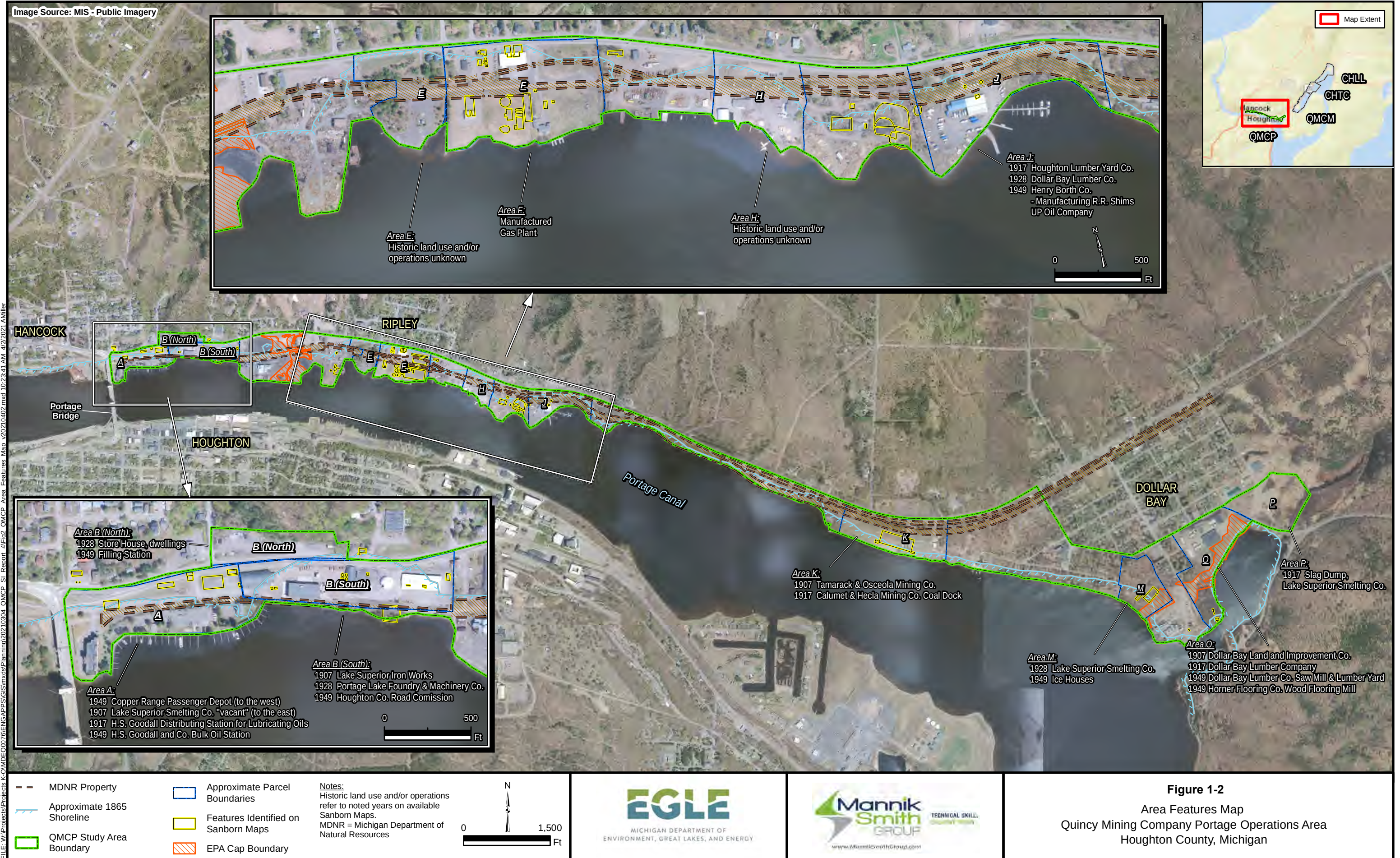


**Figure 1-1**

Project Location Map  
Houghton County,  
Michigan





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## TABLES





Table 2-1  
Summary of Historical Operations  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Area      | Year                   | Historical Operations                                    | Potential Contaminant Sources                                                                                                                           |
|-----------|------------------------|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| A         | 1907, 1917, 1928, 1949 | Copper Range Passenger Depot (to the west)               | -Petroleum contamination from valve pit. Valve pit emptied and removed and the surrounding area excavated in 1989.                                      |
|           | 1907                   | Lake Superior Smelting Co. "vacant" (to the east)        | -Potential storage and handling of other oils and lubricants.                                                                                           |
|           | 1917                   | H.S. Goodell Distributing Station for Lubricating Oils   | -Potential ACM used for insulation of equipment and fire retardant, along with uses in roofing material.                                                |
|           | 1928, 1949             | H.S. Goodell & Co. Bulk Oil Station                      |                                                                                                                                                         |
| B (South) | 1907                   | Lake Superior Iron Works                                 | -Historic AST/UST systems removed during the 1960's and 1970's.                                                                                         |
|           | 1917, 1928             | Portage Lake Foundry & Machinery Co.                     | -Gasoline spill excavated in late 1970's.                                                                                                               |
|           | 1949                   | Houghton Co. Road Commission                             | -500 gallon UST removed in 1996.                                                                                                                        |
|           |                        |                                                          | -Potential for the use of oils and lubricants for maintenance of equipment.                                                                             |
| B (North) | 1907, 1917, 1928       | Store House, dwellings                                   | -Potential chloride contamination from road salt storage.                                                                                               |
|           | 1949                   | Filling Station                                          | -Potential ACM used for insulation of equipment and fire retardant, along with uses in roofing material.                                                |
| E         |                        | Historic land use and/or operations unknown.             | -Petroleum contamination from former AST/UST systems on site.                                                                                           |
|           |                        |                                                          | -UST System decommissioned in 1998.                                                                                                                     |
| F         | 1907, 1917             | Houghton Co. Gas & Coke Co. (to the west)                | -Environmental concerns previously addressed.                                                                                                           |
|           |                        | Portage Coal & Dock Co. (to the east)                    |                                                                                                                                                         |
|           |                        | Ward & Williams Brass Furnace (to the north)             |                                                                                                                                                         |
|           | 1928                   | Michigan Gas & Electric Co. Gas Plant (to the west)      |                                                                                                                                                         |
|           |                        | Portage Coal & Dock Co. (to the east)                    |                                                                                                                                                         |
|           |                        | Ward & Williams Brass Furnace (to the north)             |                                                                                                                                                         |
|           | 1949                   | Michigan Gas & Electric Co. Gas Plant (to the west)      |                                                                                                                                                         |
|           |                        | Superior Bottled Gas Co. (to the east)                   |                                                                                                                                                         |
|           |                        | Ward Brass Furnace (to the north)                        |                                                                                                                                                         |
|           |                        | Standard Oil Co. (to the northeast)                      |                                                                                                                                                         |
| H         |                        | Filling Station and Bulk Oil Station (to the northwest)  |                                                                                                                                                         |
|           |                        | Historic land use and/or operations unknown              | -Unknown.                                                                                                                                               |
| J         | 1907, 1917             | Houghton Lumber Yard Co.                                 | -Potential for the use of oils and lubricants for maintenance of equipment.                                                                             |
|           | 1928                   | Dollar Bay Lumber Co.                                    |                                                                                                                                                         |
|           | 1949                   | Henry Borth Co. Manufacturing R.R. Shims, UP Oil Company |                                                                                                                                                         |
| K         | 1907                   | Tamarack & Osceola Mining Co.                            | -Coal storage.                                                                                                                                          |
|           | 1917                   | Calumet & Hecla Mining Co. Coal Dock                     | -Potential for the use of oils and lubricants for maintenance of equipment.                                                                             |
|           | 1928, 1949             | not found                                                |                                                                                                                                                         |
| M         | 1907, 1917, 1928       | Lake Superior Smelting Co.                               | -PCP detections in prior investigations.                                                                                                                |
|           | 1949                   | Ice Houses                                               | -Observations of industrial ruins, debris, suspected ACM, stamp sand and slag piles.                                                                    |
| O         | 1907                   | Dollar Bay Land and Improvement Co.                      | -One parcel was capped as part of the Torch Lake Superfund Site Dollar Bay remedial action.                                                             |
|           | 1917                   | Dollar Bay Lumber Company                                | -PCP detections during prior investigations. The use of PCP was reportedly discontinued in mid-1980's. A contaminated utility pole was removed in 1995. |
|           | 1928, 1949             | Dollar Bay Lumber Co. Saw Mill & Lumber Yard             | -Potential for the use of oils and lubricants for maintenance of equipment.                                                                             |
|           | 1949                   | Horner Flooring Co. Wood Flooring Mill                   | -A portion of the property was capped as part of the Torch Lake Superfund Site Dollar Bay remedial action.                                              |
| P         | 1917                   | Slag Dump, Lake Superior Smelting Co.                    | -Slag storage.                                                                                                                                          |

Notes:

AST = Above ground storage tank

MDNR = Michigan Department of Natural Resources

UST = Underground storage tank

ROW = Right of way

EPA = United States Environmental Protection Agency

PCP = Pentachlorophenol

ACM = Asbestos containing material

Table 3-1  
Sampling and Analysis Summary  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Proposed Sampling Location | Sample Date | Field Sample Identification                | Laboratory Work Order Number | Longitude    | Latitude    | Sampling Rationale                                                          | Sample Description                               | Friable/ Non-Friable | Sample Notes                                                    | Sampling Method   | Sample Type/Matrix |                 |             |               |          | Sample Analyses             |      |       |      |        | Water Quality Parameters |          |                  |                      |                      | Duplicate Analyses |                 |      |       |      | Property Ownership |                   |         |
|----------------------------|-------------|--------------------------------------------|------------------------------|--------------|-------------|-----------------------------------------------------------------------------|--------------------------------------------------|----------------------|-----------------------------------------------------------------|-------------------|--------------------|-----------------|-------------|---------------|----------|-----------------------------|------|-------|------|--------|--------------------------|----------|------------------|----------------------|----------------------|--------------------|-----------------|------|-------|------|--------------------|-------------------|---------|
|                            |             |                                            |                              |              |             |                                                                             |                                                  |                      |                                                                 |                   | Surface Soil       | Subsurface Soil | Groundwater | Surface Water | Sediment | Drums, Containers, and SACM | VOCs | SVOCs | PCBs | Metals | Cyanide                  | Asbestos | Temperature (C°) | Conductivity (mS/cm) | Dissolved Oxygen (%) | pH                 | Turbidity (nTu) | VOCs | SVOCs | PCBs |                    | Metals            | Cyanide |
| Area A                     |             |                                            |                              |              |             |                                                                             |                                                  |                      |                                                                 |                   |                    |                 |             |               |          |                             |      |       |      |        |                          |          |                  |                      |                      |                    |                 |      |       |      |                    |                   |         |
| QMCP-SB01                  |             | QMCP-SB01 a <sub>1</sub> -b <sub>1</sub> " |                              | -88.5732228  | 47.1254654  | Data Gap - Area A, proximal to historic oil house                           |                                                  | --                   | Location not sampled.                                           | Soil Core         | X                  |                 |             |               |          |                             |      |       |      |        |                          |          |                  |                      |                      |                    |                 |      |       |      | Y                  | State of Michigan |         |
|                            |             | QMCP-SB01 a <sub>2</sub> -b <sub>2</sub> " |                              |              |             | Data Gap - Area A, proximal to historic oil house                           |                                                  | --                   | Location not sampled.                                           | Soil Core         | X                  |                 |             |               |          |                             |      |       |      |        |                          |          |                  |                      |                      |                    |                 |      |       |      | Y                  | State of Michigan |         |
| QMCP-SB02                  |             | QMCP-SB02 a <sub>1</sub> -b <sub>1</sub> " |                              | -88.5719018  | 47.1256306  | Data Gap - Area A, proximal to historic bulk oil station, MW #9 (10/3/1990) |                                                  | --                   | Location not sampled.                                           | Soil Core         | X                  |                 |             |               |          |                             |      |       |      |        |                          |          |                  |                      |                      |                    |                 |      |       |      | Y                  | State of Michigan |         |
|                            |             | QMCP-SB02 a <sub>2</sub> -b <sub>2</sub> " |                              |              |             | Data Gap - Area A, proximal to historic bulk oil station, MW #9 (10/3/1990) |                                                  | --                   | Location not sampled.                                           | Soil Core         | X                  |                 |             |               |          |                             |      |       |      |        |                          |          |                  |                      |                      |                    |                 |      |       |      | Y                  | State of Michigan |         |
| QMCP-SB03                  |             | QMCP-SB03 a <sub>1</sub> -b <sub>1</sub> " |                              | -88.5716499  | 47.1256591  | Area A, proximal to historic bulk oil station, TH#5 (4/17/1990)             |                                                  | --                   | Location not sampled.                                           | Soil Core         | X                  |                 |             |               |          |                             |      |       |      |        |                          |          |                  |                      |                      |                    |                 |      |       |      | Y                  | State of Michigan |         |
|                            |             | QMCP-SB03 a <sub>2</sub> -b <sub>2</sub> " |                              |              |             | Area A, proximal to historic bulk oil station, TH#5 (4/17/1990)             |                                                  | --                   | Location not sampled.                                           | Soil Core         | X                  |                 |             |               |          |                             |      |       |      |        |                          |          |                  |                      |                      |                    |                 |      |       |      | Y                  | State of Michigan |         |
| QMCP-SB04                  |             | QMCP-SB04 a <sub>1</sub> -b <sub>1</sub> " |                              | -88.5704147  | 47.1257691  | Data Gap - Area A, proximal to historic bulk oil station, MW-113 (3/6/1997) |                                                  | --                   | Location not sampled.                                           | Soil Core         | X                  |                 |             |               |          |                             |      |       |      |        |                          |          |                  |                      |                      |                    |                 |      |       |      | Y                  | State of Michigan |         |
|                            |             | QMCP-SB04 a <sub>2</sub> -b <sub>2</sub> " |                              |              |             | Data Gap - Area A, proximal to historic bulk oil station, MW-113 (3/6/1997) |                                                  | --                   | Location not sampled.                                           | Soil Core         | X                  |                 |             |               |          |                             |      |       |      |        |                          |          |                  |                      |                      |                    |                 |      |       |      | Y                  | State of Michigan |         |
| QMCP-GW01                  |             | QMCP-GW01 a <sub>1</sub> -b <sub>1</sub> " |                              | -88.5732228  | 47.1254654  | Data Gap - Area A, proximal to historic oil house                           |                                                  | --                   | Location not sampled.                                           | Low-Flow Sampling |                    | X               |             |               |          |                             |      |       |      |        |                          |          |                  |                      |                      |                    |                 |      |       |      | Y                  | State of Michigan |         |
| QMCP-GW02                  |             | QMCP-GW02 a <sub>1</sub> -b <sub>1</sub> " |                              | -88.5719018  | 47.1256306  | Data Gap - Area A, proximal to historic bulk oil station, MW #9 (10/3/1990) |                                                  | --                   | Location not sampled.                                           | Low-Flow Sampling |                    | X               |             |               |          |                             |      |       |      |        |                          |          |                  |                      |                      |                    |                 |      |       |      | Y                  | State of Michigan |         |
| QMCP-GW03                  |             | QMCP-GW03 a <sub>1</sub> -b <sub>1</sub> " |                              | -88.5716499  | 47.1256591  | Area A, proximal to historic bulk oil station, TH#5 (4/17/1990)             |                                                  | --                   | Location not sampled.                                           | Low-Flow Sampling |                    | X               |             |               |          |                             |      |       |      |        |                          |          |                  |                      |                      |                    |                 |      |       |      | Y                  | State of Michigan |         |
| QMCP-GW04                  |             | QMCP-GW04 a <sub>1</sub> -b <sub>1</sub> " |                              | -88.5704147  | 47.1257691  | Data Gap - Area A, proximal to historic bulk oil station, MW-113 (3/6/1997) |                                                  | --                   | Location not sampled.                                           | Low-Flow Sampling |                    | X               |             |               |          |                             |      |       |      |        |                          |          |                  |                      |                      |                    |                 |      |       |      | Y                  | State of Michigan |         |
| Area B                     |             |                                            |                              |              |             |                                                                             |                                                  |                      |                                                                 |                   |                    |                 |             |               |          |                             |      |       |      |        |                          |          |                  |                      |                      |                    |                 |      |       |      |                    |                   |         |
| QMCP-SB05                  |             | QMCP-SB05 a <sub>2</sub> -b <sub>2</sub> " |                              | -88.56933348 | 47.12578863 | Area B (South), proximal to historic oil pump house and oil tank            |                                                  | --                   | Location not sampled.                                           | Soil Core         | X                  |                 |             |               |          |                             |      |       |      |        |                          |          |                  |                      |                      |                    |                 |      |       |      | Y                  | State of Michigan |         |
|                            |             | QMCP-SB05 a <sub>2</sub> -b <sub>2</sub> " |                              |              |             | Area B (South), proximal to historic oil pump house and oil tank            |                                                  | --                   | Location not sampled.                                           | Soil Core         | X                  |                 |             |               |          |                             |      |       |      |        |                          |          |                  |                      |                      |                    |                 |      |       |      | Y                  | State of Michigan |         |
| QMCP-SB06                  |             | QMCP-SB06 a <sub>1</sub> -b <sub>1</sub> " |                              | -88.56832514 | 47.12576694 | Area B (South), proximal to SS-7 (6/5/2002) and SB-113 (7/20/1995)          |                                                  | --                   | Location not sampled.                                           | Soil Core         | X                  |                 |             |               |          |                             |      |       |      |        |                          |          |                  |                      |                      |                    |                 |      |       |      | Y                  | State of Michigan |         |
|                            |             | QMCP-SB06 a <sub>2</sub> -b <sub>2</sub> " |                              |              |             | Area B (South), proximal to SS-7 (6/5/2002) and SB-113 (7/20/1995)          |                                                  | --                   | Location not sampled.                                           | Soil Core         | X                  |                 |             |               |          |                             |      |       |      |        |                          |          |                  |                      |                      |                    |                 |      |       |      | Y                  | State of Michigan |         |
| QMCP-SB07                  | 9/11/2018   | QMCP-SB7 0-3                               | 1809120                      | -88.5675852  | 47.12573925 | Data Gap -Area B (South), proximal to historic mining operation             | SAND, Fine to medium, brown, saturated at 3 feet | --                   | Listed as QMCP-SB7 0-3 on lab report. Cyanide analysis omitted. | Soil Core         | X                  |                 |             |               |          | X                           | X    | X     | X    |        |                          |          |                  |                      |                      |                    |                 |      |       |      | Y                  | State of Michigan |         |
|                            |             | QMCP-SB07 a <sub>2</sub> -b <sub>2</sub> " |                              |              |             | Data Gap -Area B (South), proximal to historic mining operation             |                                                  | --                   | Sample not collected.                                           | Soil Core         | X                  |                 |             |               |          |                             |      |       |      |        |                          |          |                  |                      |                      |                    |                 |      |       |      | Y                  | State of Michigan |         |
| QMCP-SB08                  |             | QMCP-SB08 a <sub>1</sub> -b <sub>1</sub> " |                              | -88.56559461 | 47.12570969 | Data Gap - Area B (South), proximal to historic mining operation            |                                                  | --                   | Location not sampled.                                           | Soil Core         | X                  |                 |             |               |          |                             |      |       |      |        |                          |          |                  |                      |                      |                    |                 |      |       |      | Y                  | State of Michigan |         |
|                            |             | QMCP-SB08 a2-b2"                           |                              |              |             | Data Gap - Area B (South), proximal to historic mining operation            |                                                  | --                   | Location not sampled.                                           | Soil Core         | X                  |                 |             |               |          |                             |      |       |      |        |                          |          |                  |                      |                      |                    |                 |      |       |      | Y                  | State of Michigan |         |
| QMCP-SB67                  | 9/11/2018   | QMCP-SB67 0-3                              | 1809120                      | -88.5687629  | 47.12576855 | Data Gap - Area B (South), proximal to historic mining operation            | SAND, Fine to medium, brown, saturated at 3 feet | --                   | Limited metal analysis requested. PCB/Cyanide analysis omitted. | Soil Core         | X                  |                 |             |               |          | X                           | X    |       | X    |        |                          |          |                  |                      |                      |                    |                 |      |       |      | Y                  | State of Michigan |         |
|                            |             | QMCP-SB67 a <sub>2</sub> -b <sub>2</sub> ' |                              |              |             | Data Gap - Area B (South), proximal to historic mining operation            |                                                  | --                   | Sample not collected.                                           | Soil Core         | X                  |                 |             |               |          |                             |      |       |      |        |                          |          |                  |                      |                      |                    |                 |      |       |      | Y                  | State of Michigan |         |

Table 3-1  
Sampling and Analysis Summary  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Proposed Sampling Location | Sample Date | Field Sample Identification                | Laboratory Work Order Number | Longitude    | Latitude    | Sampling Rationale                                                 | Sample Description                               | Friable/ Non-Friable | Sample Notes                                                    | Sampling Method   | Sample Type/Matrix |                 |             |               |          |                             | Sample Analyses |       |      |        |         |          | Water Quality Parameters |                      |                      |      |                 | Duplicate Analyses |       |      |        |         | Trail ROW | Property Ownership |                   |
|----------------------------|-------------|--------------------------------------------|------------------------------|--------------|-------------|--------------------------------------------------------------------|--------------------------------------------------|----------------------|-----------------------------------------------------------------|-------------------|--------------------|-----------------|-------------|---------------|----------|-----------------------------|-----------------|-------|------|--------|---------|----------|--------------------------|----------------------|----------------------|------|-----------------|--------------------|-------|------|--------|---------|-----------|--------------------|-------------------|
|                            |             |                                            |                              |              |             |                                                                    |                                                  |                      |                                                                 |                   | Surface Soil       | Subsurface Soil | Groundwater | Surface Water | Sediment | Drums, Containers, and SACM | VOCs            | SVOCs | PCBs | Metals | Cyanide | Asbestos | Temperature (C°)         | Conductivity (mS/cm) | Dissolved Oxygen (%) | pH   | Turbidity (nTu) | VOCs               | SVOCs | PCBs | Metals | Cyanide |           |                    |                   |
| Area B (Continued)         |             |                                            |                              |              |             |                                                                    |                                                  |                      |                                                                 |                   |                    |                 |             |               |          |                             |                 |       |      |        |         |          |                          |                      |                      |      |                 |                    |       |      |        |         |           |                    |                   |
| QMCP-SB68                  | 9/11/2018   | QMCP-SB68 0-3                              | 1809120                      | -88.56793407 | 47.12573848 | Data Gap - Area B (South), proximal to historic mining operation   | SAND, Fine to medium, brown, saturated at 3 feet | --                   | Limited metal analysis requested. PCB/Cyanide analysis omitted. | Soil Core         |                    | X               |             |               |          |                             |                 | X     | X    |        | X       |          |                          |                      |                      |      |                 |                    |       |      |        |         |           | Y                  | State of Michigan |
|                            |             | QMCP-SB68 a <sub>2</sub> -b <sub>2</sub> ' |                              |              |             | Data Gap - Area B (South), proximal to historic mining operation   |                                                  | --                   | Sample not collected.                                           | Soil Core         |                    | X               |             |               |          |                             |                 |       |      |        |         |          |                          |                      |                      |      |                 |                    |       |      |        |         |           | Y                  | State of Michigan |
| QMCP-SB69                  |             | QMCP-SB69 a <sub>1</sub> -b <sub>1</sub> " |                              | -88.56674588 | 47.12571488 | Data Gap - Area B (South), near historic coal dock                 |                                                  | --                   | Location not sampled.                                           | Soil Core         |                    | X               |             |               |          |                             |                 |       |      |        |         |          |                          |                      |                      |      |                 |                    |       |      |        |         |           | Y                  | State of Michigan |
|                            |             | QMCP-SB69 a <sub>2</sub> -b <sub>2</sub> ' |                              |              |             | Data Gap - Area B (South), near historic coal dock                 |                                                  | --                   | Location not sampled.                                           | Soil Core         |                    | X               |             |               |          |                             |                 |       |      |        |         |          |                          |                      |                      |      |                 |                    |       |      |        |         |           | Y                  | State of Michigan |
| QMCP-GW05                  |             | QMCP-GW05 a <sub>1</sub> -b <sub>1</sub> " |                              | -88.56933348 | 47.12578863 | Area B (South), proximal to historic oil pump house and oil tank   |                                                  | --                   | Location not sampled.                                           | Low-Flow Sampling |                    |                 | X           |               |          |                             |                 |       |      |        |         |          |                          |                      |                      |      |                 |                    |       |      |        |         |           | Y                  | State of Michigan |
| QMCP-GW06                  |             | QMCP-GW06 a <sub>1</sub> -b <sub>1</sub> " |                              | -88.56832514 | 47.12576694 | Area B (South), proximal to SS-7 (6/5/2002) and SB-113 (7/20/1995) |                                                  | --                   | Location not sampled.                                           | Low-Flow Sampling |                    |                 | X           |               |          |                             |                 |       |      |        |         |          |                          |                      |                      |      |                 |                    |       |      |        |         |           | Y                  | State of Michigan |
| QMCP-GW07                  | 9/11/2018   | QMCP-GW7 3-7                               | 1809119                      | -88.5675852  | 47.12573925 | Data Gap -Area B (South), proximal to historic mining operation    |                                                  | --                   |                                                                 | Low-Flow Sampling |                    |                 | X           |               |          |                             | X               | X     | X    | X      |         |          | 17.8                     | 0.880                | 2.4                  | 6.48 | NM              |                    |       |      |        |         |           | Y                  | State of Michigan |
| QMCP-GW08                  |             | QMCP-GW08 a <sub>1</sub> -b <sub>1</sub> " |                              | -88.56559461 | 47.12570969 | Data Gap - Area B (South), proximal to historic mining operation   |                                                  | --                   | Location not sampled.                                           | Low-Flow Sampling |                    |                 | X           |               |          |                             |                 |       |      |        |         |          |                          |                      |                      |      |                 |                    |       |      |        |         |           | Y                  | State of Michigan |
| QMCP-GW67                  | 9/11/2018   | QMCP-GW67 3-7'                             | 1809119                      | -88.5687629  | 47.12576855 | Data Gap - Area B (South), proximal to historic mining operation   |                                                  | --                   |                                                                 | Low-Flow Sampling |                    |                 | X           |               |          |                             | X               | X     | X    | X      |         |          | 18.7                     | 0.235                | 3.0                  | 6.75 | NM              |                    |       |      |        |         |           | Y                  | State of Michigan |
| QMCP-GW68                  | 9/11/2019   | QMCP-GW68 3-7                              | 1809119                      | -88.56793407 | 47.12573848 | Data Gap - Area B (South), proximal to historic mining operation   |                                                  | --                   |                                                                 | Low-Flow Sampling |                    |                 | X           |               |          |                             | X               | X     | X    | X      |         |          | 19.5                     | 0.660                | 1.4                  | 7.72 | NM              |                    |       |      |        |         |           | Y                  | State of Michigan |
| QMCP-GW69                  |             | QMCP-GW69 a <sub>1</sub> -b <sub>1</sub> " |                              | -88.56674588 | 47.12571488 | Data Gap - Area B (South), near historic coal dock                 |                                                  | --                   | Location not sampled.                                           | Low-Flow Sampling |                    |                 | X           |               |          |                             |                 |       |      |        |         |          |                          |                      |                      |      |                 |                    |       |      |        |         |           | Y                  | State of Michigan |
| QMCP-MW301                 | 9/6/2018    | QMCP-MW-301                                | 1809070                      | -88.56703238 | 47.12563383 | Sample collection from existing monitoring wells.                  |                                                  | --                   |                                                                 | Low-Flow Sampling |                    |                 | X           |               |          |                             | X               | X     |      | X      |         |          | 10.8                     | 0.394                | 64.6                 | 7.82 | 2.65            |                    |       |      |        |         |           | Y                  | State of Michigan |
|                            | 9/23/2020   | QMCP-MW-301                                | 2009215                      |              |             | Re-sample collection from existing monitoring wells.               |                                                  | --                   |                                                                 | Low-Flow Sampling |                    |                 | X           |               |          |                             | X               | X     |      |        |         |          | 11.7                     | 0.459                | 87.5                 | 7.81 | 4.38            |                    |       |      |        |         |           | Y                  | State of Michigan |
| QMCP-MW302                 | 9/6/2018    | QMCP-MW-302                                | 1809070                      | -88.56717724 | 47.12564987 | Sample collection from existing monitoring wells.                  |                                                  | --                   |                                                                 | Low-Flow Sampling |                    |                 | X           |               |          |                             | X               | X     |      | X      |         |          | 15.6                     | 1.38                 | 0.8                  | 7.64 | 7.6             |                    |       |      |        |         |           | Y                  | State of Michigan |
|                            | 9/23/2020   | QMCP-MW-302                                | 2009215                      |              |             | Re-sample collection from existing monitoring wells                |                                                  | --                   |                                                                 | Low-Flow Sampling |                    |                 | X           |               |          |                             | X               | X     |      |        |         |          | 14.0                     | 1.70                 | 6.6                  | 5.01 | 8.3             |                    |       |      |        |         |           | Y                  | State of Michigan |
| QMCP-MW501                 | 9/7/2018    | QMCP-MW-501                                | 1809070                      | -88.56967665 | 47.12576912 | Sample collection from existing monitoring wells.                  |                                                  | --                   | Duplicated added: QMCP-MW501-DUP1.                              | Low-Flow Sampling |                    |                 | X           |               |          |                             | X               | X     |      | X      |         |          | 18.5                     | 0.19                 | 0.8                  | 6.55 | 5.3             | X                  | X     |      |        |         |           | Y                  | State of Michigan |
|                            | 9/23/2020   | QMCP-MW-501                                | 2009215                      |              |             | Re-sample collection from existing monitoring wells.               |                                                  | --                   | Duplicated added: QMCP-MW501-DUP1.                              | Low-Flow Sampling |                    |                 | X           |               |          |                             | X               | X     |      |        |         |          | 15.8                     | 0.29                 | 2.7                  | 6.73 | 2.3             | X                  | X     |      |        |         |           | Y                  | State of Michigan |
| QCMP-MW502                 | 9/7/2018    | QMCP-MW502                                 |                              | -88.56940964 | 47.1257554  | Sample collection from existing monitoring wells.                  |                                                  | --                   | Location not sampled, filled with sediment.                     | Low-Flow Sampling |                    |                 | X           |               |          |                             |                 |       |      |        |         |          |                          |                      |                      |      |                 |                    |       |      |        |         |           | Y                  | State of Michigan |
|                            |             | QMCP-MW502                                 |                              |              |             | Re-sample collection from existing monitoring wells.               |                                                  | --                   | Location not sampled, filled with sediment.                     | Low-Flow Sampling |                    |                 | X           |               |          |                             |                 |       |      |        |         |          |                          |                      |                      |      |                 |                    |       |      |        |         |           | Y                  | State of Michigan |
| QMCP-MW503                 | 9/7/2018    | QMCP-MW-503                                | 1809070                      | -88.56901491 | 47.12574808 | Sample collection from existing monitoring wells.                  |                                                  | --                   |                                                                 | Low-Flow Sampling |                    |                 | X           |               |          |                             | X               | X     |      | X      |         |          | 18.3                     | 0.256                | 8.4                  | 6.56 | 160             |                    |       |      |        |         |           | Y                  | State of Michigan |
|                            | 9/23/2020   | QMCP-MW-503                                | 2009215                      |              |             | Re-sample collection from existing monitoring wells.               |                                                  | --                   |                                                                 | Low-Flow Sampling |                    |                 | X           |               |          |                             | X               | X     |      |        |         |          | 16.0                     | 0.334                | 17.9                 | 4.38 | 14.8            |                    |       |      |        |         |           | Y                  | State of Michigan |
| QMCP-MW505                 | 9/6/2018    | QMCP-MW-505                                | 1809070                      | -88.56833961 | 47.12572934 | Sample collection from existing monitoring wells.                  |                                                  | --                   |                                                                 | Low-Flow Sampling |                    |                 | X           |               |          |                             | X               | X     |      | X      |         |          | 17.5                     | 0.32                 | 1.0                  | 7.24 | 1.5             |                    |       |      |        |         |           | Y                  | State of Michigan |
|                            | 9/23/2020   | QMCP-MW-505                                | 2009215                      |              |             | Re-sample collection from existing monitoring wells.               |                                                  | --                   |                                                                 | Low-Flow Sampling |                    |                 | X           |               |          |                             | X               | X     |      | X      |         |          | 16.7                     | 0.29                 | 7.0                  | 7.37 | 2.74            |                    |       |      |        |         |           | Y                  | State of Michigan |

Table 3-1  
Sampling and Analysis Summary  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Proposed Sampling Location | Sample Date | Field Sample Identification                | Laboratory Work Order Number | Longitude   | Latitude   | Sampling Rationale                                                                   | Sample Description                                   | Friable/ Non-Friable | Sample Notes                                                     | Sampling Method   | Sample Type/Matrix |                 |             |               |          |                             | Sample Analyses |       |      |        |         |          | Water Quality Parameters |                      |                      |      |                 | Duplicate Analyses |       |      |        |         | Trail ROW         | Property Ownership |
|----------------------------|-------------|--------------------------------------------|------------------------------|-------------|------------|--------------------------------------------------------------------------------------|------------------------------------------------------|----------------------|------------------------------------------------------------------|-------------------|--------------------|-----------------|-------------|---------------|----------|-----------------------------|-----------------|-------|------|--------|---------|----------|--------------------------|----------------------|----------------------|------|-----------------|--------------------|-------|------|--------|---------|-------------------|--------------------|
|                            |             |                                            |                              |             |            |                                                                                      |                                                      |                      |                                                                  |                   | Surface Soil       | Subsurface Soil | Groundwater | Surface Water | Sediment | Drums, Containers, and SACM | VOCs            | SVOCs | PCBs | Metals | Cyanide | Asbestos | Temperature (C°)         | Conductivity (mS/cm) | Dissolved Oxygen (%) | pH   | Turbidity (nTu) | VOCs               | SVOCs | PCBs | Metals | Cyanide |                   |                    |
| Area E                     |             |                                            |                              |             |            |                                                                                      |                                                      |                      |                                                                  |                   |                    |                 |             |               |          |                             |                 |       |      |        |         |          |                          |                      |                      |      |                 |                    |       |      |        |         |                   |                    |
| QMCP-SS06                  | 9/5/2018    | QMCP-SS-06-0-6"                            | 1809076                      | -88.5566732 | 47.1263296 | Data Gap - Area E                                                                    | Black stamp SAND, fine grained, darkened staining    | --                   |                                                                  | Hand Tools        | X                  |                 |             |               |          |                             |                 | X     |      | X      | X       |          |                          |                      |                      |      |                 |                    |       |      |        | Y       | State of Michigan |                    |
| QMCP-SS07                  |             | QMCP-SS07 a1-b1"                           |                              | -88.5570633 | 47.1258315 | Data Gap - Area E                                                                    |                                                      | --                   | Sample not collected.                                            | Hand Tools        | X                  |                 |             |               |          |                             |                 |       |      |        |         |          |                          |                      |                      |      |                 |                    |       |      |        | N       | Unknown           |                    |
| QMCP-SS08                  | 9/5/2018    | QMCP-SS-08-0-6"                            | 1809076                      | -88.5560079 | 47.1262809 | Data Gap - Area E, near MDNR observations of contaminated soil                       | Brown medium SAND, black darker staining             | --                   | Duplicate collected: QMCP-SS-08-0-6" DUP1                        | Hand Tools        | X                  |                 |             |               |          |                             |                 | X     |      | X      | X       |          |                          |                      |                      |      |                 |                    | X     |      | X      | X       | Y                 | State of Michigan  |
| QMCP-SS09                  | 9/5/2018    | QMCP-SS-09-0-6"                            | 1809076                      | -88.5561683 | 47.1255791 | Data Gap - Area E                                                                    | Red coarse stamp SAND with darkened finer stamp SAND | --                   | Near waste dump.                                                 | Hand Tools        | X                  |                 |             |               |          |                             |                 | X     | X    | X      | X       |          |                          |                      |                      |      |                 |                    |       |      |        | N       | Unknown           |                    |
| QMCP-SB19                  |             | QMCP-SB19 a <sub>1</sub> -b <sub>1</sub> " |                              | -88.5567006 | 47.1256310 | Data Gap - Area E, proximal to historic mining operation location                    |                                                      | --                   | Location not sampled.                                            | Soil Core         |                    | X               |             |               |          |                             |                 |       |      |        |         |          |                          |                      |                      |      |                 |                    |       |      |        | N       | Unknown           |                    |
|                            |             | QMCP-SB19 a <sub>2</sub> -b <sub>2</sub> " |                              |             |            | Data Gap - Area E, proximal to historic mining operation location                    |                                                      | --                   | Location not sampled.                                            | Soil Core         |                    | X               |             |               |          |                             |                 |       |      |        |         |          |                          |                      |                      |      |                 |                    |       |      |        | N       | Unknown           |                    |
| QMCP-SB20                  | 9/7/2018    | QMCP-SB 20-0-6"                            | 1809084                      | -88.5563715 | 47.1262121 | Data Gap - Area E, proximal to observations of soil contamination                    | SAND, Fine to medium, brown                          | --                   | Cyanide analysis omitted.                                        | Soil Core         |                    | X               |             |               |          |                             | X               | X     | X    | X      |         |          |                          |                      |                      |      |                 |                    |       |      |        | Y       | State of Michigan |                    |
|                            | 9/7/2018    | QMCP-SB 20-6"-4'                           | 1809084                      |             |            | Data Gap - Area E, proximal to observations of soil contamination                    | SAND, Medium to coarse, brown, saturated at 4 feet   | --                   | Cyanide analysis omitted. Duplicate sample omitted.              | Soil Core         |                    | X               |             |               |          |                             | X               | X     | X    | X      |         |          |                          |                      |                      |      |                 |                    |       |      |        | Y       | State of Michigan |                    |
| QMCP-SB21                  | 9/7/2018    | QMCP-SB 21-0-6"                            | 1809084                      | -88.5558833 | 47.1257233 | Data Gap - Area E, proximal to historic mining operation location                    | SAND, Medium to coarse, brown, saturated at 4 feet   | --                   | Cyanide analysis omitted.                                        | Soil Core         |                    | X               |             |               |          |                             | X               | X     | X    | X      |         |          |                          |                      |                      |      |                 |                    |       |      |        | N       | Unknown           |                    |
|                            | 9/7/2018    | QMCP-SB 21-6"-4'                           | 1809084                      |             |            | Data Gap - Area E, proximal to historic mining operation location                    | SAND, Medium to coarse, brown, saturated at 4 feet   | --                   | Cyanide analysis omitted.                                        | Soil Core         |                    | X               |             |               |          |                             | X               | X     | X    | X      |         |          |                          |                      |                      |      |                 |                    |       |      |        | N       | Unknown           |                    |
| QMCP-SB61                  | 9/7/2018    | QMCP-SB 61-0-6"                            | 1809084                      | -88.5560688 | 47.1262113 | Data Gap - Area E, proximal to observations of soil contamination                    | SAND, Fine to medium, brown                          | --                   | Cyanide analysis omitted.                                        | Soil Core         |                    | X               |             |               |          |                             | X               | X     | X    | X      |         |          |                          |                      |                      |      |                 |                    |       |      |        | Y       | State of Michigan |                    |
|                            | 9/7/2018    | QMCP-SB 61-6"-4'                           | 1809084                      |             |            | Data Gap - Area E, proximal to observations of soil contamination                    | SAND, Medium to coarse, brown, saturated at 4 feet   | --                   | Cyanide analysis omitted. Duplicated added: QMCP-SB 61 6"-4' DUP | Soil Core         |                    | X               |             |               |          |                             | X               | X     | X    | X      |         |          |                          |                      |                      |      |                 | X                  | X     | X    | X      | Y       | State of Michigan |                    |
| QMCP-GW19                  |             | QMCP-GW19 a <sub>1</sub> -b <sub>1</sub> " |                              | -88.5567006 | 47.1256310 | Data Gap - Area E, proximal to historic mining operation location                    |                                                      | --                   | Location not sampled.                                            | Low-Flow Sampling |                    |                 | X           |               |          |                             |                 |       |      |        |         |          |                          |                      |                      |      |                 |                    |       |      |        | N       | Dianne Sprague    |                    |
| QMCP-GW20                  | 9/7/2018    | QMCP-GW 20 5-9'                            | 1809086                      | -88.5563715 | 47.1262121 | Data Gap - Area E, proximal to observations of soil contamination                    |                                                      | --                   | PCB analysis omitted. Duplicate sample omitted.                  | Low-Flow Sampling |                    |                 | X           |               |          |                             | X               | X     |      | X      |         |          | 15.2                     | 0.280                | 2.90                 | 7.19 | NM              |                    |       |      |        | Y       | State of Michigan |                    |
| QMCP-GW21                  | 9/7/2018    | QMCP-GW 21 4-8'                            | 1809086                      | -88.5558833 | 47.1257233 | Data Gap - Area E, proximal to historic mining operation location                    |                                                      | --                   | PCB analysis omitted.                                            | Low-Flow Sampling |                    |                 | X           |               |          |                             | X               | X     |      | X      |         |          | 17.7                     | 0.700                | 2.30                 | 7.21 | NM              |                    |       |      |        | N       | Dianne Sprague    |                    |
| QMCP-GW61                  | 9/7/2018    | QMCP-GW 61 5-9'                            | 1809086                      | -88.5560688 | 47.1262113 | Data Gap - Area E, proximal to observations of soil contamination                    |                                                      | --                   | Duplicate collected: QMCP-GW61 5-9' DUP                          | Low-Flow Sampling |                    |                 | X           |               |          |                             | X               | X     | X    | X      |         |          | 14.6                     | 0.900                | 21.70                | 7.08 | NM              | X                  | X     | X    | X      | Y       | State of Michigan |                    |
| Area F                     |             |                                            |                              |             |            |                                                                                      |                                                      |                      |                                                                  |                   |                    |                 |             |               |          |                             |                 |       |      |        |         |          |                          |                      |                      |      |                 |                    |       |      |        |         |                   |                    |
| QMCP-SS51                  | 9/28/2018   | QMCP-SS51-0-3"                             | 1810006                      | -88.5544913 | 47.1259296 | Data Gap - Area F, proximal to historic filling station/tank farm                    | Soil in pile along trail                             | --                   | Slight petro-like odor.                                          | Hand Tools        | X                  |                 |             |               |          |                             |                 | X     | X    |        |         |          |                          |                      |                      |      |                 |                    |       |      |        | Y       | State of Michigan |                    |
| QMCP-SS310                 | 9/24/2020   | QMCP-SS310                                 | 2009271                      | -88.554443  | 47.1259100 | Hand auger to approximately 1-2' ft within pile sampled as QMCP-SS51, PCE exceedance |                                                      |                      |                                                                  |                   | X                  |                 |             |               |          |                             |                 |       |      |        |         |          |                          |                      |                      |      |                 |                    |       |      |        |         |                   |                    |
| QMCP-SS311                 | 9/24/2020   | QMCP-SS311                                 | 2009271                      | -88.554507  | 47.1259150 | Hand auger to approximately 1-2' ft within pile sampled as QMCP-SS51, PCE exceedance |                                                      |                      |                                                                  |                   | X                  |                 |             |               |          |                             |                 |       |      |        |         |          |                          |                      |                      |      |                 |                    |       |      |        |         |                   |                    |
| QMCP-SB64                  | 9/7/2018    | QMCP-SB 64-0-6"                            | 1809084                      | -88.5546749 | 47.1258830 | Data Gap - Area F, proximal to historic filling station/tank farm                    | SAND, Fine to medium, brown                          | --                   | Cyanide analysis omitted.                                        | Soil Core         |                    | X               |             |               |          |                             | X               | X     | X    | X      |         |          |                          |                      |                      |      |                 |                    |       |      |        | Y       | State of Michigan |                    |
|                            | 9/7/2018    | QMCP-SB 64-6"-5'                           | 1809084                      |             |            | Data Gap - Area F, proximal to historic filling station/tank farm                    | SAND, Medium to coarse, brown, saturated at 5 feet   | --                   | Cyanide analysis omitted.                                        | Soil Core         |                    | X               |             |               |          |                             | X               | X     | X    | X      |         |          |                          |                      |                      |      |                 |                    |       |      |        | Y       | State of Michigan |                    |
| QMCP-GW64                  | 9/7/2018    | QMCP-GW 64 5-9'                            | 1809086                      | -88.5546749 | 47.1258830 | Data Gap - Area F, proximal to historic filling station/tank farm                    |                                                      | --                   |                                                                  | Low-Flow Sampling |                    |                 | X           |               |          |                             | X               | X     | X    | X      |         |          | 17.4                     | 0.710                | 5.1                  | 7.13 | NM              |                    |       |      |        | Y       | State of Michigan |                    |

Table 3-1  
Sampling and Analysis Summary  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Proposed Sampling Location | Sample Date | Field Sample Identification                | Laboratory Work Order Number | Longitude   | Latitude   | Sampling Rationale                                                                  | Sample Description                                         | Friable/ Non-Friable | Sample Notes                              | Sampling Method   | Sample Type/Matrix |                 |             |               |          |                             | Sample Analyses |       |      |        |         |          | Water Quality Parameters |                      |                      |    |                 | Duplicate Analyses |       |      |        |                    | Property Ownership |            |
|----------------------------|-------------|--------------------------------------------|------------------------------|-------------|------------|-------------------------------------------------------------------------------------|------------------------------------------------------------|----------------------|-------------------------------------------|-------------------|--------------------|-----------------|-------------|---------------|----------|-----------------------------|-----------------|-------|------|--------|---------|----------|--------------------------|----------------------|----------------------|----|-----------------|--------------------|-------|------|--------|--------------------|--------------------|------------|
|                            |             |                                            |                              |             |            |                                                                                     |                                                            |                      |                                           |                   | Surface Soil       | Subsurface Soil | Groundwater | Surface Water | Sediment | Drums, Containers, and SACM | VOCs            | SVOCs | PCBs | Metals | Cyanide | Asbestos | Temperature (C°)         | Conductivity (mS/cm) | Dissolved Oxygen (%) | pH | Turbidity (nTu) | VOCs               | SVOCs | PCBs | Metals | Cyanide            |                    | Trail ROW  |
| Area H                     |             |                                            |                              |             |            |                                                                                     |                                                            |                      |                                           |                   |                    |                 |             |               |          |                             |                 |       |      |        |         |          |                          |                      |                      |    |                 |                    |       |      |        |                    |                    |            |
| QMCP-SB53                  |             | QMCP-SB53 a <sub>1</sub> -b <sub>1</sub> " |                              | -88.5488116 | 47.1252472 | Data Gap - Area H, proximal to GP-1 (6/13/2002)                                     |                                                            | --                   | Location not sampled.                     | Soil Core         | X                  |                 |             |               |          |                             |                 |       |      |        |         |          |                          |                      |                      |    |                 |                    |       |      | N      | Wuebben Properties |                    |            |
|                            |             | QMCP-SB53 a <sub>2</sub> -b <sub>2</sub> " |                              |             |            | Data Gap - Area H, proximal to GP-1 (6/13/2002)                                     |                                                            | --                   | Location not sampled.                     | Soil Core         | X                  |                 |             |               |          |                             |                 |       |      |        |         |          |                          |                      |                      |    |                 |                    |       |      | N      | Wuebben Properties |                    |            |
| QMCP-SB54                  |             | QMCP-SB54 a <sub>1</sub> -b <sub>1</sub> " |                              | -88.5488836 | 47.1244346 | Data Gap - Area H, proximal to GP-4, GP-5 (6/13/2002)                               |                                                            | --                   | Location not sampled.                     | Soil Core         | X                  |                 |             |               |          |                             |                 |       |      |        |         |          |                          |                      |                      |    |                 |                    |       |      | N      | Wuebben Properties |                    |            |
|                            |             | QMCP-SB54 a <sub>2</sub> -b <sub>2</sub> " |                              |             |            | Data Gap - Area H, proximal to GP-4, GP-5 (6/13/2002)                               |                                                            | --                   | Location not sampled.                     | Soil Core         | X                  |                 |             |               |          |                             |                 |       |      |        |         |          |                          |                      |                      |    |                 |                    |       |      | N      | Wuebben Properties |                    |            |
| QMCP-SB55                  |             | QMCP-SB55 a <sub>1</sub> -b <sub>1</sub> " |                              | -88.5479865 | 47.1238867 | Data Gap - Area H                                                                   |                                                            | --                   | Location not sampled.                     | Soil Core         | X                  |                 |             |               |          |                             |                 |       |      |        |         |          |                          |                      |                      |    |                 |                    |       |      | N      | Wuebben Properties |                    |            |
|                            |             | QMCP-SB55 a <sub>2</sub> -b <sub>2</sub> " |                              |             |            | Data Gap - Area H                                                                   |                                                            | --                   | Location not sampled.                     | Soil Core         | X                  |                 |             |               |          |                             |                 |       |      |        |         |          |                          |                      |                      |    |                 |                    |       |      | N      | Wuebben Properties |                    |            |
| QMCP-GW53                  |             | QMCP-GW53 a <sub>1</sub> -b <sub>1</sub> " |                              | -88.5488116 | 47.1252472 | Data Gap - Area H, proximal to GP-1 (6/13/2002)                                     |                                                            | --                   | Location not sampled.                     | Low-Flow Sampling |                    | X               |             |               |          |                             |                 |       |      |        |         |          |                          |                      |                      |    |                 |                    |       |      | N      | Wuebben Properties |                    |            |
| QMCP-GW54                  |             | QMCP-GW54 a <sub>1</sub> -b <sub>1</sub> " |                              | -88.5488836 | 47.1244346 | Data Gap - Area H, proximal to GP-4, GP-5 (6/13/2002)                               |                                                            | --                   | Location not sampled.                     | Low-Flow Sampling |                    | X               |             |               |          |                             |                 |       |      |        |         |          |                          |                      |                      |    |                 |                    |       |      | N      | Wuebben Properties |                    |            |
| QMCP-GW55                  |             | QMCP-GW55 a <sub>1</sub> -b <sub>1</sub> " |                              | -88.5479865 | 47.1238867 | Data Gap - Area H                                                                   |                                                            | --                   | Location not sampled.                     | Low-Flow Sampling |                    | X               |             |               |          |                             |                 |       |      |        |         |          |                          |                      |                      |    |                 |                    |       |      | N      | Wuebben Properties |                    |            |
| Area J                     |             |                                            |                              |             |            |                                                                                     |                                                            |                      |                                           |                   |                    |                 |             |               |          |                             |                 |       |      |        |         |          |                          |                      |                      |    |                 |                    |       |      |        |                    |                    |            |
| QMCP-SS266                 |             | QMCP-SS266-0-3"                            |                              | -88.5448985 | 47.1240380 | North of H & Y Marina B-19, PCB detection, arsenic, lead, and manganese exceedances |                                                            | --                   | Location not sampled.                     | Hand Tools        | X                  |                 |             |               |          |                             |                 |       |      |        |         |          |                          |                      |                      |    |                 |                    |       |      | N      | H&Y Marina         |                    |            |
| QMCP-SS267                 |             | QMCP-SS267-0-3"                            |                              | -88.5448959 | 47.1239832 | South of H & Y Marina B-19, PCB detection, arsenic, lead, and manganese exceedances |                                                            | --                   | Location not sampled.                     | Hand Tools        | X                  |                 |             |               |          |                             |                 |       |      |        |         |          |                          |                      |                      |    |                 |                    |       |      | N      | H&Y Marina         |                    |            |
| QMCP-SS268                 |             | QMCP-SS268-0-3"                            |                              | -88.5448570 | 47.1240115 | East of H & Y Marina B-19, PCD detection, arsenic, lead, and manganese exceedances  |                                                            | --                   | Location not sampled.                     | Hand Tools        | X                  |                 |             |               |          |                             |                 |       |      |        |         |          |                          |                      |                      |    |                 |                    |       |      | N      | H&Y Marina         |                    |            |
| QMCP-SS269                 |             | QMCP-SS269-0-3"                            |                              | -88.5449374 | 47.1240097 | West of H & Y Marina B-19, PCB detection, arsenic, lead, and manganese exceedances  |                                                            | --                   | Location not sampled.                     | Hand Tools        | X                  |                 |             |               |          |                             |                 |       |      |        |         |          |                          |                      |                      |    |                 |                    |       |      | N      | H&Y Marina         |                    |            |
| Area M                     |             |                                            |                              |             |            |                                                                                     |                                                            |                      |                                           |                   |                    |                 |             |               |          |                             |                 |       |      |        |         |          |                          |                      |                      |    |                 |                    |       |      |        |                    |                    |            |
| QMCP-SS22                  | 9/6/2018    | QMCP-SS-22-0-6"                            | 1809080                      | -88.5030825 | 47.1173416 | Data Gap - Area M                                                                   | Dark brown TOPSOIL to 5", then brown fine to medium SAND   | --                   | Duplicate collected: QMCP-SS-22-0-6" DUP3 | Hand Tools        | X                  |                 |             |               |          |                             | X               |       | X    | X      |         |          |                          |                      |                      |    |                 |                    | X     |      | X      | X                  | N                  | Lois Stout |
| QMCP-SS23                  | 9/6/2018    | QMCP-SS-23-0-6"                            | 1809080                      | -88.5033041 | 47.1167080 | Data Gap - Area M                                                                   | Brown fine to medium SAND                                  | --                   |                                           | Hand Tools        | X                  |                 |             |               |          |                             | X               |       | X    | X      |         |          |                          |                      |                      |    |                 |                    |       |      |        | N                  | Lois Stout         |            |
| QMCP-SS24                  | 9/6/2018    | QMCP-SS-24-0-6"                            | 1809080                      | -88.5027590 | 47.1157938 | Data Gap - Area M                                                                   | Brown/black to red very fine to fine SAND with some gravel | --                   |                                           | Hand Tools        | X                  |                 |             |               |          |                             | X               |       | X    | X      |         |          |                          |                      |                      |    |                 |                    |       |      |        | N                  | Osceola Twp.       |            |
| QMCP-SS25                  | 9/6/2018    | QMCP-SS-25-0-6"                            | 1809080, 240-100981-1        | -88.5017602 | 47.1156862 | Data Gap - Area M                                                                   | Dark brown fine to medium SAND                             | --                   | Asbestos in soil analysis.                | Hand Tools        | X                  |                 |             |               |          |                             | X               |       | X    | X      | X       |          |                          |                      |                      |    |                 |                    |       |      |        | N                  | Lois Stout         |            |
| QMCP-SS26                  | 9/6/2018    | QMCP-SS-26-0-6"                            | 1809080, 240-100981-1        | -88.5013573 | 47.1162314 | Data Gap - Area M, near historic smelter building                                   | Dark brown/black TOPSOIL, organics and slag/metal bits     | --                   | Asbestos in soil analysis.                | Hand Tools        | X                  |                 |             |               |          |                             | X               |       | X    | X      | X       |          |                          |                      |                      |    |                 |                    |       |      |        | N                  | Lois Stout         |            |
| QMCP-SB37                  | 9/11/2018   | QMCP-SB37 0-6"                             | 1809120                      | -88.5034322 | 47.1157449 | Data Gap - Area M, within historic mining operation location                        | SAND, Fine to medium, brown, saturated at 5 feet           | --                   | Cyanide analysis omitted.                 | Soil Core         |                    | X               |             |               |          |                             | X               | X     | X    | X      |         |          |                          |                      |                      |    |                 |                    |       |      | N      | Lois Stout         |                    |            |
|                            | 9/11/2018   | QMCP-SB37 6"-5'                            | 1809120                      |             |            | Data Gap - Area M, within historic mining operation location                        | SAND, Fine to medium, brown, saturated at 5 feet           | --                   | Cyanide analysis omitted.                 | Soil Core         |                    | X               |             |               |          |                             | X               | X     | X    | X      |         |          |                          |                      |                      |    |                 |                    |       |      | N      | Lois Stout         |                    |            |

Table 3-1  
Sampling and Analysis Summary  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Proposed Sampling Location | Sample Date | Field Sample Identification | Laboratory Work Order Number | Longitude   | Latitude   | Sampling Rationale                                               | Sample Description                                         | Friable/ Non-Friable | Sample Notes                                 | Sampling Method   | Sample Type/Matrix |                 |             |               |          | Sample Analyses             |      |       |      |        | Water Quality Parameters |          |                  |                      |                      | Duplicate Analyses |                 |      |       |      | Property Ownership |        |                   |                   |
|----------------------------|-------------|-----------------------------|------------------------------|-------------|------------|------------------------------------------------------------------|------------------------------------------------------------|----------------------|----------------------------------------------|-------------------|--------------------|-----------------|-------------|---------------|----------|-----------------------------|------|-------|------|--------|--------------------------|----------|------------------|----------------------|----------------------|--------------------|-----------------|------|-------|------|--------------------|--------|-------------------|-------------------|
|                            |             |                             |                              |             |            |                                                                  |                                                            |                      |                                              |                   | Surface Soil       | Subsurface Soil | Groundwater | Surface Water | Sediment | Drums, Containers, and SACM | VOCs | SVOCs | PCBs | Metals | Cyanide                  | Asbestos | Temperature (C°) | Conductivity (mS/cm) | Dissolved Oxygen (%) | pH                 | Turbidity (nTu) | VOCs | SVOCs | PCBs |                    | Metals | Cyanide           | Trail ROW         |
| Area M (Continued)         |             |                             |                              |             |            |                                                                  |                                                            |                      |                                              |                   |                    |                 |             |               |          |                             |      |       |      |        |                          |          |                  |                      |                      |                    |                 |      |       |      |                    |        |                   |                   |
| QMCP-SB38                  | 9/11/2018   | QMCP-SB38 0-6"              | 1809120                      | -88.5022596 | 47.1152597 | Data Gap - Area M, within historic mining operation location     | SAND, Medium, brown                                        | --                   | Cyanide analysis omitted.                    | Soil Core         |                    | X               |             |               |          |                             | X    | X     | X    | X      |                          |          |                  |                      |                      |                    |                 |      |       |      |                    |        | N                 | Lois Stout        |
|                            | 9/11/2018   | QMCP-SB38 6"-5'             | 1809120                      |             |            | Data Gap - Area M, within historic mining operation location     | SAND, Medium to coarse, brown, saturated at 5 feet         | --                   | Cyanide analysis omitted.                    | Soil Core         |                    | X               |             |               |          |                             | X    | X     | X    | X      |                          |          |                  |                      |                      |                    |                 |      |       |      |                    |        | N                 | Lois Stout        |
| QMCP-SB39                  | 9/11/2018   | QMCP-SB39 0-6"              | 1809120                      | -88.5020364 | 47.1159543 | Data Gap - Area M, proximal to underground oil house             | SAND, Fine, gray                                           | --                   | Cyanide analysis omitted.                    | Soil Core         |                    | X               |             |               |          |                             | X    | X     | X    | X      |                          |          |                  |                      |                      |                    |                 |      |       |      |                    |        | N                 | Osceola Twp.      |
|                            | 9/11/2018   | QMCP-SB39 6"-8'             | 1809120                      |             |            | Data Gap - Area M, proximal to underground oil house             | FILL, Gravel, and SAND, Medium, brown, saturated at 8 feet | --                   | Cyanide analysis omitted.                    | Soil Core         |                    | X               |             |               |          |                             | X    | X     | X    | X      |                          |          |                  |                      |                      |                    |                 |      |       |      |                    |        | N                 | Osceola Twp.      |
| QMCP-SB40                  | 9/10/2018   | QMCP-SB40 0-6"              | 1809100                      | -88.5012057 | 47.1158847 | Data Gap - Area M, within historic footprint of smelter building | SAND, Medium to coarse, gray                               | --                   | Cyanide analysis omitted.                    | Soil Core         |                    | X               |             |               |          |                             | X    | X     | X    | X      |                          |          |                  |                      |                      |                    |                 |      |       |      |                    |        | N                 | Lois Stout        |
|                            | 9/10/2018   | QMCP-SB40 6"-5'             | 1809100                      |             |            | Data Gap - Area M, within historic footprint of smelter building | SAND, Medium to coarse, gray                               | --                   | Cyanide analysis omitted. Duplicate omitted. | Soil Core         |                    | X               |             |               |          |                             | X    | X     | X    | X      |                          |          |                  |                      |                      |                    |                 |      |       |      |                    |        | N                 | Lois Stout        |
| QMCP-SB41                  | 9/10/2018   | QMCP-SB41 0-6"              | 1809100                      | -88.5010088 | 47.1166893 | Data Gap - Area M, within historic mining operation location     | SAND, Medium to coarse, gray                               | --                   | Cyanide analysis omitted.                    | Soil Core         |                    | X               |             |               |          |                             | X    | X     | X    | X      |                          |          |                  |                      |                      |                    |                 |      |       |      |                    |        | N                 | Lois Stout        |
|                            | 9/10/2018   | QMCP-SB41 6"-9'             | 1809100                      |             |            | Data Gap - Area M, within historic mining operation location     | SAND, Fine to medium, brown, saturated at 9 feet           | --                   | Cyanide analysis omitted.                    | Soil Core         |                    | X               |             |               |          |                             | X    | X     | X    | X      |                          |          |                  |                      |                      |                    |                 |      |       |      |                    |        | N                 | Lois Stout        |
| QMCP-SB42                  | 9/10/2018   | QMCP-SB42 0-6"              | 1809100                      | -88.5014653 | 47.1173806 | Data Gap - Area M, within historic mining operation location     | SAND, Medium to coarse, gray                               | --                   | Cyanide analysis omitted.                    | Soil Core         |                    | X               |             |               |          |                             | X    | X     | X    | X      |                          |          |                  |                      |                      |                    |                 |      |       |      |                    |        | N                 | Lois Stout        |
|                            | 9/10/2018   | QMCP-SB42 6"-12'            | 1809100                      |             |            | Data Gap - Area M, within historic mining operation location     | SAND, Medium to coarse, brown, saturated at 12 feet        | --                   | Cyanide analysis omitted.                    | Soil Core         |                    | X               |             |               |          |                             | X    | X     | X    | X      |                          |          |                  |                      |                      |                    |                 |      |       |      |                    |        | N                 | Lois Stout        |
| QMCP-GW37                  | 9/11/2018   | QMCP-GW37 5-9               | 1809119                      | -88.5034322 | 47.1157449 | Data Gap - Area M, within historic mining operation location     |                                                            | --                   |                                              | Low-Flow Sampling |                    |                 | X           |               |          |                             | X    | X     | X    | X      |                          |          | 13.5             | 0.235                | 40.1                 | 7.42               | NM              |      |       |      |                    |        | N                 | Lois Stout        |
| QMCP-GW38                  | 9/11/2018   | QMCP-GW38 5-9               | 1809119                      | -88.5022596 | 47.1152597 | Data Gap - Area M, within historic mining operation location     |                                                            | --                   |                                              | Low-Flow Sampling |                    |                 | X           |               |          |                             | X    | X     | X    | X      |                          |          | 14.6             | 0.256                | 13.0                 | 6.89               | NM              |      |       |      |                    |        | N                 | Lois Stout        |
| QMCP-GW39                  | 9/11/2018   | QMCP-GW39 8-12'             | 1809119                      | -88.5020364 | 47.1159543 | Data Gap - Area M, proximal to underground oil house             |                                                            | --                   |                                              | Low-Flow Sampling |                    |                 | X           |               |          |                             | X    | X     | X    | X      |                          |          | 14.5             | 0.200                | 87.9                 | 7.35               | NM              |      |       |      |                    |        | N                 | Osceola Twp.      |
| QMCP-GW40                  | 9/10/2018   | QMCP-GW40 12-16             | 1809102                      | -88.5012057 | 47.1158847 | Data Gap - Area M, within historic footprint of smelter building |                                                            | --                   | Duplicate omitted.                           | Low-Flow Sampling |                    |                 | X           |               |          |                             | X    | X     | X    | X      |                          |          | 13.1             | 0.190                | 70.0                 | 6.48               | NM              |      |       |      |                    |        | N                 | Lois Stout        |
| QMCP-GW41                  | 9/10/2018   | QMCP-GW41 9-13              | 1809102                      | -88.5010088 | 47.1166893 | Data Gap - Area M, within historic mining operation location     |                                                            | --                   |                                              | Low-Flow Sampling |                    |                 | X           |               |          |                             | X    | X     | X    | X      |                          |          | 13.8             | 0.204                | 7.0                  | 6.79               | NM              |      |       |      |                    |        | N                 | Lois Stout        |
| QMCP-GW42                  | 9/10/2018   | QMCP-GW42 12-16             | 1809102                      | -88.5014653 | 47.1173806 | Data Gap - Area M, within historic mining operation location     |                                                            | --                   |                                              | Low-Flow Sampling |                    |                 | X           |               |          |                             | X    | X     | X    | X      |                          |          | 13.9             | 0.103                | 39.7                 | 7.28               | NM              |      |       |      |                    |        | N                 | Lois Stout        |
| QMCP-ASBBLK58              | 10/01/2018  | QMCP-ASBBLK58A-100118       | 240-102329-1                 | -88.5016254 | 47.1170794 | Suspect ACM                                                      | Green roofing                                              | non-friable          |                                              | Hand Tools        |                    |                 |             |               |          | X                           |      |       |      |        |                          | X        |                  |                      |                      |                    |                 |      |       |      |                    | N      | Lois Stout        |                   |
|                            | 10/01/2018  | QMCP-ASBBLK58B-100118       | 240-102329-1                 |             |            | Suspect ACM                                                      | Green roofing                                              | non-friable          |                                              | Hand Tools        |                    |                 |             |               |          | X                           |      |       |      |        |                          | X        |                  |                      |                      |                    |                 |      |       |      |                    | N      | Lois Stout        |                   |
| In Lake - Surface Water    |             |                             |                              |             |            |                                                                  |                                                            |                      |                                              |                   |                    |                 |             |               |          |                             |      |       |      |        |                          |          |                  |                      |                      |                    |                 |      |       |      |                    |        |                   |                   |
| QMCP-SW01                  |             | QMCP-SW01 a-b'              |                              | -88.5693512 | 47.1256429 | Offshore from Area B (South)                                     |                                                            | --                   | Location not sampled.                        | Low-Flow Sampling |                    |                 |             | X             |          |                             |      |       |      |        |                          |          |                  |                      |                      |                    |                 |      |       |      |                    | N      | State of Michigan |                   |
| QMCP-SW02                  |             | QMCP-SW02 a-b'              |                              | -88.5667598 | 47.1254447 | Offshore from Area B (South)                                     |                                                            | --                   | Location not sampled.                        | Low-Flow Sampling |                    |                 |             | X             |          |                             |      |       |      |        |                          |          |                  |                      |                      |                    |                 |      |       |      |                    |        | N                 | State of Michigan |
| QMCP-SW03                  |             | QMCP-SW03 a-b'              |                              | -88.5590899 | 47.1244247 | Offshore from Area D                                             |                                                            | --                   | Location not sampled.                        | Low-Flow Sampling |                    |                 |             | X             |          |                             |      |       |      |        |                          |          |                  |                      |                      |                    |                 |      |       |      |                    |        | N                 | State of Michigan |
| QMCP-SW04                  |             | QMCP-SW04 a-b'              |                              | -88.5582963 | 47.1248768 | Offshore from Area D                                             |                                                            | --                   | Location not sampled.                        | Low-Flow Sampling |                    |                 |             | X             |          |                             |      |       |      |        |                          |          |                  |                      |                      |                    |                 |      |       |      |                    |        | N                 | State of Michigan |



Table 3-1  
Sampling and Analysis Summary  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Proposed Sampling Location                                          | Sample Date | Field Sample Identification | Laboratory Work Order Number | Longitude    | Latitude    | Sampling Rationale                                                                                | Sample Description                                     | Friable/ Non-Friable | Sample Notes          | Sampling Method   | Sample Type/Matrix |                 |             |               |          |                             | Sample Analyses |       |      |        |         |          | Water Quality Parameters |                      |                      |      |                 | Duplicate Analyses |       |      |        |         | Property Ownership |                   |
|---------------------------------------------------------------------|-------------|-----------------------------|------------------------------|--------------|-------------|---------------------------------------------------------------------------------------------------|--------------------------------------------------------|----------------------|-----------------------|-------------------|--------------------|-----------------|-------------|---------------|----------|-----------------------------|-----------------|-------|------|--------|---------|----------|--------------------------|----------------------|----------------------|------|-----------------|--------------------|-------|------|--------|---------|--------------------|-------------------|
|                                                                     |             |                             |                              |              |             |                                                                                                   |                                                        |                      |                       |                   | Surface Soil       | Subsurface Soil | Groundwater | Surface Water | Sediment | Drums, Containers, and SACM | VOCs            | SVOCs | PCBs | Metals | Cyanide | Asbestos | Temperature (C°)         | Conductivity (mS/cm) | Dissolved Oxygen (%) | pH   | Turbidity (nTu) | VOCs               | SVOCs | PCBs | Metals | Cyanide |                    | Trail ROW         |
| In Lake - Surface Water (Continued)                                 |             |                             |                              |              |             |                                                                                                   |                                                        |                      |                       |                   |                    |                 |             |               |          |                             |                 |       |      |        |         |          |                          |                      |                      |      |                 |                    |       |      |        |         |                    |                   |
| QMCP-SW05                                                           |             | QMCP-SW05 a-b'              |                              | -88.5580048  | 47.1255540  | Offshore from Area D                                                                              |                                                        | --                   | Location not sampled. | Low-Flow Sampling |                    |                 |             | X             |          |                             |                 |       |      |        |         |          |                          |                      |                      |      |                 |                    |       |      |        | N       | State of Michigan  |                   |
| QMCP-SW06                                                           |             | QMCP-SW06 a-b'              |                              | -88.5560179  | 47.1253390  | Offshore from Area E                                                                              |                                                        | --                   | Location not sampled. | Low-Flow Sampling |                    |                 |             | X             |          |                             |                 |       |      |        |         |          |                          |                      |                      |      |                 |                    |       |      |        | N       | State of Michigan  |                   |
| QMCP-SW07                                                           |             | QMCP-SW07 a-b'              |                              | -88.5521526  | 47.1250307  | Outlet of Ripley Creek, offshore from Area G                                                      |                                                        | --                   | Location not sampled. | Low-Flow Sampling |                    |                 |             | X             |          |                             |                 |       |      |        |         |          |                          |                      |                      |      |                 |                    |       |      |        | N       | State of Michigan  |                   |
| QMCP-SW08                                                           |             | QMCP-SW08 a-b'              |                              | -88.5462552  | 47.1233848  | Offshore from Area I                                                                              |                                                        | --                   | Location not sampled. | Low-Flow Sampling |                    |                 |             | X             |          |                             |                 |       |      |        |         |          |                          |                      |                      |      |                 |                    |       |      |        | N       | State of Michigan  |                   |
| QMCP-SW09                                                           |             | QMCP-SW09 a-b'              |                              | -88.5029253  | 47.1152426  | Offshore from Area M                                                                              |                                                        | --                   | Location not sampled. | Low-Flow Sampling |                    |                 |             | X             |          |                             |                 |       |      |        |         |          |                          |                      |                      |      |                 |                    |       |      |        | N       | State of Michigan  |                   |
| QMCP-SW10                                                           |             | QMCP-SW10 a-b'              |                              | -88.4998632  | 47.1135537  | Offshore from Area N                                                                              |                                                        | --                   | Location not sampled. | Low-Flow Sampling |                    |                 |             | X             |          |                             |                 |       |      |        |         |          |                          |                      |                      |      |                 |                    |       |      |        | N       | State of Michigan  |                   |
| QMCP-SW11                                                           |             | QMCP-SW11 a-b'              |                              | -88.4965812  | 47.1144752  | Offshore from Area N                                                                              |                                                        | --                   | Location not sampled. | Low-Flow Sampling |                    |                 |             | X             |          |                             |                 |       |      |        |         |          |                          |                      |                      |      |                 |                    |       |      |        | N       | State of Michigan  |                   |
| QMCP-SW12                                                           |             | QMCP-SW12 a-b'              |                              | -88.4959901  | 47.1179606  | Offshore from Area O                                                                              |                                                        | --                   | Location not sampled. | Low-Flow Sampling |                    |                 |             | X             |          |                             |                 |       |      |        |         |          |                          |                      |                      |      |                 |                    |       |      |        | N       | State of Michigan  |                   |
| QMCP-SW13                                                           |             | QMCP-SW13 a-b'              |                              | -88.4925184  | 47.1184816  | Outlet of creek, offshore from Area P                                                             |                                                        | --                   | Location not sampled. | Low-Flow Sampling |                    |                 |             | X             |          |                             |                 |       |      |        |         |          |                          |                      |                      |      |                 |                    |       |      |        | N       | State of Michigan  |                   |
| QMCP-SW14                                                           |             | QMCP-SW14 a-b'              |                              | -88.4963341  | 47.1136151  | Offshore of beach area                                                                            |                                                        | --                   | Location not sampled. | Low-Flow Sampling |                    |                 |             | X             |          |                             |                 |       |      |        |         |          |                          |                      |                      |      |                 |                    |       |      |        | N       | State of Michigan  |                   |
| In Lake - Pore Water, Sediments, and Submerged Drum Content Samples |             |                             |                              |              |             |                                                                                                   |                                                        |                      |                       |                   |                    |                 |             |               |          |                             |                 |       |      |        |         |          |                          |                      |                      |      |                 |                    |       |      |        |         |                    |                   |
| QMCP-PS02                                                           | 9/6/2018    | QMCP-PS02                   | 1809077                      | -88.56675225 | 47.12545041 | Collected near QMCP-SD02 where sediments indicated signs of contamination (sheen and/or odor)     | No odor or anything else remarkable noted. (GSS email) | --                   | Collected near SD02   | Low-Flow Sampling |                    |                 | X           |               |          |                             |                 | X     | X    | X      |         |          | 16.3                     | 1092                 | 0.1                  | 8.82 | 32.8            |                    |       |      |        |         | N                  | State of Michigan |
| QMCP-PS04                                                           | 9/12/2018   | QMCP-PS04                   | 1809097                      | -88.55834467 | 47.1250394  | Collected near QMCP-SD04 where sediments indicated signs of contamination (sheen and/or odor)     | No odor or anything else remarkable noted. (GSS email) | --                   | Collected near SD04   | Low-Flow Sampling |                    |                 | X           |               |          |                             |                 | X     | X    | X      |         |          | 16.1                     | 306.5                | 0.4                  | 7.33 | 28.2            |                    |       |      |        |         | N                  | State of Michigan |
| QMCP-PS05                                                           | 9/6/2018    | QMCP-PS05                   | 1809077                      | -88.55766583 | 47.12581048 | Collected near QMCP-SD05 where sediments indicated signs of contamination (sheen and/or odor)     | No odor or anything else remarkable noted. (GSS email) | --                   | Collected near SD05   | Low-Flow Sampling |                    |                 | X           |               |          |                             |                 | X     | X    | X      |         |          | 15.2                     | 1496                 | 0.8                  | 6.71 | 19.6            |                    |       |      |        |         | N                  | State of Michigan |
| QMCP-PS06                                                           | 9/6/2018    | QMCP-PS06                   | 1809077                      | -88.5562018  | 47.12506187 | Collected near QMCP-SD06 where sediments indicated signs of contamination (sheen and/or odor)     | No odor or anything else remarkable noted. (GSS email) | --                   | Collected near SD06   | Low-Flow Sampling |                    |                 | X           |               |          |                             |                 | X     | X    | X      |         |          | 17.5                     | 474                  | 0.1                  | 7.1  | 25              |                    |       |      |        |         | N                  | State of Michigan |
| QMCP-PS07                                                           | 9/6/2018    | QMCP-PS07                   | 1809077                      | -88.55219432 | 47.12503331 | Collected near QMCP-SD07 where sediments indicated signs of contamination (sheen and/or odor)     | No odor or anything else remarkable noted. (GSS email) | --                   | Collected near SD07   | Low-Flow Sampling |                    |                 | X           |               |          |                             |                 | X     | X    | X      |         |          | 17.6                     | 364.4                | 1                    | 6.81 | 9.48            |                    |       |      |        |         | N                  | State of Michigan |
| QMCP-PS10                                                           | 9/12/2018   | QMCP-PS10                   | 1809097                      | -88.49986642 | 47.11352579 | Collected near QMCP-SD10 where sediments indicated signs of contamination (sheen and/or odor)     | No odor or anything else remarkable noted. (GSS email) | --                   |                       | Low-Flow Sampling |                    |                 | X           |               |          |                             |                 | X     | X    | X      |         |          | 16.8                     | 224.4                | 1.3                  | 7.22 | 78.4            |                    |       |      |        |         | N                  | State of Michigan |
| QMCP-PS45                                                           | 9/12/2018   | QMCP-PS45                   | 1809097                      | -88.50117709 | 47.11380566 | Collected offshore of terrestrial location QMCP-SB45/GW45 that indicated potential contamination. | No odor or anything else remarkable noted. (GSS email) | --                   |                       | Low-Flow Sampling |                    |                 | X           |               |          |                             |                 | X     | X    | X      |         |          | 15.8                     | 490                  | 0.8                  | 6.94 | 37.6            |                    |       |      |        |         | N                  | State of Michigan |

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Sampling and Analysis Summary  
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| Proposed Sampling Location                                                      | Sample Date | Field Sample Identification                | Laboratory Work Order Number | Longitude    | Latitude    | Sampling Rationale                           | Sample Description                                                                          | Friable/ Non-Friable | Sample Notes                                                                                          | Sampling Method   | Sample Type/Matrix |                 |             |               |          | Sample Analyses             |      |       |      |        | Water Quality Parameters |          |                  |                      |                      | Duplicate Analyses |                 |      |       |      | Property Ownership |        |                   |
|---------------------------------------------------------------------------------|-------------|--------------------------------------------|------------------------------|--------------|-------------|----------------------------------------------|---------------------------------------------------------------------------------------------|----------------------|-------------------------------------------------------------------------------------------------------|-------------------|--------------------|-----------------|-------------|---------------|----------|-----------------------------|------|-------|------|--------|--------------------------|----------|------------------|----------------------|----------------------|--------------------|-----------------|------|-------|------|--------------------|--------|-------------------|
|                                                                                 |             |                                            |                              |              |             |                                              |                                                                                             |                      |                                                                                                       |                   | Surface Soil       | Subsurface Soil | Groundwater | Surface Water | Sediment | Drums, Containers, and SACM | VOCs | SVOCs | PCBs | Metals | Cyanide                  | Asbestos | Temperature (C°) | Conductivity (mS/cm) | Dissolved Oxygen (%) | pH                 | Turbidity (nTu) | VOCs | SVOCs | PCBs |                    | Metals | Cyanide           |
| In Lake - Pore Water, Sediments, and Submerged Drum Content Samples (Continued) |             |                                            |                              |              |             |                                              |                                                                                             |                      |                                                                                                       |                   |                    |                 |             |               |          |                             |      |       |      |        |                          |          |                  |                      |                      |                    |                 |      |       |      |                    |        |                   |
| QMCP-SD01                                                                       | 9/5/2018    | QMCP-SD01-0-6"                             | 1809079                      | -88.5693522  | 47.12561867 | Offshore from Area B (South)                 | FINES, Dark brown, loose, very soft                                                         | --                   |                                                                                                       | Vibracore Sampler |                    |                 |             |               | X        |                             |      | X     | X    | X      |                          |          |                  |                      |                      |                    |                 |      |       |      |                    | N      | State of Michigan |
|                                                                                 | 9/5/2018    | QMCP-SD01-6-26"                            | 1809079                      |              |             | Offshore from Area B (South)                 | SAND, Brown, fine grain, well sorted; SAND, Brown fine grain, well sorted, roots            | --                   | Metals analysis added.                                                                                | Vibracore Sampler |                    |                 |             |               | X        |                             |      | X     | X    | X      |                          |          |                  |                      |                      |                    |                 |      |       |      |                    | N      | State of Michigan |
| QMCP-SD02                                                                       | 9/5/2018    | QMCP-SD02-0-12"                            | 1809079                      | -88.56672473 | 47.12542612 | Offshore from Area B (South)                 | SAND with GRAVEL, Dark brown-black, coarse grain, some organics (wood and roots), oily odor | --                   | Duplicate collected: QMCP-SD02-0-12" FD                                                               | Vibracore Sampler |                    |                 |             |               | X        |                             |      | X     | X    | X      |                          |          |                  |                      |                      |                    |                 |      |       |      |                    | N      | State of Michigan |
|                                                                                 | 9/5/2018    | QMCP-SD02-12-21.5"                         | 1809079                      |              |             | Offshore from Area B (South)                 | FINES, Soft, few sands and gravel, wet                                                      | --                   | Metals analysis added.                                                                                | Vibracore Sampler |                    |                 |             |               | X        |                             |      | X     | X    | X      |                          |          |                  |                      |                      |                    |                 |      |       |      |                    | N      | State of Michigan |
| QMCP-SD03                                                                       | 9/5/2018    | QMCP-SD 03-0-6"                            | 1809083                      | -88.55908871 | 47.12441587 | Offshore from Area D                         | GRAVELLY SAND, Brownish purple, coarse grain sand, angular gravel                           | --                   |                                                                                                       | Vibracore Sampler |                    |                 |             |               | X        |                             |      | X     | X    | X      |                          |          |                  |                      |                      |                    |                 |      |       |      |                    | N      | State of Michigan |
|                                                                                 |             | QMCP-SD03 a <sub>2</sub> -b <sub>2</sub> ' |                              |              |             | Offshore from Area D                         |                                                                                             | --                   | Sample not collected.                                                                                 | Vibracore Sampler |                    |                 |             |               | X        |                             |      |       |      |        |                          |          |                  |                      |                      |                    |                 |      |       |      |                    | N      | State of Michigan |
| QMCP-SD04                                                                       | 9/5/2018    | QMCP-SD 04-0-4.5"                          | 1809083                      | -88.55827779 | 47.12487192 | Offshore from Area D                         | FINES, brown, trace gravel, very soft, oily sheen                                           | --                   |                                                                                                       | Vibracore Sampler |                    |                 |             |               | X        |                             |      | X     | X    | X      |                          |          |                  |                      |                      |                    |                 |      |       |      |                    | N      | State of Michigan |
|                                                                                 | 9/5/2018    | QMCP-SD 04-4.5-9"                          | 1809083                      |              |             | Offshore from Area D                         | SAND and FINES, brown, coarse grain, soft, loose                                            | --                   |                                                                                                       | Vibracore Sampler |                    |                 |             |               | X        |                             |      | X     | X    |        |                          |          |                  |                      |                      |                    |                 |      |       |      |                    | N      | State of Michigan |
| QMCP-SD05                                                                       | 9/5/2018    | QMCP-SD 05-0-6"                            | 1809083                      | -88.55801724 | 47.12555193 | Offshore from Area D                         | FINES, Brown soft, loose                                                                    | --                   |                                                                                                       | Vibracore Sampler |                    |                 |             |               | X        |                             |      | X     | X    | X      |                          |          |                  |                      |                      |                    |                 |      |       |      |                    | N      | State of Michigan |
|                                                                                 | 9/5/2018    | QMCP-SD 05-6-18"                           | 1809083                      |              |             | Offshore from Area D                         | CLAY, Brown, trace to some gravel, firm, strong sulfur odor; CLAY with wood debris          | --                   | Metals analysis added. Duplicate omitted.                                                             | Vibracore Sampler |                    |                 |             |               | X        |                             |      | X     | X    | X      |                          |          |                  |                      |                      |                    |                 |      |       |      |                    | N      | State of Michigan |
| QMCP-SD06                                                                       | 9/5/2018    | QMCP-SD 06-0-15"                           | 1809083                      | -88.55622784 | 47.12504701 | Offshore from Area E                         | SAND and GRAVEL, Coarse grain (stamp sands); SILTY SAND, Brown, fine to coarse grain, firm  | --                   | Duplicate collected: QMCP-SD 06-0-15" FD                                                              | Vibracore Sampler |                    |                 |             |               | X        |                             |      | X     | X    | X      |                          |          |                  |                      |                      |                    |                 |      | X     | X    | X                  | N      | State of Michigan |
|                                                                                 | 9/5/2018    | QMCP-SD 06-15-35"                          | 1809083                      |              |             | Offshore from Area E                         | SAND, Dark brown, coarse grain (stamp sands), trace organics, some fines 1.7-1.9ft          | --                   |                                                                                                       | Vibracore Sampler |                    |                 |             |               | X        |                             |      | X     | X    | X      |                          |          |                  |                      |                      |                    |                 |      |       |      |                    | N      | State of Michigan |
| QMCP-SD07                                                                       | 9/5/2018    | QMCP-SD 07-0-11"                           | 1809083                      | -88.55217782 | 47.12503516 | Outlet of Ripley Creek, offshore from Area G | SAND with GRAVEL, Dark brown-purple, coarse grain, some fines                               | --                   |                                                                                                       | Vibracore Sampler |                    |                 |             |               | X        |                             |      | X     | X    | X      |                          |          |                  |                      |                      |                    |                 |      |       |      |                    | N      | State of Michigan |
|                                                                                 |             | QMCP-SD07 a <sub>2</sub> -b <sub>2</sub> ' |                              |              |             | Outlet of Ripley Creek, offshore from Area G |                                                                                             | --                   | Sample not collected.                                                                                 | Vibracore Sampler |                    |                 |             |               | X        |                             |      |       |      |        |                          |          |                  |                      |                      |                    |                 |      |       |      |                    | N      | State of Michigan |
| QMCP-SD08                                                                       | 9/5/2018    | QMCP-SD 08-0-8"                            | 1809083                      | -88.54623293 | 47.12340147 | Offshore from Area I                         | FINES, Dark brown, organics/wood debris, soft                                               | --                   |                                                                                                       | Vibracore Sampler |                    |                 |             |               | X        |                             |      | X     | X    | X      |                          |          |                  |                      |                      |                    |                 |      |       |      |                    | N      | State of Michigan |
|                                                                                 | 9/5/2018    | QMCP-SD08-8-20"                            | 1809079                      |              |             | Offshore from Area I                         | SILT, Gray-brown, well sorted, firm, wet                                                    | --                   | Metals analysis added.                                                                                | Vibracore Sampler |                    |                 |             |               | X        |                             |      | X     | X    |        |                          |          |                  |                      |                      |                    |                 |      |       |      |                    | N      | State of Michigan |
| QMCP-SD09                                                                       | 9/6/2018    | QMCP-SD09-0-6"                             | 1809079                      | -88.50300745 | 47.11520776 | Offshore from Area M                         | SANDY GRAVEL, Dark brown, few fines and wood debris                                         | --                   |                                                                                                       | Vibracore Sampler |                    |                 |             |               | X        |                             |      | X     | X    | X      |                          |          |                  |                      |                      |                    |                 |      |       |      |                    | N      | State of Michigan |
|                                                                                 |             | QMCP-SD09 a <sub>2</sub> -b <sub>2</sub> ' |                              |              |             | Offshore from Area M                         |                                                                                             | --                   | Sample not collected.                                                                                 | Vibracore Sampler |                    |                 |             |               | X        |                             |      |       |      |        |                          |          |                  |                      |                      |                    |                 |      |       |      |                    | N      | State of Michigan |
| QMCP-SD10                                                                       | 9/6/2018    | QMCP-SD10-0-4"                             | 1809079                      | -88.499874   | 47.113501   | Offshore from Area N                         | FINES, Dark brown-black, organics (wood), soft, loose                                       | --                   | First core attempt in location was abandoned due to poor recovery; however, the fines had oily sheen. | Vibracore Sampler |                    |                 |             |               | X        |                             |      | X     | X    | X      |                          |          |                  |                      |                      |                    |                 |      |       |      |                    | N      | State of Michigan |
|                                                                                 | 9/6/2018    | QMCP-SD10-4-11"                            | 1809079                      |              |             | Offshore from Area N                         | SAND, Dark brown, medium grain, well sorted                                                 | --                   | Metals analysis added. Duplicate omitted.                                                             | Vibracore Sampler |                    |                 |             |               | X        |                             |      | X     | X    | X      |                          |          |                  |                      |                      |                    |                 |      |       |      |                    | N      | State of Michigan |
| QMCP-SD11                                                                       | 9/6/2018    | QMCP-SD11-0-6"                             | 1809079                      | -88.49667141 | 47.11454763 | Offshore from Area N                         | SAND, Dark brown, medium grain, well sorted                                                 | --                   |                                                                                                       | Vibracore Sampler |                    |                 |             |               | X        |                             |      | X     | X    | X      |                          |          |                  |                      |                      |                    |                 |      |       |      |                    | N      | State of Michigan |
|                                                                                 | 9/6/2018    | QMCP-SD11-6-12"                            | 1809082                      |              |             | Offshore from Area N                         | SAND, Dark brown, medium grain, some organics (roots), well sorted                          | --                   | Duplicate collected: QMCP-SD 11-6-12" FD                                                              | Vibracore Sampler |                    |                 |             |               | X        |                             |      | X     | X    | X      |                          |          |                  |                      |                      |                    |                 |      |       |      |                    | N      | State of Michigan |

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Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

| Proposed Sampling Location                                                      | Sample Date | Field Sample Identification | Laboratory Work Order Number | Longitude    | Latitude    | Sampling Rationale                                                                                      | Sample Description                                                                                                      | Friable/ Non-Friable | Sample Notes              | Sampling Method   | Sample Type/Matrix |                 |             |               |          |                             | Sample Analyses |       |      |        |         |          | Water Quality Parameters |                      |                      |    |                 | Duplicate Analyses |       |      |        |         | Property Ownership |                   |
|---------------------------------------------------------------------------------|-------------|-----------------------------|------------------------------|--------------|-------------|---------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|----------------------|---------------------------|-------------------|--------------------|-----------------|-------------|---------------|----------|-----------------------------|-----------------|-------|------|--------|---------|----------|--------------------------|----------------------|----------------------|----|-----------------|--------------------|-------|------|--------|---------|--------------------|-------------------|
|                                                                                 |             |                             |                              |              |             |                                                                                                         |                                                                                                                         |                      |                           |                   | Surface Soil       | Subsurface Soil | Groundwater | Surface Water | Sediment | Drums, Containers, and SACM | VOCs            | SVOCs | PCBs | Metals | Cyanide | Asbestos | Temperature (C°)         | Conductivity (mS/cm) | Dissolved Oxygen (%) | pH | Turbidity (nTu) | VOCs               | SVOCs | PCBs | Metals | Cyanide |                    | Trail ROW         |
| In Lake - Pore Water, Sediments, and Submerged Drum Content Samples (Continued) |             |                             |                              |              |             |                                                                                                         |                                                                                                                         |                      |                           |                   |                    |                 |             |               |          |                             |                 |       |      |        |         |          |                          |                      |                      |    |                 |                    |       |      |        |         |                    |                   |
| QMCP-SD12                                                                       | 9/6/2018    | QMCP-SD12-0-12"             | 1809082                      | -88.49596223 | 47.11793862 | Offshore from Area O                                                                                    | FINES, Brown, with organics (mostly in top 1 ft), cohesive, nonplastic, loose                                           | --                   |                           | Vibracore Sampler |                    |                 |             |               | X        |                             |                 | X     | X    | X      |         |          |                          |                      |                      |    |                 |                    |       |      |        |         | N                  | State of Michigan |
|                                                                                 | 9/6/2018    | QMCP-SD12-12-23"            | 1809082                      |              |             | Offshore from Area O                                                                                    | FINES, Brown, with organics (mostly in top 1 ft), cohesive, nonplastic, loose                                           | --                   | Metals analysis added.    | Vibracore Sampler |                    |                 |             |               | X        |                             |                 | X     | X    | X      |         |          |                          |                      |                      |    |                 |                    |       |      |        |         | N                  | State of Michigan |
| QMCP-SD13                                                                       | 9/7/2018    | QMCP-SD13-0-7"              | 1809082                      | -88.49253192 | 47.11852565 | Outlet of creek, offshore from Area P                                                                   | SAND, Dark brown, coarse grain, organics, trace gravel                                                                  | --                   |                           | Vibracore Sampler |                    |                 |             |               | X        |                             |                 | X     | X    | X      |         |          |                          |                      |                      |    |                 |                    |       |      |        |         | N                  | State of Michigan |
|                                                                                 | 9/7/2018    | QMCP-SD13-7-38"             | 1809082                      |              |             | Outlet of creek, offshore from Area P                                                                   | PEAT, Peat-like organics with fines; FINES, dark brown, pudding like texture, organics, cohesive, nonplastic, very soft | --                   | Metals analysis added.    | Vibracore Sampler |                    |                 |             |               | X        |                             |                 | X     | X    | X      |         |          |                          |                      |                      |    |                 |                    |       |      |        |         | N                  | State of Michigan |
| QMCP-SD14                                                                       | 9/7/2018    | QMCP-SD14-0-12"             | 1809082                      | -88.49607782 | 47.11364307 | Offshore of beach area                                                                                  | SAND, Dark brown, medium grain, well sorted, moist                                                                      | --                   |                           | Vibracore Sampler |                    |                 |             |               | X        |                             |                 | X     | X    | X      |         |          |                          |                      |                      |    |                 |                    |       |      |        |         | N                  | State of Michigan |
|                                                                                 | 9/7/2018    | QMCP-SD14-12-36"            | 1809082                      |              |             | Offshore of beach area                                                                                  | SAND, Brown, medium grain, well sorted, moist                                                                           | --                   | Metals analysis added.    | Vibracore Sampler |                    |                 |             |               | X        |                             |                 | X     | X    | X      |         |          |                          |                      |                      |    |                 |                    |       |      |        |         | N                  | State of Michigan |
| QMCP-SDM01                                                                      | 9/9/2018    | QMCP-SDM01                  | 1809098                      | -88.558      | 47.1256467  | Collected from drums located with SSS, observed with AUV-mounted video, and determined to have contents | Brown FINES, soft, with some organics (leaves), no odor                                                                 | --                   | Sampled at 12.66ft depth. | AUV Arm           |                    |                 |             |               | X        |                             |                 | X     | X    | X      |         |          |                          |                      |                      |    |                 |                    |       |      |        |         | N                  | State of Michigan |
| QMCP-SDM02                                                                      | 9/9/2018    | QMCP-SDM02                  | 1809098                      | -88.5575517  | 47.1255183  | Collected from drums located with SSS, observed with AUV-mounted video, and determined to have contents | Brown FINES, soft, with some organics (leaves), no odor                                                                 | --                   | Sampled at 14.82ft depth. | AUV Arm           |                    |                 |             |               | X        |                             |                 | X     | X    | X      |         |          |                          |                      |                      |    |                 |                    |       |      |        |         | N                  | State of Michigan |
| QMCP-SDM03                                                                      | 9/9/2018    | QMCP-SDM03                  | 1809098                      | -88.55821    | 47.1252983  | Collected from drums located with SSS, observed with AUV-mounted video, and determined to have contents | Brown FINES, soft, with some organics (leaves), no odor                                                                 | --                   | Sampled at 14.56ft depth. | AUV Arm           |                    |                 |             |               | X        |                             |                 | X     | X    | X      |         |          |                          |                      |                      |    |                 |                    |       |      |        |         | N                  | State of Michigan |

Notes:  
QMCP = Quincy Mining Company Mason Operations Area  
PCBs = Polychlorinated Biphenyls  
SACM = Suspect Asbestos Containing Material  
SVOCs = Semi-Volatile Organic Compounds  
VOCs = Volatile Organic Compounds  
AUV = Autonomous Underwater Vehicle  
ROW = Right of Way  
X = Completed sample based on the sampling rationale

NM = Not Measured  
-- = Not Applicable  
ft = feet  
°C = Degrees Celsius  
mS/cm = Milisiemens per centimeter  
% = Percentage  
nTU = Nephalometric Turbidity Units  
EGLE = Michigan Department of Environment, Great Lakes, and Energy

Total Sample Count 12 27 32 0 28 2 53 96 72 89 8 4 32 32 32 32 17 4 7 3 5 2  
Proposed Sample Count 16 54 46 14 31 2

For the purposes of this investigation, sediments include residues and waste material associated with chemical containers and deposits on the lake bottom historically discarded in Torch Lake and the Canal.  
In areas that have been resurfaced or capped, analytical samples were collected from directly beneath the cap/resurfacing medium (i.e. soil cap, beach sand, gravel, etc...) so that samples are representative of historical waste deposits.  
Samples described in this evaluation may actually refer to stamp sands or to other mining waste from the historic mining and reclamation processes conducted in the area.  
Evaluation based on EGLE Criteria at time of Project completion.

**APPENDIX A**

**SIDE SCAN SONAR IMAGERY**



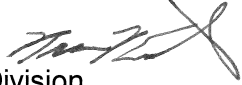
MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

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INTEROFFICE COMMUNICATION

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TO: Amy Keranen, Project Manager, Calumet Office  
Remediation and Redevelopment Division

FROM: Brian Eustice, Geologist, Geological Services Unit  
Program Support Section, Remediation and Redevelopment Division 

DATE: January 9, 2018

SUBJECT: Quincy Mining Company Portage, Houghton County, SITE ID #31000098  
Bathymetric Investigation-Side Scan Sonar

This memorandum summarizes the findings of a marine investigation requested by the Department of Environmental Quality (DEQ), Remediation and Redevelopment Division's (RRD's), Calumet office for the subject site. On August 18, 2017, RRD's Geological Services Unit (GSU) conducted side scan sonar surveys of three areas to identify potential targets for future investigation.

The three investigation areas are located in the Keweenaw Waterway offshore from the communities of Ripley and Dollar Bay, Section 36, T55N-R34W and Sections 31, 32 and 33, T55N-R33W, Houghton County, Michigan (Fig 1).

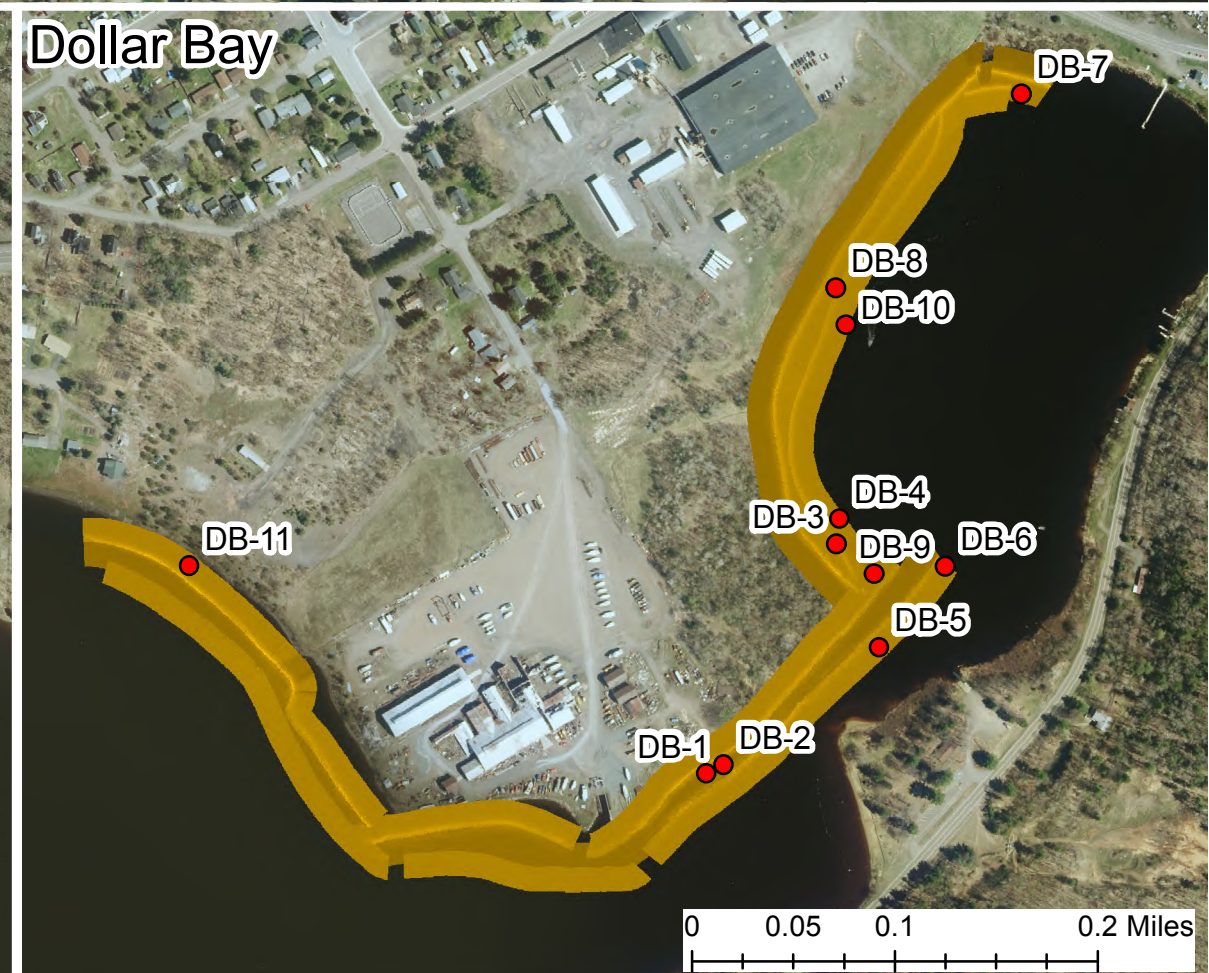
The GSU collected side scan sonar data using a Humminbird 797c<sup>2</sup> equipped with an external global positioning system (GPS) antenna. Potential targets were identified and selected during post processing using HYPACK 2016. Target locations for each investigation area are shown on Figure 1 and target coordinates are presented in Table 1.

If you have any questions, contact me at 517-242-1170.

Attachments

cc: Burrell P. Shirey, DEQ





## LEGEND

● Sidescan Sonar Targets

— Sidescan Sonar Tracks



DATUM - NAD83  
PROJECTION: MICHIGAN GEOREF

AERIAL PHOTO SOURCE: MIS PUBLIC IMAGERY  
BEST AVAILABLE MOSAIC



### Sidescan Sonar Survey of Ripley, Dollar Bay, and Former Coal Dock

FRANKLIN & OSCEOLA TOWNSHIPS, HOUGHTON COUNTY  
T55N R34W SECTION 36, T55N R33W SECTIONS 31, 32, 33

### SIDESCAN SONAR TARGET MAP

GEOLOGIST  
Brian Eustice  
Geological Services Unit  
Remediation and  
Redevelopment  
Division



CREATION DATE  
January 2018

FIGURE 1



| Target ID | X (Michigan GeoRef) | Y (Michigan GeoRef) | Latitude    | Longitude    |
|-----------|---------------------|---------------------|-------------|--------------|
| RP-1      | 25861646.2          | 857045.8            | 47.1232818  | -88.54664454 |
| RP-2      | 25861941.6          | 856900.2            | 47.12289849 | -88.5454468  |
| RP-3      | 25860596.4          | 857600.8            | 47.12474689 | -88.55090417 |
| RP-4      | 25860862.9          | 857505.2            | 47.12449913 | -88.54982636 |
| RP-5      | 25859161.2          | 857731              | 47.12502666 | -88.55667838 |
| RP-6      | 25858668.2          | 857548.5            | 47.12449985 | -88.55864392 |
| RP-7      | 25858413.9          | 857622.3            | 47.12468843 | -88.55967105 |
| RP-8      | 25858353.1          | 857892.7            | 47.12542635 | -88.5599366  |
| RP-9      | 25862741.2          | 857083.6            | 47.1234439  | -88.54224994 |
| RP-10     | 25861690.9          | 856992.1            | 47.12313699 | -88.54646081 |
| DB-1      | 25873771.8          | 853416.9            | 47.11397278 | -88.49767185 |
| DB-2      | 25873817.1          | 853439.8            | 47.1140379  | -88.49749169 |
| DB-3      | 25874109.1          | 854013.9            | 47.11562672 | -88.49636272 |
| DB-4      | 25874117.3          | 854079.3            | 47.11580641 | -88.49633475 |
| DB-5      | 25874221.9          | 853745.2            | 47.114896   | -88.49588941 |
| DB-6      | 25874393.9          | 853956.4            | 47.11548383 | -88.49521475 |
| DB-7      | 25874591.22         | 855186.18           | 47.11886506 | -88.49451551 |
| DB-8      | 25874107.6          | 854681.7            | 47.11745719 | -88.49641937 |
| DB-9      | 25874208            | 853936.2            | 47.11541885 | -88.4959597  |
| DB-10     | 25874134            | 854583.9            | 47.11719047 | -88.49630594 |
| DB-11     | 25872425.2          | 853957.3            | 47.11538423 | -88.50312011 |
| CD-1      | 25868754.4          | 854711.2            | 47.11725902 | -88.51791806 |
| CD-2      | 25868850            | 854693.9            | 47.11721662 | -88.51753284 |
| CD-3      | 25867565.9          | 855065.3            | 47.11816717 | -88.52271793 |

**APPENDIX B**

**UNDERWATER VIDEOS**



## Appendix B

The underwater videos are available here: [QMCP Torch Lake - YouTube](#)

## APPENDIX C

### **SITE INSPECTIONS – RECONNAISSANCE LOGS, TARGETED INSPECTIONS, & PHYSICAL HAZARDS INVENTORY**





APPENDIX C  
Reconnaissance, Targeted Sampling, and Potential Chemical and Physical Hazards Inventory  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

|                                       |                                                |
|---------------------------------------|------------------------------------------------|
| Area:                                 | B (from MDNR Trail property)                   |
| Property (Common Name):               | Houghton County Road Commission                |
| Property Identification Number/Owner: | 006-136-013-00/Houghton County Road Commission |
| Inspection Date:                      | 9/13/2018                                      |

**General Property Description (Significant Landscape Features, Topography, Cover, Etc.):**  
Review of the 1907 Sanborn Map indicates Lake Superior Iron Works operated in the southern portion of Area B. The site is identified as the Portage Lake Foundry and Machinery Company on the 1928 Sanborn Map and by 1949 was the location of the Houghton County Road Commission. The northern portion of Area B was identified as a Store House with additional dwellings in 1928 and the location of a filling station in 1949. Area B is currently the location of the Houghton County Road Commission. Observations of the Houghton County Road Commission property were made from the Copper Heritage Trail ROW that runs south of the property. This property is bound to the south by the trail and the Portage Canal. The ROW for Highway M-26 transects the property with a portion of the parcel located to the north of M-26. The Houghton County Marina is located to the west and the Quincy Smelting Works is located to the east. The property includes various buildings and garages, including storage locations that appear to be used for county road operations. Topography is relatively flat, sloping gently to the Portage Canal. Access to the property is restricted by fencing.

| Description                                                                                                                                                       |  | Notes:                                                                                                   |   | Potentially Abandoned Containers |            |                    |            |                 |                     |                  |                          |            |                        |            |                                         |                      |   | Batteries | Fire Extinguishers | Other Items | Suspect Asbestos Containing Material | Residual Process Material | Potential PCB/Mercury Containing Equipment | Waste Pile | Outfalls | Soil Staining/Stressed Vegetation | Physical Hazards | Field Sample Recommendation | Field Sampled 2018-2019 | Targeted Sample ID | Asbestos Friable/Non-friable | Container Count per Obs. Area | Recon Latitude | Recon Longitude | Observation Number |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----------------------------------------------------------------------------------------------------------|---|----------------------------------|------------|--------------------|------------|-----------------|---------------------|------------------|--------------------------|------------|------------------------|------------|-----------------------------------------|----------------------|---|-----------|--------------------|-------------|--------------------------------------|---------------------------|--------------------------------------------|------------|----------|-----------------------------------|------------------|-----------------------------|-------------------------|--------------------|------------------------------|-------------------------------|----------------|-----------------|--------------------|
|                                                                                                                                                                   |  |                                                                                                          |   | 1-25 gallon container            |            | 35-40 gallon drums |            | 55 gallon drums |                     | >55 gallon drums | ASTs/USTs 25-200 gallons |            | ASTs/USTs >200 gallons |            | Pressurized Vessel/Compressed Cylinders | Auto/Boat Fuel Tanks |   |           |                    |             |                                      |                           |                                            |            |          |                                   |                  |                             |                         |                    |                              |                               |                |                 |                    |
|                                                                                                                                                                   |  |                                                                                                          |   | Intact                           | Not Intact | Intact             | Not Intact | Intact          | Not Intact, carcass | Intact           | Intact                   | Not Intact | Intact                 | Not Intact |                                         |                      |   |           |                    |             |                                      |                           |                                            |            |          |                                   |                  |                             |                         |                    |                              |                               |                |                 |                    |
| 18-inch diameter corrugated metal pipe                                                                                                                            |  |                                                                                                          |   |                                  |            |                    |            |                 |                     |                  |                          |            |                        |            |                                         |                      |   |           | 1                  |             |                                      | N                         | N                                          |            |          | 0                                 | 47.12241853      | -88.5688609                 | Outfall002              |                    |                              |                               |                |                 |                    |
| Possible 6-inch diameter steel pipe                                                                                                                               |  |                                                                                                          |   |                                  |            |                    |            |                 |                     |                  |                          |            |                        |            |                                         |                      |   |           | 1                  |             |                                      | N                         | N                                          |            |          | 0                                 | 47.12583727      | -88.56854017                | Outfall003              |                    |                              |                               |                |                 |                    |
| Dead pine trees, Section of dead pine trees with live trees east and west of the subject area.                                                                    |  |                                                                                                          |   |                                  |            |                    |            |                 |                     |                  |                          |            |                        |            |                                         |                      |   |           |                    |             |                                      |                           |                                            |            |          |                                   |                  |                             |                         |                    |                              |                               |                |                 |                    |
| 8-inch diameter steel pipe                                                                                                                                        |  | Appears to transmit surface drainage from the Road Commission yard under the trail to the Portage Canal. |   |                                  |            |                    |            |                 |                     |                  |                          |            |                        |            |                                         |                      |   |           | 1                  |             |                                      | Y                         | N                                          |            |          | 0                                 | 47.1241365       | -88.57660247                | Outfall004              |                    |                              |                               |                |                 |                    |
| New 36 inch concrete end structure with rip rap                                                                                                                   |  |                                                                                                          |   |                                  |            |                    |            |                 |                     |                  |                          |            |                        |            |                                         |                      |   |           | 1                  |             |                                      | N                         | N                                          |            |          | 0                                 | 47.12563954      | -88.56754188                | Outfall005              |                    |                              |                               |                |                 |                    |
| 8-inch diameter plastic pipe                                                                                                                                      |  | Unknown origin                                                                                           |   |                                  |            |                    |            |                 |                     |                  |                          |            |                        |            |                                         |                      |   |           | 1                  |             |                                      | N                         | N                                          |            |          | 0                                 | 47.12553036      | -88.56685993                | Outfall006              |                    |                              |                               |                |                 |                    |
| Potentially oil stained soil originating from a hole next to a steel sign post adjacent to the Road Commission, crossing the trail, and down to the Portage Canal |  |                                                                                                          |   |                                  |            |                    |            |                 |                     |                  |                          |            |                        |            |                                         |                      |   |           |                    |             |                                      |                           |                                            |            |          |                                   |                  |                             |                         |                    |                              |                               |                |                 |                    |
| Steel tank, 36 inch diameter, 5 ft long                                                                                                                           |  | End intact but otherwise unknown integrity, unknown volume                                               |   |                                  |            |                    |            |                 |                     | 1                |                          |            |                        |            |                                         |                      |   |           |                    |             |                                      | Y                         | N                                          |            |          | 1                                 | 47.12241806      | -88.56734543                | Cont002                 |                    |                              |                               |                |                 |                    |
| 24-inch diameter concrete outfall structure                                                                                                                       |  |                                                                                                          |   |                                  |            |                    |            |                 |                     |                  |                          |            |                        |            |                                         |                      |   |           | 1                  |             |                                      | N                         | N                                          |            |          | 0                                 | 47.12561126      | -88.56547831                | Outfall007              |                    |                              |                               |                |                 |                    |
| Total Item Count:                                                                                                                                                 |  | 0                                                                                                        | 0 | 0                                | 0          | 0                  | 0          | 0               | 1                   | 0                | 0                        | 0          | 0                      | 0          | 0                                       | 0                    | 0 | 0         | 6                  | 2           | 0                                    |                           |                                            | 2          |          | 1                                 |                  |                             |                         |                    |                              |                               |                |                 |                    |



APPENDIX C  
Reconnaissance, Targeted Sampling, and Potential Chemical and Physical Hazards Inventory  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Area:

E (from MDNR Trail property)

Property (Common Name):

Property Identification Number/Owner:

006-168-004-00/MDNR  
Dianne Sprague

Inspection Date:

9/25/2018

**General Property Description (Significant Landscape Features, Topography, Cover, Etc.):** Historic land use and/or operations are unknown following review of available historic Sanborn Maps and other resources. The area is currently undeveloped and appears to be used for boat storage. In July 2018, a Michigan Department of Natural Resources (MDNR) surveyor observed potentially impacted soils within the ROW of the Hancock/Ripley Trail within Area E. Observations of this property were made from the Copper Heritage Trail that transects the property. The property contains one small cabin near the shoreline and contains evidence of flooding is apparent. Additional residential properties are located north of the MDNR trail. Apparent historic dump areas were observed near the Portage Canal, potentially exposed by June 2018 floodwaters.

| Description                                                                                                       |  | Notes: |   | Potentially Abandoned Containers |            |                    |            |                 |                     |                  |                          |            |                        | Batteries | Fire Extinguishers | Other Items | Suspect Asbestos Containing Material | Residual Process Material | Potential PCB/Mercury Containing Equipment | Waste Pile | Outfalls | Soil Staining/<br>Stressed Vegetation | Physical Hazards | Field Sample Recommendation | Field Sampled 2018-2019 | Targeted Sample ID | Asbestos Friable/Non-friable | Container Count per Obs. Area | Recon Latitude | Recon Longitude | Observation Number |                                             |                      |            |
|-------------------------------------------------------------------------------------------------------------------|--|--------|---|----------------------------------|------------|--------------------|------------|-----------------|---------------------|------------------|--------------------------|------------|------------------------|-----------|--------------------|-------------|--------------------------------------|---------------------------|--------------------------------------------|------------|----------|---------------------------------------|------------------|-----------------------------|-------------------------|--------------------|------------------------------|-------------------------------|----------------|-----------------|--------------------|---------------------------------------------|----------------------|------------|
|                                                                                                                   |  |        |   | 1-25 gallon container            |            | 35-40 gallon drums |            | 55 gallon drums |                     | >55 gallon drums | ASTs/USTs 25-200 gallons |            | ASTs/USTs >200 gallons |           |                    |             |                                      |                           |                                            |            |          |                                       |                  |                             |                         |                    |                              |                               |                |                 |                    | Pressurized Vessel/<br>Compressed Cylinders | Auto/Boat Fuel Tanks |            |
|                                                                                                                   |  |        |   | Intact                           | Not Intact | Intact             | Not Intact | Intact          | Not Intact, carcass |                  | Intact                   | Not Intact | Intact                 |           |                    |             |                                      |                           |                                            |            |          |                                       |                  |                             |                         |                    |                              |                               |                |                 |                    |                                             |                      | Not Intact |
| Not Intact = filled with scrap, appears or is visibly empty, carcass, major holes, rusted with holes, split seams |  |        |   |                                  |            |                    |            |                 |                     |                  |                          |            |                        |           |                    |             |                                      |                           |                                            |            |          |                                       |                  |                             |                         |                    |                              |                               |                |                 |                    |                                             |                      |            |
| Darkened, stained soil near residential burn barrel                                                               |  |        |   |                                  |            |                    |            |                 |                     |                  |                          |            |                        |           |                    |             |                                      |                           |                                            | 1          |          |                                       |                  | QMCP-SS08                   |                         |                    |                              | 47.126281000                  | -88.556008000  | --              |                    |                                             |                      |            |
| Evidence of waste pile with rusted metal debris, appears to household items unearthed by flooding                 |  |        |   |                                  |            |                    |            |                 |                     |                  |                          |            |                        |           |                    |             |                                      | 1                         |                                            |            |          |                                       |                  | QMCP-SS09                   |                         |                    |                              | 47.125579000                  | -88.556168000  | --              |                    |                                             |                      |            |
| Total Item Count:                                                                                                 |  | 0      | 0 | 0                                | 0          | 0                  | 0          | 0               | 0                   | 0                | 0                        | 0          | 0                      | 0         | 0                  | 0           | 0                                    | 0                         | 1                                          | 0          | 1        | 0                                     |                  | 2                           |                         | 0                  |                              |                               |                |                 |                    |                                             |                      |            |

APPENDIX C  
Reconnaissance, Targeted Sampling, and Potential Chemical and Physical Hazards Inventory  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Area:

F (from MDNR Trail property)

Property (Common Name):

Keweenaw Consignment & others

Property Identification Number/Owner:

006-167-013-00

Inspection Date:

9/25/2018

**General Property Description (Significant Landscape Features, Topography, Cover, Etc.):** A manufactured gas plant was in operation at the location of Area F, south of the Hancock/Ripley trail. Environmental concerns within this area have previously been addressed and further investigation as part of QMCP will not occur. A Filling Station and Bulk Oil Station that included various gasoline, kerosene, and fuel oil tanks, along with oil and oil pump houses operated within the northwestern portion of Area F, as identified on the 1949 Sanborn Map. This set of properties is bound to the north by the ROW for Highway M-26 and to the south by the Portage Canal. Keweenaw Consignment currently operates at the location north of the Hancock/Ripley trail, while a residential building and vacant lot are located to the south and east, respectively. A relatively undeveloped property that appears to be used for boat storage is located to the west, while Julio Contracting Company is located to the east. The ROW for the Copper Heritage Trail transects the area. A three bay garage in a fenced area is observed towards the southwest shoreline and MDNR monuments are located on the south side of the secured fence line. In addition, a residence is located to the south of the trail along the southeast shore. Hanke Auto Sales & Service operates in the vicinity of the former Filling Station and Bulk Oil Station to the northwest, north of the trail. Keweenaw Consignment is located to the east, followed by a vacant lot, all north of the trail. A culvert running parallel to trail, four stickup pipes, (two either side of trail) and a fire hydrant are all observed in the open space to the east of the area. Topography is relatively flat, sloping gently to the Portage Canal. This is an unsecured area easily accessed by the public via the trail.

| Description                                                              |  | Notes: |  | Potentially Abandoned Containers |            |                    |            |                 |                     |                  |                          |            |                        |            |                                         | Batteries | Fire Extinguishers | Other Items | Suspect Asbestos Containing Material | Residual Process Material | Potential PCB/Mercury Containing Equipment | Waste Pile | Outfalls | Soil Staining/Stressed Vegetation | Physical Hazards | Field Sample Recommendation | Field Sampled 2018-2019 | Targeted Sample ID | Asbestos Friable/Non-friable | Container Count per Obs. Area | Recon                |  | Observation Number |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |    |
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|                                                                          |  |        |  | 1-25 gallon container            |            | 35-40 gallon drums |            | 55 gallon drums |                     | >55 gallon drums | ASTs/USTs 25-200 gallons |            | ASTs/USTs >200 gallons |            | Pressurized Vessel/Compressed Cylinders |           |                    |             |                                      |                           |                                            |            |          |                                   |                  |                             |                         |                    |                              |                               | Auto/Boat Fuel Tanks |  |                    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |    |
|                                                                          |  |        |  | Intact                           | Not Intact | Intact             | Not Intact | Intact          | Not Intact, carcass | Intact           | Intact                   | Not Intact | Intact                 | Not Intact |                                         |           |                    |             |                                      |                           |                                            |            |          |                                   |                  |                             |                         |                    |                              |                               |                      |  |                    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |    |
| Household thermostat along trail, potentially Hg containing, soil filled |  |        |  |                                  |            |                    |            |                 |                     |                  |                          |            |                        |            |                                         |           |                    |             |                                      |                           |                                            |            |          |                                   |                  |                             |                         |                    |                              |                               |                      |  |                    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | </ |

APPENDIX C  
Reconnaissance, Targeted Sampling, and Potential Chemical and Physical Hazards Inventory  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Area:

H

Property (Common Name):

Wuebben Property: Dollar Bay Motorsports, Isle Royale Seaplanes, Wuebben Construction

Property Identification Number/Owner:

006-031-033-00/Jed Wuebben

Inspection Date:

9/25/2018

**General Property Description (Significant Landscape Features, Topography, Cover, Etc.,)** : Historic land use and/or operations are unknown following review of available historic Sanborn Maps and other resources. The area is currently the location of Dollar Bay Motor Sports, Isle Royale Seaplanes, and Wuebben Construction. Observations of this property were made from the Copper Heritage Trail ROW that transects the property. Buildings on the property appear to be used for commercial operations of the aforementioned businesses. The ROW for the trail transects the property, with a parking lot located north of the trail and business operations to the south of the trail.

| Description                                                                                                            |  | Notes: |   | Potentially Abandoned Containers |            |                    |            |                 |                     |                  |                          |            |                        |            |                                             |                      |   | Batteries | Fire Extinguishers | Other Items | Suspect Asbestos Containing Material | Residual Process Material | Potential PCB/Mercury Containing Equipment | Waste Pile | Outfalls | Soil Staining/<br>Stressed Vegetation | Physical Hazards | Field Sample Recommendation | Field Sampled 2018-2019 | Targeted Sample ID | Asbestos Friable/Non-friable | Container Count per Obs. Area | Recon Latitude | Recon Longitude | Observation Number |
|------------------------------------------------------------------------------------------------------------------------|--|--------|---|----------------------------------|------------|--------------------|------------|-----------------|---------------------|------------------|--------------------------|------------|------------------------|------------|---------------------------------------------|----------------------|---|-----------|--------------------|-------------|--------------------------------------|---------------------------|--------------------------------------------|------------|----------|---------------------------------------|------------------|-----------------------------|-------------------------|--------------------|------------------------------|-------------------------------|----------------|-----------------|--------------------|
|                                                                                                                        |  |        |   | 1-25 gallon container            |            | 35-40 gallon drums |            | 55 gallon drums |                     | >55 gallon drums | ASTs/USTs 25-200 gallons |            | ASTs/USTs >200 gallons |            | Pressurized Vessel/<br>Compressed Cylinders | Auto/Boat Fuel Tanks |   |           |                    |             |                                      |                           |                                            |            |          |                                       |                  |                             |                         |                    |                              |                               |                |                 |                    |
|                                                                                                                        |  |        |   | Intact                           | Not Intact | Intact             | Not Intact | Intact          | Not Intact, carcass |                  | Intact                   | Not Intact | Intact                 | Not Intact |                                             |                      |   |           |                    |             |                                      |                           |                                            |            |          |                                       |                  |                             |                         |                    |                              |                               |                |                 |                    |
| Not Intact = filled with scrap, appears or is visibly empty, carcass, major holes, rusted with holes, split seams      |  |        |   |                                  |            |                    |            |                 |                     |                  |                          |            |                        |            |                                             |                      |   |           |                    |             |                                      |                           |                                            |            |          |                                       |                  |                             |                         |                    |                              |                               |                |                 |                    |
| Potential items of environmental interest appear along the east property line and appear to be associated with Area I. |  |        |   |                                  |            |                    |            |                 |                     |                  |                          |            |                        |            |                                             |                      |   |           |                    |             |                                      |                           |                                            |            |          |                                       |                  |                             |                         |                    |                              | --                            |                |                 |                    |
| Total Item Count:                                                                                                      |  | 0      | 0 | 0                                | 0          | 0                  | 0          | 0               | 0                   | 0                | 0                        | 0          | 0                      | 0          | 0                                           | 0                    | 0 | 0         | 0                  | 0           | 0                                    | 0                         | 0                                          | 0          | 0        | 0                                     | 0                | 0                           | 0                       | 0                  |                              |                               |                |                 |                    |

APPENDIX C  
Reconnaissance, Targeted Sampling, and Potential Chemical and Physical Hazards Inventory  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Area:

J

Property (Common Name):

H&Y Marina

Property Identification Number/Owner:

006-031-036-00/H&Y Inc.

Inspection Date:

9/26/2018

**General Property Description (Significant Landscape Features, Topography, Cover, Etc.):** Area J was the location of the Houghton Lumber Yard Company and the Dollar Bay Lumber Company, according to the 1917 and 1928 Sanborn Maps, respectively. However, according to the 1949 Sanborn Map, Henry Borth Company Manufacturing R.R. Shims and UP Oil Company operated within the area. H&Y Marina currently operates at the location. This property is bound to the north by the ROW for Highway M-26 and to the south by the Portage Canal. A residential property is located to the east. The property includes one marina building, an unpaved parking lot and ring road, a boat launch, boat docks and various boat slips. Topography is relatively flat, sloping gently to the Portage Canal. Access is not restricted to the property. The area is easily accessed by the public via the ROW for the Copper Heritage Trail that transects the property.

| Description                                                                                                            |  | Notes: |  | Potentially Abandoned Containers |            |                    |            |                 |                     |                  |                          |            |                        |            |                                             | Batteries | Fire Extinguishers | Other Items | Suspect Asbestos Containing Material | Residual Process Material | Potential PCB/Mercury Containing Equipment | Waste Pile | Outfalls | Soil Staining/<br>Stressed Vegetation | Physical Hazards | Field Sample Recommendation | Field Sampled 2018-2019 | Targeted Sample ID | Asbestos Friable/Non-friable | Container Count per Obs. Area | Recon Latitude | Recon Longitude | Observation Number |                      |
|------------------------------------------------------------------------------------------------------------------------|--|--------|--|----------------------------------|------------|--------------------|------------|-----------------|---------------------|------------------|--------------------------|------------|------------------------|------------|---------------------------------------------|-----------|--------------------|-------------|--------------------------------------|---------------------------|--------------------------------------------|------------|----------|---------------------------------------|------------------|-----------------------------|-------------------------|--------------------|------------------------------|-------------------------------|----------------|-----------------|--------------------|----------------------|
|                                                                                                                        |  |        |  | 1-25 gallon container            |            | 35-40 gallon drums |            | 55 gallon drums |                     | >55 gallon drums | ASTs/USTs 25-200 gallons |            | ASTs/USTs >200 gallons |            | Pressurized Vessel/<br>Compressed Cylinders |           |                    |             |                                      |                           |                                            |            |          |                                       |                  |                             |                         |                    |                              |                               |                |                 |                    | Auto/Boat Fuel Tanks |
|                                                                                                                        |  |        |  | Intact                           | Not Intact | Intact             | Not Intact | Intact          | Not Intact, carcass | Intact           | Intact                   | Not Intact | Intact                 | Not Intact |                                             |           |                    |             |                                      |                           |                                            |            |          |                                       |                  |                             |                         |                    |                              |                               |                |                 |                    |                      |
| Not Intact = filled with scrap, appears or is visibly empty, carcass, major holes, rusted with holes, split seams      |  |        |  |                                  |            |                    |            |                 |                     |                  |                          |            |                        |            |                                             |           |                    |             |                                      |                           |                                            |            |          |                                       |                  |                             |                         |                    |                              |                               |                |                 |                    |                      |
| Potential items of environmental interest appear along the west property line and appear to be associated with Area I. |  |        |  |                                  |            |                    |            |                 |                     |                  |                          |            |                        |            |                                             |           |                    |             |                                      |                           |                                            |            |          |                                       |                  |                             |                         |                    |                              |                               | --             |                 |                    |                      |
| Total Item Count:                                                                                                      |  |        |  | 0                                | 0          | 0                  | 0          | 0               | 0                   | 0                | 0                        | 0          | 0                      | 0          | 0                                           | 0         | 0                  | 0           | 0                                    | 0                         | 0                                          | 0          | 0        | 0                                     | 0                | 0                           | 0                       | 0                  | 0                            | 0                             |                |                 |                    |                      |

APPENDIX C  
Reconnaissance, Targeted Sampling, and Potential Chemical and Physical Hazards Inventory  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Area:

Property along M-26 from H&Y Marina to K

Property (Common Name):

Mixed use, residential dwellings

Property Identification Number/Owner:

Various

Inspection Date:

9/27/2018

**General Property Description (Significant Landscape Features, Topography, Cover, Etc.):** Field inspectors did not acces these private properties. Observations were recorded from the public right of way. Various single-family residential houses and multi-family condominiums are located along this stretch of shoreline east of H&Y Marina to the Former Amoco Tank Farm. According to the 1907 Sanborn Map, Tamarack and Osceola Mining Company had mining operations at the location of Area K. By 1917, the location was the site of a Calumet and Hecla Mining Company Coal Dock. The area is currently the location of the Bayside Condominiums complex. The Copper Heritage Trail runs north of the properties, adjacent to the ROW for Highway M-26, and the Portage Canal bounds the properties to the south. The property located within Area K includes condominium buildings, with an additional building currently under construction and what appears to be a commerial garage building to the east. Topography is relatively flat, sloping gently to the Portage Canal. Access to the property is restricted by an electronic gate. The area is well-vegetated with trees and substantial grass coverage. No historic or mining era features were observed on the property during the inspection.

| Description |  | Notes: |  | Potentially Abandoned Containers |            |                    |            |                 |                     |                  |                          |            |                        |            |                                             |                      |  | Batteries | Fire Extinguishers | Other Items | Suspect Asbestos Containing Material | Residual Process Material | Potential PCB/Mercury Containing Equipment | Waste Pile | Outfalls | Soil Staining/<br>Stressed Vegetation | Physical Hazards | Field Sample Recommendation | Field Sampled 2018-2019 | Targeted Sample ID | Asbestos Friable/Non-friable | Container Count per Obs. Area | Recon Latitude | Recon Longitude | Observation Number |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |    |
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|             |  |        |  | 1-25 gallon container            |            | 35-40 gallon drums |            | 55 gallon drums |                     | >55 gallon drums | ASTs/USTs 25-200 gallons |            | ASTs/USTs >200 gallons |            | Pressurized Vessel/<br>Compressed Cylinders | Auto/Boat Fuel Tanks |  |           |                    |             |                                      |                           |                                            |            |          |                                       |                  |                             |                         |                    |                              |                               |                |                 |                    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |    |
|             |  |        |  | Intact                           | Not Intact | Intact             | Not Intact | Intact          | Not Intact, carcass |                  | Intact                   | Not Intact | Intact                 | Not Intact |                                             |                      |  |           |                    |             |                                      |                           |                                            |            |          |                                       |                  |                             |                         |                    |                              |                               |                |                 |                    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |    |
|             |  |        |  |                                  |            |                    |            |                 |                     |                  |                          |            |                        |            |                                             |                      |  |           |                    |             |                                      |                           |                                            |            |          |                                       |                  |                             |                         |                    |                              |                               |                |                 |                    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | </ |

APPENDIX C  
Reconnaissance, Targeted Sampling, and Potential Chemical and Physical Hazards Inventory  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

|                                       |                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
|---------------------------------------|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Area:                                 | M                                                        | <b>General Property Description (Significant Landscape Features, Topography, Cover, Etc.):</b><br>Lake Superior Smelting Company operated at the location, as identified on the 1928 Sanborn Map; however, only two ice houses remained at the property on the 1949 Sanborn Map. The EPA as part of the Torch Lake Superfund Site remedial action capped portions of Area M, N, and O. Dollar Bay Torch Lake EPA Superfund Site as-built drawings (USDA NRCS, 2004) indicate that the cap was placed as part of the Torch Lake Superfund Site Dollar Bay remedial action. The Fourth Five-Year Review Report for the Torch Lake Superfund Site (USEPA, 2018) indicated that construction was completed in 2002; however, the Dollar Bay parcel has not been deleted from the NPL. The capped areas are subject to an on-going DEQ O&M plan. The balance of the areas were not addressed as part of the Torch Lake Superfund Site remedial action. The area appears to be undeveloped with the exception of a building that houses two production wells for water supply to Dollar Bay. This area is bound to the north, west and east by residential properties and the Dollar Bay Wire Mill to the east-southeast. The Portage Canal bounds the southwest property line. A portion of the property is capped to the southeast. Remains of concrete foundations and piles of brick debris from the former smelter operations are observed in the central portion of the property and there is evidence of trespassers, including a camp and various fire rings along the shoreline. The wooded northern portion of the property slopes downward towards a more open area that is relatively flat. While the main access road is secured with a locked gate, the property is accessible by foot via various trails. |  |
| Property (Common Name):               | Dollar Bay Well Field                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| Property Identification Number/Owner: | 009-033-056-00/Lois Stout<br>009-033-057-00/Osceola Twp. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| Inspection Date:                      | 9/26/2018                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |

| Not Intact = filled with scrap, appears or is visibly empty, carcass, major holes, rusted with holes, split seams |                                      | Potentially Abandoned Containers |            |                    |            |                 |                     |                  |                          |            |                        |            |                                         |                      |   | Batteries | Fire Extinguishers | Other Items | Suspect Asbestos Containing Material | Residual Process Material | Potential PCB/Mercury Containing Equipment | Waste Pile | Outfalls | Soil Staining/Stressed Vegetation | Physical Hazards | Field Sample Recommendation | Field Sampled 2018-2019 |             | Asbestos Friable/Non-friable | Container Count per Obs. Area | Recon         |         | Observation Number | Recon Photo Location |
|-------------------------------------------------------------------------------------------------------------------|--------------------------------------|----------------------------------|------------|--------------------|------------|-----------------|---------------------|------------------|--------------------------|------------|------------------------|------------|-----------------------------------------|----------------------|---|-----------|--------------------|-------------|--------------------------------------|---------------------------|--------------------------------------------|------------|----------|-----------------------------------|------------------|-----------------------------|-------------------------|-------------|------------------------------|-------------------------------|---------------|---------|--------------------|----------------------|
|                                                                                                                   |                                      | 1-25 gallon container            |            | 35-40 gallon drums |            | 55 gallon drums |                     | >55 gallon drums | ASTs/USTs 25-200 gallons |            | ASTs/USTs >200 gallons |            | Pressurized Vessel/Compressed Cylinders | Auto/Boat Fuel Tanks |   |           |                    |             |                                      |                           |                                            |            |          |                                   |                  |                             |                         |             |                              |                               |               |         |                    |                      |
|                                                                                                                   |                                      | Intact                           | Not Intact | Intact             | Not Intact | Intact          | Not Intact, carcass |                  | Intact                   | Not Intact | Intact                 | Not Intact |                                         |                      |   |           |                    |             |                                      |                           |                                            |            |          |                                   |                  |                             |                         |             |                              |                               |               |         |                    |                      |
| Description                                                                                                       | Notes:                               |                                  |            |                    |            |                 |                     |                  |                          |            |                        |            |                                         |                      |   |           |                    |             |                                      |                           |                                            |            |          |                                   |                  |                             |                         |             |                              |                               |               |         |                    |                      |
| Rusted, crushed drum carcass, filled with foam board insulation and plastic jug                                   | Two fire extinguishers near "camp"   |                                  |            |                    |            |                 | 1                   |                  |                          |            |                        |            |                                         |                      | 2 |           |                    |             |                                      |                           |                                            |            |          |                                   | N                | N                           |                         |             | 1                            | 47.115442430                  | -88.502745088 | Cont117 |                    |                      |
| Rusted, crushed drum carcass, partially buried                                                                    |                                      |                                  |            |                    |            |                 | 1                   |                  |                          |            |                        |            |                                         |                      |   |           |                    |             |                                      |                           |                                            |            |          |                                   | N                | N                           |                         |             | 1                            | 47.115592870                  | -88.503012273 | Cont118 |                    |                      |
| Rusted, 40 gallon drum, open at end, appears empty                                                                |                                      |                                  |            |                    | 1          |                 |                     |                  |                          |            |                        |            |                                         |                      |   |           |                    |             |                                      |                           |                                            |            |          |                                   | N                | N                           |                         |             | 1                            | 47.116970811                  | -88.502655589 | Cont119 |                    |                      |
| Rusted 55 gallon drum, partially sunk in ground or potentially cut, filled with leaf litter, birch bark           |                                      |                                  |            |                    |            |                 | 1                   |                  |                          |            |                        |            |                                         |                      |   |           |                    |             |                                      |                           |                                            |            |          |                                   | N                | N                           |                         |             | 1                            | 47.116744172                  | -88.502499643 | Cont120 |                    |                      |
| Green roofing, trash filled drum near foundation                                                                  | Near raked ramp with trash scattered |                                  |            |                    |            |                 |                     |                  |                          |            |                        |            |                                         |                      |   |           |                    | 1           |                                      |                           |                                            |            |          |                                   | N                | Y                           | QMCP-ASBBLK58           | Non-Friable | 0                            | 47.117089311                  | -88.501612781 | SACM040 | 10/1/2018          |                      |
| Total Item Count:                                                                                                 |                                      | 0                                | 0          | 0                  | 1          | 0               | 3                   | 0                | 0                        | 0          | 0                      | 0          | 0                                       | 0                    | 2 | 0         |                    | 1           | 0                                    | 0                         | 0                                          | 0          | 0        |                                   |                  |                             | 1                       |             | 4                            |                               |               |         |                    |                      |



RECONNAISSANCE, TARGETED SAMPLING, AND POTENTIAL CHEMICAL AND PHYSICAL HAZARDS INVENTORY

APPENDIX C  
Reconnaissance, Targeted Sampling, and Potential Chemical and Physical Hazards Inventory  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Area:

O

Property (Common Name):

Horner Flooring

Property Identification Number/Owner:

009-033-052-00/Horner Acquisition

Inspection Date:

9/27/2018

**General Property Description (Significant Landscape Features, Topography, Cover, Etc.):** Field inspectors did not acces this private property. Observations were recorded from the public right of way. According to the 1907 Sanborn Map, Area O was the location of Dollar Bay Land and Improvement Company. The parcel is identified as Dollar Bay Lumber Company in 1917 and Dollar Bay Lumber Company Saw Mill and Lumber Yard and Horner Flooring Company Wood Flooring Mill in 1949. Horner Flooring Co. Inc., a manufacturer of hardwood maple basketball flooring, currently operates at the location. The EPA as part of the Torch Lake Superfund Site remedial action capped portions of Area M, N, and O. Dollar Bay Torch Lake EPA Superfund Site as-built drawings (USDA NRCS, 2004) indicate that the cap was placed as part of the Torch Lake Superfund Site Dollar Bay remedial action. The Fourth Five-Year Review Report for the Torch Lake Superfund Site (USEPA, 2018) indicated that construction was completed in 2002; however, the Dollar Bay parcel has not been deleted from the NPL. The capped areas are subject to an on-going DEQ O&M plan. The balance of the areas were not addressed as part of the Torch Lake Superfund Site remedial action. Topography is relatively flat, sloping gently to the Dollar Bay. The area appears to be well-vegetated with trees and substantial grass coverage to the south. Reconnaissance investigation is recommended.

| Description |  | Notes: |  | Potentially Abandoned Containers |            |                    |            |                 |                     |                  |  |                          |            |                        |            | Batteries | Fire Extinguishers | Other Items | Suspect Asbestos Containing Material | Residual Process Material | Potential PCB/Mercury Containing Equipment | Waste Pile | Outfalls | Soil Staining/Stressed Vegetation | Physical Hazards | Field Sample Recommendation | Field Sampled 2018-2019 | Targeted Sample ID | Asbestos Friable/Non-friable | Container Count per Obs. Area | Recon Latitude | Recon Longitude | Observation Number |                                         |                      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |    |
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|             |  |        |  | 1-25 gallon container            |            | 35-40 gallon drums |            | 55 gallon drums |                     | >55 gallon drums |  | ASTs/USTs 25-200 gallons |            | ASTs/USTs >200 gallons |            |           |                    |             |                                      |                           |                                            |            |          |                                   |                  |                             |                         |                    |                              |                               |                |                 |                    | Pressurized Vessel/Compressed Cylinders | Auto/Boat Fuel Tanks |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |    |
|             |  |        |  | Intact                           | Not Intact | Intact             | Not Intact | Intact          | Not Intact, carcass | Intact           |  | Intact                   | Not Intact | Intact                 | Not Intact |           |                    |             |                                      |                           |                                            |            |          |                                   |                  |                             |                         |                    |                              |                               |                |                 |                    |                                         |                      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |    |
|             |  |        |  |                                  |            |                    |            |                 |                     |                  |  |                          |            |                        |            |           |                    |             |                                      |                           |                                            |            |          |                                   |                  |                             |                         |                    |                              |                               |                |                 |                    |                                         |                      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | </ |

APPENDIX C  
Reconnaissance, Targeted Sampling, and Potential Chemical and Physical Hazards Inventory  
Quincy Mining Company Portage Operations Area  
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Area:

P

Property (Common Name):

Unknown

Property Identification Number/Owner:

Various

Inspection Date:

9/27/2018

**General Property Description (Significant Landscape Features, Topography, Cover, Etc.):** Field inspectors did not acces this private property. Observations were recorded from the public right of way. This area was not identified on available Sanborn Maps; however, review of Monette's Dollar Bay, Michigan, *Fifty-Fourth of a Local History Series* (Monette, 2000), indicates that the parcel was owned by Lake Superior Smelting Company and was used as a slag dump. Present day use appears to be a scrap/recycling facility called "The People's Store," and includes a residential and farm area to the east. Topography is relatively flat, sloping gently to the Dollar Bay. The area appears to be vegetated with tree coverage to the south, along Point Mills Road and more barren to the northwest. No historic or mining era features were observed on the property during the inspection.

| Description       |  | Notes: |   | Potentially Abandoned Containers |            |                    |            |                 |                     |                  |                          |            |                        |            |                                             | Batteries | Fire Extinguishers | Other Items | Suspect Asbestos Containing Material | Residual Process Material | Potential PCB/Mercury Containing Equipment | Waste Pile | Outfalls | Soil Staining/<br>Stressed Vegetation | Physical Hazards | Field Sample Recommendation | Field Sampled 2018-2019 | Targeted Sample ID | Asbestos Friable/Non-friable | Container Count per Obs. Area | Recon Latitude | Recon Longitude | Observation Number |                      |
|-------------------|--|--------|---|----------------------------------|------------|--------------------|------------|-----------------|---------------------|------------------|--------------------------|------------|------------------------|------------|---------------------------------------------|-----------|--------------------|-------------|--------------------------------------|---------------------------|--------------------------------------------|------------|----------|---------------------------------------|------------------|-----------------------------|-------------------------|--------------------|------------------------------|-------------------------------|----------------|-----------------|--------------------|----------------------|
|                   |  |        |   | 1-25 gallon container            |            | 35-40 gallon drums |            | 55 gallon drums |                     | >55 gallon drums | ASTs/USTs 25-200 gallons |            | ASTs/USTs >200 gallons |            | Pressurized Vessel/<br>Compressed Cylinders |           |                    |             |                                      |                           |                                            |            |          |                                       |                  |                             |                         |                    |                              |                               |                |                 |                    | Auto/Boat Fuel Tanks |
|                   |  |        |   | Intact                           | Not Intact | Intact             | Not Intact | Intact          | Not Intact, carcass | Intact           | Intact                   | Not Intact | Intact                 | Not Intact |                                             |           |                    |             |                                      |                           |                                            |            |          |                                       |                  |                             |                         |                    |                              |                               |                |                 |                    |                      |
|                   |  |        |   |                                  |            |                    |            |                 |                     |                  |                          |            |                        |            |                                             |           |                    |             |                                      |                           |                                            |            |          |                                       |                  |                             |                         |                    |                              |                               |                | --              |                    |                      |
| Total Item Count: |  | 0      | 0 | 0                                | 0          | 0                  | 0          | 0               | 0                   | 0                | 0                        | 0          | 0                      | 0          | 0                                           | 0         | 0                  | 0           | 0                                    | 0                         | 0                                          | 0          |          |                                       | 0                |                             | 0                       |                    |                              |                               |                |                 |                    |                      |

**APPENDIX D**

**PHOTOGRAPHIC LOG**





Photo 1: View of drums and containers with potential unknown contents, identified as Observation Number CONT001. Photo taken 9/13/2018.



Photo 2: View looking south of the open channel discharge to the Portage Canal identified as Observation Number Outfall001. Photo taken 9/13/2018.





Photo 1: View looking southeast of distressed pine trees, identified as Observation Number VEG001. Photo taken 9/13/2018.



Photo 2: View looking north of stained soils, identified as Observation Number Soil001. Photo taken 9/13/2018.



Photo 3: View of a partially buried steel tank along shoreline, identified as Observation Number CONT002. Photo taken 9/13/2018.





Photo 1: View looking southwest from the Trail ROW in Area E. Photo taken 9/25/2018.



Photo 2: View looking northwest from the Trail ROW in Area E. Photo taken 9/25/2018.



Photo 3: View of a culvert outlet north of the Trail ROW in Area E. Photo taken 9/25/2018.





Photo 1: View of a potential mercury containing household thermostat along Trail ROW, identified as Observation Number SHG004. Photo taken 9/25/2018.



Photo 2: View of soil with oily odor, mixed with concrete, debris, and branches pushed back along Trail ROW, sampled as QMCP-SS51. Photo taken 9/28/2018.





Photo 1: View of debris piles and building foundations near the central portion of the property. Photo taken 9/26/2018.



Photo 3: View of a crushed drum carcass filled with foam board insulation and a plastic jug, identified as Observation Number CONT117. Photo taken 9/26/2018.



Photo 2: View of green roofing material, sampled as QMCP-ASBBLK58. Photo taken 10/1/2018.

## APPENDIX E

### BORING LOGS



# SITE: AMW - Quincy Mining Company Portage

COUNTY: Houghton

DATE: 9-11-18

TOWNSHIP: Osceola

DRILLER: Zack Nichols

TOWN: 55N

GEOLOGIST: Jeff Pincumbe

RANGE: 34W

DRILL METHOD: Geoprobe

SECTION: 36

TOTAL DEPTH: 7 feet

LOCATION DESCRIPTION: Road Commision Area

ERNIE#: 31000098

| WELL<br>CONSTRUCTION | LITHOLOGIC<br>LOG | DESCRIPTION                                        | DEPTH | SAMPLE ID | SAMPLE TYPE | FIELD<br>SCREENING<br>RESULTS                | PID<br>ppm |
|----------------------|-------------------|----------------------------------------------------|-------|-----------|-------------|----------------------------------------------|------------|
|                      |                   |                                                    |       |           |             |                                              | 0 1000     |
|                      |                   | Grd.                                               | 0     |           |             | Soil sample collected<br>from 0 - 3'         |            |
|                      |                   | SAND<br>Fine to medium, brown, saturated at 3 feet |       |           |             |                                              |            |
|                      |                   |                                                    |       |           |             |                                              |            |
|                      |                   |                                                    |       |           |             |                                              |            |
|                      |                   | NO CUTTINGS                                        | 5     |           |             | Groundwater sample<br>collected from 3' - 7' |            |
|                      |                   |                                                    |       |           |             |                                              |            |
|                      |                   | E.O.B.                                             |       |           |             |                                              |            |
|                      |                   |                                                    | 10    |           |             |                                              |            |
|                      |                   |                                                    |       |           |             |                                              |            |
|                      |                   |                                                    |       |           |             |                                              |            |
|                      |                   |                                                    | 15    |           |             |                                              |            |
|                      |                   |                                                    |       |           |             |                                              |            |
|                      |                   |                                                    |       |           |             |                                              |            |
|                      |                   |                                                    | 20    |           |             |                                              |            |

VERTICAL DATUM: NA

GRD. ELEVATION: NA

T.O.C.: NA

S.W.L.: NA

CASING: NA

SCREEN: NA

WELL DEPTH: NA

COMPLETION NOTES: Backfilled with cuttings and bentonite

LATITUDE: 47.125720540

LONGITUDE: -88.597527240

DATUM: MichGeoRef

NORTHING: 733604.044

EASTING: 305116.171



**SITE: AMW - Quincy Mining Company Portage**

**BORING/WELL: SB/GW-20**

**COUNTY:** Houghton

**DATE:** 9-7-18

**TOWNSHIP:** Franklin

**DRILLER:** Zack Nichols

**TOWN: 55N**

**GEOLOGIST:** Jeff Pincumbe

**RANGE: 34W**

**DRILL METHOD:** Geoprobe

**SECTION: 36**

**TOTAL DEPTH: 9 feet**

**LOCATION DESCRIPTION:** Julio's Salvage Yard

**ERNIE#:** 31000098

[illegible]

VERTICAL DATUM: NA

**GRD. ELEVATION: NA**

**T.O.C.: NA**

S.W.L.: NA

**CASING: NA**

**SCREEN: NA**

WELL DEPTH: NA

**COMPLETION NOTES:** Backfilled with cuttings and bentonite

**LATITUDE: 47.126212080**

**LONGITUDE: -88.556371459**

**DATUM:** MichGeoRef

**NORTHING:** 733631.052

EASTING: 305963.736



## BOREHOLE LOG

**BORING/WELL: SB/GW-21**

**SITE: AMW - Quincy Mining Company Portage**

**COUNTY:** Houghton

**DATE:** 9-7-18

**TOWNSHIP:** Franklin

**DRILLER:** Zack Nichols

**TOWN: 55N**

**GEOLOGIST:** Jeff Pincumbe

**RANGE: 34W**

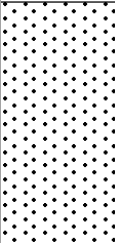
**DRILL METHOD:** Geoprobe

**SECTION: 36**

**TOTAL DEPTH: 8 feet**

**LOCATION DESCRIPTION:** Julio's Salvage Yard

**ERNIE#:** 31000098

| WELL<br>CONSTRUCTION | LITHOLOGIC<br>LOG                                                                 | DESCRIPTION                                          | DEPTH | SAMPLE ID | SAMPLE TYPE | FIELD<br>SCREENING<br>RESULTS                                                                                                                           | PID |      |
|----------------------|-----------------------------------------------------------------------------------|------------------------------------------------------|-------|-----------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
|                      |                                                                                   |                                                      |       |           |             |                                                                                                                                                         | 0   | 1000 |
|                      |                                                                                   | Grd.                                                 | 0     |           |             | 0 ppm<br>Soil samples collected<br>from 0 - 6" and 6" - 4'<br>0 ppm<br>0 ppm<br>0 ppm<br>0 ppm<br>0 ppm<br>Groundwater sample<br>collected from 4' - 8' |     |      |
|                      |  | SAND<br>Medium to coarse, brown, saturated at 4 feet |       |           |             |                                                                                                                                                         |     |      |
|                      |                                                                                   | NO CUTTINGS                                          | 5     |           |             |                                                                                                                                                         |     |      |
|                      |                                                                                   | E.O.B.                                               |       |           |             |                                                                                                                                                         |     |      |
|                      |                                                                                   |                                                      | 10    |           |             |                                                                                                                                                         |     |      |
|                      |                                                                                   |                                                      | 15    |           |             |                                                                                                                                                         |     |      |
|                      |                                                                                   |                                                      | 20    |           |             |                                                                                                                                                         |     |      |

VERTICAL DATUM: NA

**GRD. ELEVATION: NA**

**T.O.C.: NA**

**S.W.L.: NA**

**CASING: NA**

**SCREEN: NA**

WELL DEPTH: NA

**COMPLETION NOTES:** Backfilled with cuttings and bentonite

**LATITUDE: 47.125817750**

**LONGITUDE: -88.555948760**

DATUM: MichGeoRef

**NORTHING:** 733586.205

EASTING: 305994.357





**SITE: AMW - Quincy Mining Company Portage**

**BORING/WELL: SB/GW-37**

**COUNTY:** Houghton

**DATE:** 9-11-18

**TOWNSHIP:** Osceola

**DRILLER:** Zack Nichols

**TOWN: 55N**

**GEOLOGIST:** Jeff Pincumbe

**RANGE: 33W**

**DRILL METHOD:** Geoprobe

**SECTION: 33**

**TOTAL DEPTH: 9 feet**

**LOCATION DESCRIPTION:** Dollar Bay Well Field

**ERNIE#:** 31000098

| WELL<br>CONSTRUCTION | LITHOLOGIC<br>LOG | DESCRIPTION                                        | DEPTH | SAMPLE ID | SAMPLE TYPE | FIELD<br>SCREENING<br>RESULTS                                                                                                                                      | PID |      |
|----------------------|-------------------|----------------------------------------------------|-------|-----------|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
|                      |                   |                                                    |       |           |             |                                                                                                                                                                    | 0   | 1000 |
|                      |                   | Grd.                                               | 0     |           |             | 0 ppm    Soil samples collected<br>from 0 - 6" and 6" - 5'<br><br>0 ppm<br><br>0 ppm<br><br>0 ppm<br><br>0 ppm<br><br>Groundwater sample<br>collected from 5' - 9' |     |      |
|                      |                   | SAND<br>Fine to medium, brown, saturated at 5 feet |       |           |             |                                                                                                                                                                    |     |      |
|                      |                   | NO CUTTINGS                                        | 5     |           |             |                                                                                                                                                                    |     |      |
|                      |                   | E.O.B.                                             | 10    |           |             |                                                                                                                                                                    |     |      |
|                      |                   |                                                    | 15    |           |             |                                                                                                                                                                    |     |      |
|                      |                   |                                                    | 20    |           |             |                                                                                                                                                                    |     |      |

VERTICAL DATUM: NA

**GRD. ELEVATION: NA**

**T.O.C.: NA**

**S.W.L.: NA**

**CASING: NA**

**SCREEN: NA**

WELL DEPTH: NA

**COMPLETION NOTES:** Backfilled with cuttings and bentonite

**LATITUDE: 47.115744850**

**LONGITUDE: -88.503432237**

DATUM: MichGeoRef

**NORTHING:** 732339.009

EASTING: 309940.314

**SITE: AMW - Quincy Mining Company Portage**

COUNTY: Houghton

DATE: 9-11-18

TOWNSHIP: Osceola

DRILLER: Zack Nichols

TOWN: 55N

GEOLOGIST: Jeff Pincumbe

RANGE: 33W

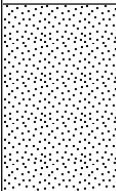
DRILL METHOD: Geoprobe

SECTION: 33

TOTAL DEPTH: 9 feet

LOCATION DESCRIPTION: Dollar Bay Well Field

ERNIE#: 31000098

| WELL<br>CONSTRUCTION | LITHOLOGIC<br>LOG                                                                 | DESCRIPTION                                           | DEPTH | SAMPLE ID | SAMPLE TYPE | FIELD<br>SCREENING<br>RESULTS                        | PID<br>ppm |
|----------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------|-------|-----------|-------------|------------------------------------------------------|------------|
|                      |                                                                                   |                                                       |       |           |             |                                                      | 0 1000     |
|                      |                                                                                   | Grd.                                                  | 0     |           |             | 0 ppm Soil samples collected from 0 - 6" and 6" - 5' |            |
|                      |  | SAND<br>Medium, brown                                 |       |           |             | 0 ppm                                                |            |
|                      |  | SANDS<br>Medium to coarse, brown, saturated at 5 feet | 5     |           |             | 0 ppm                                                |            |
|                      |                                                                                   | NO CUTTINGS                                           |       |           |             | 0 ppm                                                |            |
|                      |                                                                                   | E.O.B.                                                | 10    |           |             | Groundwater sample collected from 5' - 9'            |            |
|                      |                                                                                   |                                                       | 15    |           |             |                                                      |            |
|                      |                                                                                   |                                                       | 20    |           |             |                                                      |            |

VERTICAL DATUM: NA

GRD. ELEVATION: NA

T.O.C.: NA

S.W.L.: NA

CASING: NA

SCREEN: NA

WELL DEPTH: NA

COMPLETION NOTES: Backfilled with cuttings and bentonite

LATITUDE: 47.115415650

LONGITUDE: -88.502175843

DATUM: MichGeoRef

NORTHING: 732299.405

EASTING: 310034.424

**SITE: AMW - Quincy Mining Company Portage**

COUNTY: Houghton

DATE: 9-11-18

TOWNSHIP: Osceola

DRILLER: Zack Nichols

TOWN: 55N

GEOLOGIST: Jeff Pincumbe

RANGE: 33W

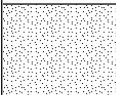
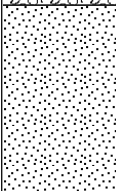
DRILL METHOD: Geoprobe

SECTION: 33

TOTAL DEPTH: 12 feet

LOCATION DESCRIPTION: Dollar Bay Well Field

ERNIE#: 31000098

| WELL<br>CONSTRUCTION | LITHOLOGIC<br>LOG                                                                  | DESCRIPTION                                 | DEPTH | SAMPLE ID | SAMPLE TYPE | FIELD<br>SCREENING<br>RESULTS                           | PID<br>ppm |
|----------------------|------------------------------------------------------------------------------------|---------------------------------------------|-------|-----------|-------------|---------------------------------------------------------|------------|
|                      |                                                                                    |                                             |       |           |             |                                                         | 0 1000     |
|                      |                                                                                    | Grd.                                        | 0     |           |             |                                                         |            |
|                      |   | SAND<br>Fine, gray                          |       |           |             | 0 ppm Soil samples collected<br>from 0 - 6" and 6" - 8' |            |
|                      |   | FILL<br>Gravel                              |       |           |             | 0 ppm                                                   |            |
|                      |                                                                                    |                                             |       |           |             | 0 ppm                                                   |            |
|                      |                                                                                    |                                             |       |           |             | 0 ppm                                                   |            |
|                      |  | SANDS<br>Medium, brown, saturated at 8 feet | 5     |           |             | 0 ppm                                                   |            |
|                      |                                                                                    |                                             |       |           |             | 0 ppm                                                   |            |
|                      |                                                                                    |                                             |       |           |             | 0 ppm                                                   |            |
|                      |                                                                                    |                                             |       |           |             | 0 ppm                                                   |            |
|                      |                                                                                    | NO CUTTINGS                                 | 10    |           |             | 0 ppm Groundwater sample<br>collected from 8' - 12'     |            |
|                      |                                                                                    |                                             |       |           |             |                                                         |            |
|                      |                                                                                    | E.O.B.                                      |       |           |             |                                                         |            |
|                      |                                                                                    |                                             | 15    |           |             |                                                         |            |
|                      |                                                                                    |                                             |       |           |             |                                                         |            |
|                      |                                                                                    |                                             | 20    |           |             |                                                         |            |

VERTICAL DATUM: NA

GRD. ELEVATION: NA

T.O.C.: NA

S.W.L.: NA

CASING: NA

SCREEN: NA

WELL DEPTH: NA

COMPLETION NOTES: Backfilled with cuttings and bentonite

LATITUDE: 47.115954300

LONGITUDE: -88.502036437

DATUM: MichGeoRef

NORTHING: 732358.904

EASTING: 310046.901

**SITE: AMW - Quincy Mining Company Portage**

COUNTY: Houghton

DATE: 9-10-18

TOWNSHIP: Osceola

DRILLER: Zack Nichols

TOWN: 55N

GEOLOGIST: Jeff Pincumbe

RANGE: 33W

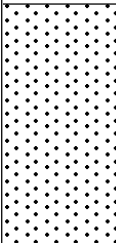
DRILL METHOD: Geoprobe

SECTION: 33

TOTAL DEPTH: 16 feet

LOCATION DESCRIPTION: Dollar Bay Well Field

ERNIE#: 31000098

| WELL<br>CONSTRUCTION | LITHOLOGIC<br>LOG                                                                 | DESCRIPTION                    | DEPTH | SAMPLE ID | SAMPLE TYPE | FIELD<br>SCREENING<br>RESULTS                              | PID<br>ppm |
|----------------------|-----------------------------------------------------------------------------------|--------------------------------|-------|-----------|-------------|------------------------------------------------------------|------------|
|                      |                                                                                   |                                |       |           |             |                                                            | 0 1000     |
|                      |                                                                                   | Grd.                           | 0     |           |             |                                                            |            |
|                      |  | SAND<br>Medium to coarse, gray |       |           |             | 0 ppm<br>Soil samples collected<br>from 0 - 6" and 6" - 5' |            |
|                      |                                                                                   | No Recovery                    | 5     |           |             | 0 ppm<br>0 ppm<br>0 ppm<br>0 ppm<br>0 ppm                  |            |
|                      |                                                                                   | NO CUTTINGS                    | 10    |           |             | 0 ppm                                                      |            |
|                      |                                                                                   |                                | 15    |           |             | Groundwater sample<br>collected from 12' -<br>16'          |            |
|                      |                                                                                   | E.O.B.                         | 20    |           |             |                                                            |            |

VERTICAL DATUM: NA

GRD. ELEVATION: NA

T.O.C.: NA

S.W.L.: NA

CASING: NA

SCREEN: NA

WELL DEPTH: NA

COMPLETION NOTES: Backfilled with cuttings and bentonite

LATITUDE: 47.115884730

LONGITUDE: -88.501205742

DATUM: MichGeoRef

NORTHING: 732349.169

EASTING: 310109.648

**SITE: AMW - Quincy Mining Company Portage**

COUNTY: Houghton

DATE: 9-10-18

TOWNSHIP: Osceola

DRILLER: Zack Nichols

TOWN: 55N

GEOLOGIST: Jeff Pincumbe

RANGE: 33W

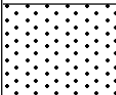
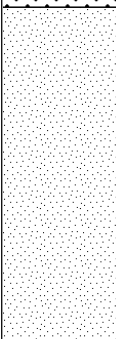
DRILL METHOD: Geoprobe

SECTION: 33

TOTAL DEPTH: 13 feet

LOCATION DESCRIPTION: Dollar Bay Well Field

ERNIE#: 31000098

| WELL<br>CONSTRUCTION | LITHOLOGIC<br>LOG                                                                  | DESCRIPTION                                        | DEPTH  | SAMPLE ID | SAMPLE TYPE | FIELD<br>SCREENING<br>RESULTS | PID<br>ppm |
|----------------------|------------------------------------------------------------------------------------|----------------------------------------------------|--------|-----------|-------------|-------------------------------|------------|
|                      |                                                                                    |                                                    | Grd.   |           |             |                               | 0 1000     |
|                      |   | SAND<br>Medium to coarse, gray                     | 0      |           |             | 0 ppm                         |            |
|                      |  | SAND<br>Fine to medium, brown, saturated at 9 feet | 5      |           |             | 0 ppm                         |            |
|                      |                                                                                    | NO CUTTINGS                                        | 10     |           |             | 0 ppm                         |            |
|                      |                                                                                    |                                                    | 15     |           |             | 0 ppm                         |            |
|                      |                                                                                    |                                                    | E.O.B. |           |             | 0 ppm                         |            |
|                      |                                                                                    |                                                    | 20     |           |             | 0 ppm                         |            |

VERTICAL DATUM: NA

GRD. ELEVATION: NA

T.O.C.: NA

S.W.L.: NA

CASING: NA

SCREEN: NA

WELL DEPTH: NA

COMPLETION NOTES: Backfilled with cuttings and bentonite

LATITUDE: 47.116689300

LONGITUDE: -88.501008787

DATUM: MichGeoRef

NORTHING: 732438.070

EASTING: 310127.428



**SITE: AMW - Quincy Mining Company Portage**

COUNTY: Houghton

DATE: 9-10-18

TOWNSHIP: Osceola

DRILLER: Zack Nichols

TOWN: 55N

GEOLOGIST: Jeff Pincumbe

RANGE: 33W

DRILL METHOD: Geoprobe

SECTION: 33

TOTAL DEPTH: 16 feet

LOCATION DESCRIPTION: Dollar Bay Well Field

ERNIE#: 31000098

| WELL<br>CONSTRUCTION | LITHOLOGIC<br>LOG | DESCRIPTION                                           | DEPTH | SAMPLE ID | SAMPLE TYPE | FIELD<br>SCREENING<br>RESULTS | PID<br>ppm |
|----------------------|-------------------|-------------------------------------------------------|-------|-----------|-------------|-------------------------------|------------|
|                      |                   |                                                       |       |           |             |                               | 0 1000     |
|                      |                   | Grd.                                                  | 0     |           |             | 0 ppm                         |            |
|                      |                   | SAND<br>Medium to coarse, gray                        |       |           |             | 0 ppm                         |            |
|                      |                   | SAND<br>Medium to coarse, brown, saturated at 12 feet |       |           |             | 0 ppm                         |            |
|                      |                   |                                                       | 5     |           |             | 0 ppm                         |            |
|                      |                   |                                                       |       |           |             | 0 ppm                         |            |
|                      |                   |                                                       | 10    |           |             | 0 ppm                         |            |
|                      |                   |                                                       |       |           |             | 0 ppm                         |            |
|                      |                   | NO CUTTINGS                                           | 15    |           |             | 0 ppm                         |            |
|                      |                   | E.O.B.                                                |       |           |             | 0 ppm                         |            |
|                      |                   |                                                       | 20    |           |             |                               |            |

VERTICAL DATUM: NA

GRD. ELEVATION: NA

T.O.C.: NA

S.W.L.: NA

CASING: NA

SCREEN: NA

WELL DEPTH: NA

COMPLETION NOTES: Backfilled with cuttings and bentonite

LATITUDE: 47.117438650

LONGITUDE: -88.501473587

DATUM: MichGeoRef

NORTHING: 732522.433

EASTING: 310094.833



**SITE: AMW - Quincy Mining Company Portage**

**BORING/WELL: SB/GW-61**

**COUNTY:** Houghton

**DATE:** 9-7-18

**TOWNSHIP:** Franklin

**DRILLER:** Zack Nichols

**TOWN: 55N**

**GEOLOGIST:** Jeff Pincumbe

**RANGE: 34W**

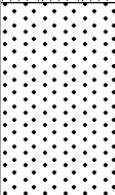
**DRILL METHOD:** Geoprobe

**SECTION: 36**

**TOTAL DEPTH: 9 feet**

**LOCATION DESCRIPTION:** Julio's Salvage Yard

ERNIE#: 31000098

| WELL<br>CONSTRUCTION | LITHOLOGIC<br>LOG                                                                 | DESCRIPTION                                          | DEPTH | SAMPLE ID | SAMPLE TYPE | FIELD<br>SCREENING<br>RESULTS                | PID<br>ppm |
|----------------------|-----------------------------------------------------------------------------------|------------------------------------------------------|-------|-----------|-------------|----------------------------------------------|------------|
|                      |                                                                                   | Grd.                                                 | 0     |           |             |                                              | 0          |
|                      |  | SAND<br>Fine to medium, brown                        |       |           |             | 0 ppm                                        |            |
|                      |  | SAND<br>Medium to coarse, brown, saturated at 4 feet |       |           |             | 0 ppm                                        |            |
|                      |                                                                                   | NO CUTTINGS                                          | 5     |           |             | 0 ppm                                        |            |
|                      |                                                                                   | E.O.B.                                               | 10    |           |             | Groundwater sample<br>collected from 5' - 9' |            |
|                      |                                                                                   |                                                      | 15    |           |             |                                              |            |
|                      |                                                                                   |                                                      | 20    |           |             |                                              |            |

VERTICAL DATUM: NA

**GRD. ELEVATION: NA**

**T.O.C.: NA**

**S.W.L.: NA**

**CASING: NA**

**SCREEN: NA**

WELL DEPTH: NA

**COMPLETION NOTES:** Backfilled with cuttings and bentonite

**LATITUDE: 47.126211330**

**LONGITUDE: -88.556068830**

DATUM: MichGeoRef

**NORTHING:** 733630.222

EASTING: 305986.677



## BOREHOLE LOG

**BORING/WELL: SB/GW-62**

**SITE: AMW - Quincy Mining Company Portage**

**COUNTY:** Houghton

**DATE:** 9-7-18

**TOWNSHIP:** Franklin

**DRILLER:** Zack Nichols

**TOWN: 55N**

**GEOLOGIST:** Jeff Pincumbe

**RANGE: 34W**

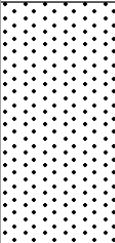
**DRILL METHOD:** Geoprobe

**SECTION: 36**

**TOTAL DEPTH: 8 feet**

**LOCATION DESCRIPTION:** Julio's Salvage Yard

**ERNIE#:** 31000098

| WELL<br>CONSTRUCTION | LITHOLOGIC<br>LOG                                                                 | DESCRIPTION                                          | DEPTH | SAMPLE ID | SAMPLE TYPE | FIELD<br>SCREENING<br>RESULTS                                                                                                                                  | PID |      |
|----------------------|-----------------------------------------------------------------------------------|------------------------------------------------------|-------|-----------|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
|                      |                                                                                   |                                                      |       |           |             |                                                                                                                                                                | 0   | 1000 |
|                      |                                                                                   | Grd.                                                 | 0     |           |             | 0 ppm<br>Soil samples collected<br>from 0 - 6" and 6" - 4'<br><br>0 ppm<br><br>0 ppm<br><br>0 ppm<br><br>0 ppm<br>Groundwater sample<br>collected from 4' - 8' |     |      |
|                      |  | SAND<br>Medium to coarse, brown, saturated at 4 feet |       |           |             |                                                                                                                                                                |     |      |
|                      |                                                                                   | NO CUTTINGS                                          | 5     |           |             |                                                                                                                                                                |     |      |
|                      |                                                                                   | E.O.B.                                               |       |           |             |                                                                                                                                                                |     |      |
|                      |                                                                                   |                                                      | 10    |           |             |                                                                                                                                                                |     |      |
|                      |                                                                                   |                                                      | 15    |           |             |                                                                                                                                                                |     |      |
|                      |                                                                                   |                                                      | 20    |           |             |                                                                                                                                                                |     |      |

VERTICAL DATUM: NA

**GRD. ELEVATION: NA**

**T.O.C.: NA**

S.W.L.: NA

**CASING: NA**

**SCREEN: NA**

WELL DEPTH: NA

**COMPLETION NOTES:** Backfilled with cuttings and bentonite

LATITUDE: 47.126140361

**LONGITUDE: -88.554747239**

DATUM: MichGeoRef

**NORTHING:** 733619.078

EASTING: 306086.617



**SITE: AMW - Quincy Mining Company Portage**

**BORING/WELL: SB/GW-63**

**COUNTY:** Houghton

**DATE:** 9-7-18

**TOWNSHIP:** Franklin

**DRILLER:** Zack Nichols

**TOWN: 55N**

**GEOLOGIST:** Jeff Pincumbe

**RANGE: 34W**

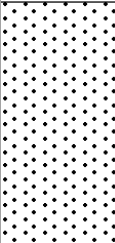
**DRILL METHOD:** Geoprobe

**SECTION: 36**

**TOTAL DEPTH: 8 feet**

**LOCATION DESCRIPTION:** Julio's Salvage Yard

ERNIE#: 31000098

| WELL<br>CONSTRUCTION | LITHOLOGIC<br>LOG                                                                 | DESCRIPTION                                          | DEPTH | SAMPLE ID | SAMPLE TYPE | FIELD<br>SCREENING<br>RESULTS | PID                                               |                                              |
|----------------------|-----------------------------------------------------------------------------------|------------------------------------------------------|-------|-----------|-------------|-------------------------------|---------------------------------------------------|----------------------------------------------|
|                      |                                                                                   |                                                      |       |           |             |                               | 0                                                 | 1000                                         |
|                      |                                                                                   | Grd.                                                 | 0     |           |             | 0 ppm                         | Soil samples collected<br>from 0 - 6' and 6" - 4' |                                              |
|                      |  | SAND<br>Medium to coarse, brown, saturated at 4 feet |       |           |             | 0 ppm                         |                                                   |                                              |
|                      |                                                                                   | NO CUTTINGS                                          | 5     |           |             | 0 ppm                         |                                                   | Groundwater sample<br>collected from 4' - 8' |
|                      |                                                                                   | E.O.B.                                               |       |           |             |                               |                                                   |                                              |
|                      |                                                                                   |                                                      | 10    |           |             |                               |                                                   |                                              |
|                      |                                                                                   |                                                      | 15    |           |             |                               |                                                   |                                              |
|                      |                                                                                   |                                                      | 20    |           |             |                               |                                                   |                                              |

VERTICAL DATUM: NA

**GRD. ELEVATION: NA**

**T.O.C.: NA**

S.W.L.: NA

**CASING: NA**

**SCREEN: NA**

WELL DEPTH: NA

**COMPLETION NOTES:** Backfilled with cuttings and bentonite

LATITUDE: 47.126114699

**LONGITUDE: -88.554601059**

DATUM: MichGeoRef

**NORTHING:** 733615.867

EASTING: 306097.607



**SITE: AMW - Quincy Mining Company Portage**

**BORING/WELL:** SB/GW-64

**COUNTY:** Houghton

**DATE:** 9-7-18

**TOWNSHIP:** Franklin

**DRILLER:** Zack Nichols

**TOWN: 55N**

**GEOLOGIST:** Jeff Pincumbe

**RANGE: 34W**

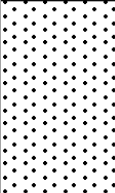
**DRILL METHOD:** Geoprobe

**SECTION: 36**

**TOTAL DEPTH: 9 feet**

**LOCATION DESCRIPTION:** Julio's Salvage Yard

**ERNIE#:** 31000098

| WELL<br>CONSTRUCTION | LITHOLOGIC<br>LOG                                                                 | DESCRIPTION                                          | DEPTH | SAMPLE ID | SAMPLE TYPE | FIELD<br>SCREENING<br>RESULTS                                                                                                                                      | PID |      |
|----------------------|-----------------------------------------------------------------------------------|------------------------------------------------------|-------|-----------|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
|                      |                                                                                   |                                                      |       |           |             |                                                                                                                                                                    | 0   | 1000 |
|                      |                                                                                   | Grd.                                                 | 0     |           |             | 0 ppm    Soil samples collected<br>from 0 - 6" and 6" - 4'<br><br>0 ppm<br><br>0 ppm<br><br>0 ppm<br><br>0 ppm<br><br>Groundwater sample<br>collected from 5' - 9' |     |      |
|                      |  | SAND<br>Fine to medium, brown                        |       |           |             |                                                                                                                                                                    |     |      |
|                      |  | SAND<br>Medium to coarse, brown, saturated at 5 feet |       |           |             |                                                                                                                                                                    |     |      |
|                      |                                                                                   | NO CUTTINGS                                          | 5     |           |             |                                                                                                                                                                    |     |      |
|                      |                                                                                   |                                                      |       |           |             |                                                                                                                                                                    |     |      |
|                      |                                                                                   | E.O.B.                                               | 10    |           |             |                                                                                                                                                                    |     |      |
|                      |                                                                                   |                                                      | 15    |           |             |                                                                                                                                                                    |     |      |
|                      |                                                                                   |                                                      | 20    |           |             |                                                                                                                                                                    |     |      |

VERTICAL DATUM: NA

**GRD. ELEVATION: NA**

**T.O.C.: NA**

**S.W.L.: NA**

**CASING: NA**

**SCREEN: NA**

WELL DEPTH: NA

**COMPLETION NOTES:** Backfilled with cuttings and bentonite

**LATITUDE: 47.125882954**

**LONGITUDE: -88.554674869**

DATUM: MichGeoRef

**NORTHING:** 733590.306

EASTING: 306091.174

# SITE: AMW - Quincy Mining Company Portage

COUNTY: Houghton

DATE: 9-11-18

TOWNSHIP: Osceola

DRILLER: Zack Nichols

TOWN: 55N

GEOLOGIST: Jeff Pincumbe

RANGE: 34W

DRILL METHOD: Geoprobe

SECTION: 36

TOTAL DEPTH: 7 feet

LOCATION DESCRIPTION: Road Commision Area

ERNIE#: 31000098

| WELL<br>CONSTRUCTION | LITHOLOGIC<br>LOG | DESCRIPTION                                        | DEPTH | SAMPLE ID | SAMPLE TYPE | FIELD<br>SCREENING<br>RESULTS                | PID<br>ppm<br>0 1000 |
|----------------------|-------------------|----------------------------------------------------|-------|-----------|-------------|----------------------------------------------|----------------------|
|                      |                   | Grd.                                               | 0     |           |             | Soil sample collected<br>from 0 - 3'         |                      |
|                      |                   | SAND<br>Fine to medium, brown, saturated at 3 feet |       |           |             |                                              |                      |
|                      |                   |                                                    |       |           |             |                                              |                      |
|                      |                   |                                                    |       |           |             |                                              |                      |
|                      |                   | NO CUTTINGS                                        | 5     |           |             | Groundwater sample<br>collected from 3' - 7' |                      |
|                      |                   |                                                    |       |           |             |                                              |                      |
|                      |                   | E.O.B.                                             |       |           |             |                                              |                      |
|                      |                   |                                                    | 10    |           |             |                                              |                      |
|                      |                   |                                                    |       |           |             |                                              |                      |
|                      |                   |                                                    |       |           |             |                                              |                      |
|                      |                   |                                                    | 15    |           |             |                                              |                      |
|                      |                   |                                                    |       |           |             |                                              |                      |
|                      |                   |                                                    |       |           |             |                                              |                      |
|                      |                   |                                                    | 20    |           |             |                                              |                      |

VERTICAL DATUM: NA

GRD. ELEVATION: NA

T.O.C.: NA

S.W.L.: NA

CASING: NA

SCREEN: NA

WELL DEPTH: NA

COMPLETION NOTES: Backfilled with cuttings and bentonite

LATITUDE: 47.125768550

LONGITUDE: -88.568762900

DATUM: MichGeoRef

NORTHING: 733612.441

EASTING: 305022.663



# **SITE: AMW - Quincy Mining Company Portage**

**COUNTY:** Houghton

**DATE:** 9-11-18

**TOWNSHIP:** Osceola

**DRILLER:** Zack Nichols

**TOWN:** 55N

**GEOLOGIST:** Jeff Pincumbe

**RANGE:** 34W

**DRILL METHOD:** Geoprobe

**SECTION:** 36

**TOTAL DEPTH:** 7 feet

**LOCATION DESCRIPTION:** Road Commision Area

**ERNIE#:** 31000098

| WELL<br>CONSTRUCTION | LITHOLOGIC<br>LOG | DESCRIPTION                                        | DEPTH | SAMPLE ID | SAMPLE TYPE | FIELD<br>SCREENING<br>RESULTS                | PID<br>ppm<br>0 1000 |
|----------------------|-------------------|----------------------------------------------------|-------|-----------|-------------|----------------------------------------------|----------------------|
|                      |                   | Grd.                                               | 0     |           |             | Soil sample collected<br>from 0 - 3'         |                      |
|                      |                   | SAND<br>Fine to medium, brown, saturated at 3 feet |       |           |             |                                              |                      |
|                      |                   |                                                    |       |           |             |                                              |                      |
|                      |                   |                                                    |       |           |             |                                              |                      |
|                      |                   |                                                    |       |           |             |                                              |                      |
|                      |                   | NO CUTTINGS                                        | 5     |           |             | Groundwater sample<br>collected from 3' - 7' |                      |
|                      |                   |                                                    |       |           |             |                                              |                      |
|                      |                   | E.O.B.                                             |       |           |             |                                              |                      |
|                      |                   |                                                    | 10    |           |             |                                              |                      |
|                      |                   |                                                    |       |           |             |                                              |                      |
|                      |                   |                                                    |       |           |             |                                              |                      |
|                      |                   |                                                    |       |           |             |                                              |                      |
|                      |                   |                                                    | 15    |           |             |                                              |                      |
|                      |                   |                                                    |       |           |             |                                              |                      |
|                      |                   |                                                    |       |           |             |                                              |                      |
|                      |                   |                                                    |       |           |             |                                              |                      |
|                      |                   |                                                    | 20    |           |             |                                              |                      |

**VERTICAL DATUM:** NA

**GRD. ELEVATION:** NA

**T.O.C.:** NA

**S.W.L.:** NA

**CASING:** NA

**SCREEN:** NA

**WELL DEPTH:** NA

**COMPLETION NOTES:** Backfilled with cuttings and bentonite

**LATITUDE:** 47.125738480

**LONGITUDE:** -88.567934070

**DATUM:** MichGeoRef

**NORTHING:** 733607.046

**EASTING:** 305085.392

## APPENDIX F

### SEDIMENT CORE LOGS





Remediation and  
Redevelopment  
Division

## BOREHOLE LOG

BORING/WELL: QMCP-SD01

# SITE: Abandoned Mining Wastes Torch Lake

COUNTY: Houghton

DATE: 9/5/2018

TOWNSHIP: Franklin

DRILLER: B. Lower

TOWN: 55N

GEOLOGIST: B. Eustice

RANGE: 34W

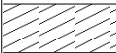
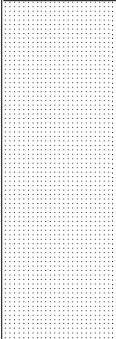
DRILL METHOD: Vibecore

SECTION: 35

TOTAL DEPTH: 3.08' in 13' of water

LOCATION DESCRIPTION: Quincy Mining Company Portage

ERNIE ID# 31000098

| WELL<br>CONSTRUCTION | LITHOLOGIC<br>LOG                                                                  | DESCRIPTION                                           | DEPTH | SAMPLE TYPE                                                                         | SAMPLE ID       | NOTES | Water Quality<br>Meter |
|----------------------|------------------------------------------------------------------------------------|-------------------------------------------------------|-------|-------------------------------------------------------------------------------------|-----------------|-------|------------------------|
|                      |                                                                                    | Lake Bottom                                           | 0     |                                                                                     |                 |       |                        |
|                      |   | <b>FINES</b><br>Dark brown, loose, very soft.         |       |    | QMCP-SD01-0-6"  |       |                        |
|                      |  | <b>SAND</b><br>Brown, fine grain, well sorted.        |       |    | QMCP-SD01-6-26" |       |                        |
|                      |                                                                                    | <b>SAND</b><br>Brown, fine grain, well sorted, roots. |       |  |                 |       |                        |
|                      |                                                                                    | <b>No recovery</b>                                    |       |                                                                                     |                 |       |                        |
|                      |                                                                                    | E.O.B.                                                | 5     |                                                                                     |                 |       |                        |

VERTICAL DATUM:

GRD. ELEVATION:

T.O.C.:

S.W.L.:

CASING:

SCREEN:

WELL DEPTH:

COMPLETION NOTES:

LATITUDE: 47.125618673

LONGITUDE: -88.569352200

PROJECTION: MiGeoRef

NORTHING: 733597.254

EASTING: 304977.440



Remediation and  
Redevelopment  
Division

## BOREHOLE LOG

BORING/WELL: QMCP-SD02

# SITE: Abandoned Mining Wastes Torch Lake

COUNTY: Houghton

DATE: 9/5/2018

TOWNSHIP: Franklin

DRILLER: B. Lower

TOWN: 55N

GEOLOGIST: B. Eustice

RANGE: 34W

DRILL METHOD: Vibecore

SECTION: 35

TOTAL DEPTH: 4.83' in 8.6' of water

LOCATION DESCRIPTION: Quincy Mining Company Portage

ERNIE ID# 31000098

| WELL<br>CONSTRUCTION | LITHOLOGIC<br>LOG | DESCRIPTION                                                                                                | DEPTH | SAMPLE TYPE | SAMPLE ID              | NOTES | Water Quality<br>Meter |
|----------------------|-------------------|------------------------------------------------------------------------------------------------------------|-------|-------------|------------------------|-------|------------------------|
|                      |                   | Lake Bottom                                                                                                | 0     |             |                        |       |                        |
|                      |                   | <b>SAND with GRAVEL</b><br>Dark brown - black, coarse grain, some organics<br>(wood and roots), oily odor. |       |             | QMCP-SD02-0-12" and FD |       |                        |
|                      |                   | <b>FINES</b><br>Soft, few sands and gravel, wet.                                                           |       |             | QMCP-SD02-12-21.5"     |       |                        |
|                      |                   | <b>No recovery</b>                                                                                         |       |             |                        |       |                        |
|                      |                   | E.O.B.                                                                                                     | -5    |             |                        |       |                        |

VERTICAL DATUM:

GRD. ELEVATION:

T.O.C.:

S.W.L.:

CASING:

SCREEN:

WELL DEPTH:

COMPLETION NOTES:

LATITUDE: 47.125426123

LONGITUDE: -88.566724731

PROJECTION: MiGeoRef

NORTHING: 733569.350

EASTING: 305175.945



Remediation and  
Redevelopment  
Division

## BOREHOLE LOG

BORING/WELL: QMCP-SD03

# SITE: Abandoned Mining Wastes Torch Lake

COUNTY: Houghton

DATE: 9/5/2018

TOWNSHIP: Franklin

DRILLER: B. Lower

TOWN: 55N

GEOLOGIST: B. Eustice

RANGE: 34W

DRILL METHOD: Vibecore

SECTION: 35

TOTAL DEPTH: 1.75' in 27' of water

LOCATION DESCRIPTION: Quincy Mining Company Portage

ERNIE ID# 31000098

| WELL<br>CONSTRUCTION | LITHOLOGIC<br>LOG | DESCRIPTION                                                                 | DEPTH | SAMPLE TYPE | SAMPLE ID      | NOTES | Water Quality<br>Meter |
|----------------------|-------------------|-----------------------------------------------------------------------------|-------|-------------|----------------|-------|------------------------|
|                      |                   | Lake Bottom                                                                 | 0     |             |                |       |                        |
|                      |                   | <b>GRAVELLY SAND</b><br>Brownish purple, coarse grain sand, angular gravel. |       |             | QMCP-SD03-0-6" |       |                        |
|                      |                   | <b>No recovery</b>                                                          |       |             |                |       |                        |
|                      |                   | E.O.B.                                                                      | 5     |             |                |       |                        |

VERTICAL DATUM:

GRD. ELEVATION:

T.O.C.:

S.W.L.:

CASING:

SCREEN:

WELL DEPTH:

COMPLETION NOTES:

LATITUDE: 47.124415866

LONGITUDE: -88.559088707

PROJECTION: MiGeoRef

NORTHING: 733438.232

EASTING: 305751.224



Remediation and  
Redevelopment  
Division

## BOREHOLE LOG

BORING/WELL: QMCP-SD04

# SITE: Abandoned Mining Wastes Torch Lake

COUNTY: Houghton

DATE: 9/5/2018

TOWNSHIP: Franklin

DRILLER: B. Lower

TOWN: 55N

GEOLOGIST: B. Eustice

RANGE: 34W

DRILL METHOD: Vibecore

SECTION: 35

TOTAL DEPTH: Unknown in 30.4' of water

LOCATION DESCRIPTION: Quincy Mining Company Portage

ERNIE ID# 31000098

| WELL<br>CONSTRUCTION | LITHOLOGIC<br>LOG                                                                 | DESCRIPTION                                                 | DEPTH | SAMPLE TYPE                                                                       | SAMPLE ID        | NOTES | Water Quality<br>Meter |
|----------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------|-------|-----------------------------------------------------------------------------------|------------------|-------|------------------------|
|                      |                                                                                   | Lake Bottom                                                 | 0     |                                                                                   |                  |       |                        |
|                      |  | <b>FINES</b><br>Brown, trace gravel, very soft, oily sheen. |       |  | QMCP-SD04-0-4.5" |       |                        |
|                      |  | <b>SAND and FINES</b><br>Brown, coarse grain, soft, loose.  |       |  | QMCP-SD04-4.5-9" |       |                        |
|                      |                                                                                   | E.O.B.                                                      | 5     |                                                                                   |                  |       |                        |

VERTICAL DATUM:

GRD. ELEVATION:

T.O.C.:

S.W.L.:

CASING:

SCREEN:

WELL DEPTH:

COMPLETION NOTES:

LATITUDE: 47.124871920

LONGITUDE: -88.558277785

PROJECTION: MiGeoRef

NORTHING: 733486.889

EASTING: 305814.357





Remediation and  
Redevelopment  
Division

## BOREHOLE LOG

BORING/WELL: QMCP-SD05

# SITE: Abandoned Mining Wastes Torch Lake

COUNTY: Houghton

DATE: 9/5/2018

TOWNSHIP: Franklin

DRILLER: B. Lower

TOWN: 55N

GEOLOGIST: B. Eustice

RANGE: 34W

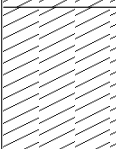
DRILL METHOD: Vibecore

SECTION: 35

TOTAL DEPTH: 1.75' in 15.6' of water

LOCATION DESCRIPTION: Quincy Mining Company Portage

ERNIE ID# 31000098

| WELL<br>CONSTRUCTION | LITHOLOGIC<br>LOG                                                                  | DESCRIPTION                                                           | DEPTH | SAMPLE TYPE                                                                        | SAMPLE ID       | NOTES | Water Quality<br>Meter |
|----------------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------|-------|------------------------------------------------------------------------------------|-----------------|-------|------------------------|
|                      |                                                                                    | Lake Bottom                                                           | 0     |                                                                                    |                 |       |                        |
|                      |   | <b>FINES</b><br>Brown, soft, loose.                                   |       |   | QMCP-SD05-0-6"  |       |                        |
|                      |   | <b>CLAY</b><br>Brown, trace to some gravel, firm, strong sulfur odor. |       |   | QMCP-SD05-6-18" |       |                        |
|                      |  | <b>CLAY</b><br>Clay with wood debris.                                 |       |  |                 |       |                        |
|                      |                                                                                    | <b>No recovery</b>                                                    |       |                                                                                    |                 |       |                        |
|                      |                                                                                    | E.O.B.                                                                | 5     |                                                                                    |                 |       |                        |

VERTICAL DATUM:

GRD. ELEVATION:

T.O.C.:

S.W.L.:

CASING:

SCREEN:

WELL DEPTH:

COMPLETION NOTES:

LATITUDE: 47.125551931

LONGITUDE: -88.558017244

PROJECTION: MiGeoRef

NORTHING: 733561.784

EASTING: 305836.571



Remediation and  
Redevelopment  
Division

## BOREHOLE LOG

BORING/WELL: QMCP-SD06

# SITE: Abandoned Mining Wastes Torch Lake

COUNTY: Houghton

DATE: 9/5/2018

TOWNSHIP: Franklin

DRILLER: B. Lower

TOWN: 55N

GEOLOGIST: B. Eustice

RANGE: 34W

DRILL METHOD: Vibecore

SECTION: 35

TOTAL DEPTH: 5.5' in 0.8' of water

LOCATION DESCRIPTION: Quincy Mining Company Portage

ERNIE ID# 31000098

| WELL<br>CONSTRUCTION | LITHOLOGIC<br>LOG | DESCRIPTION                                                                                  | DEPTH | SAMPLE TYPE | SAMPLE ID              | NOTES | Water Quality<br>Meter |
|----------------------|-------------------|----------------------------------------------------------------------------------------------|-------|-------------|------------------------|-------|------------------------|
|                      |                   | Lake Bottom                                                                                  | 0     |             |                        |       |                        |
|                      |                   | <b>SAND and GRAVEL</b><br>Coarse grain (stamp sands).                                        |       |             |                        |       |                        |
|                      |                   | <b>SILTY SAND</b><br>Brown, fine to coarse grain, firm.                                      |       |             | QMCP-SD06-0-15" and FD |       |                        |
|                      |                   | <b>SAND</b><br>Dark brown, coarse grain (stamp sands), trace organics, some fines 1.7-1.9ft. |       |             | QMCP-SD06-15-35"       |       |                        |
|                      |                   | No recovery                                                                                  |       |             |                        |       |                        |
|                      |                   |                                                                                              | 5     |             |                        |       |                        |
|                      |                   | E.O.B.                                                                                       |       |             |                        |       |                        |

VERTICAL DATUM:

GRD. ELEVATION:

T.O.C.:

S.W.L.:

CASING:

SCREEN:

WELL DEPTH:

COMPLETION NOTES:

LATITUDE: 47.125047005

LONGITUDE: -88.556227842

PROJECTION: MiGeoRef

NORTHING: 733501.277

EASTING: 305970.411



Remediation and  
Redevelopment  
Division

## BOREHOLE LOG

BORING/WELL: QMCP-SD07

# SITE: Abandoned Mining Wastes Torch Lake

COUNTY: Houghton

DATE: 9/5/2018

TOWNSHIP: Franklin

DRILLER: B. Lower

TOWN: 55N

GEOLOGIST: B. Eustice

RANGE: 33W

DRILL METHOD: Vibecore

SECTION: 31

TOTAL DEPTH: 1.67' in 3.7' of water

LOCATION DESCRIPTION: Quincy Mining Company Portage

ERNIE ID# 31000098

| WELL<br>CONSTRUCTION | LITHOLOGIC<br>LOG | DESCRIPTION                                                               | DEPTH | SAMPLE TYPE | SAMPLE ID       | NOTES | Water Quality<br>Meter |
|----------------------|-------------------|---------------------------------------------------------------------------|-------|-------------|-----------------|-------|------------------------|
|                      |                   | Lake Bottom                                                               | 0     |             |                 |       |                        |
|                      |                   | <b>SAND with GRAVEL</b><br>Dark brown - purple, coarse grain, some fines. |       |             | QMCP-SD07-0-11" |       |                        |
|                      |                   | No recovery                                                               |       |             |                 |       |                        |
|                      |                   | E.O.B.                                                                    | 5     |             |                 |       |                        |

VERTICAL DATUM:

GRD. ELEVATION:

T.O.C.:

S.W.L.:

CASING:

SCREEN:

WELL DEPTH:

COMPLETION NOTES:

LATITUDE: 47.125035156

LONGITUDE: -88.552177816

PROJECTION: MiGeoRef

NORTHING: 733489.973

EASTING: 306277.430



Remediation and  
Redevelopment  
Division

## BOREHOLE LOG

BORING/WELL: QMCP-SD08

# SITE: Abandoned Mining Wastes Torch Lake

COUNTY: Houghton

DATE: 9/5/2018

TOWNSHIP: Franklin

DRILLER: B. Lower

TOWN: 55N

GEOLOGIST: B. Eustice

RANGE: 33W

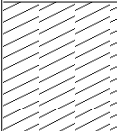
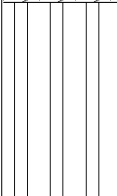
DRILL METHOD: Vibecore

SECTION: 31

TOTAL DEPTH: 2.92' in 5.8' of water

LOCATION DESCRIPTION: Quincy Mining Company Portage

ERNIE ID# 31000098

| WELL<br>CONSTRUCTION | LITHOLOGIC<br>LOG                                                                  | DESCRIPTION                                             | DEPTH | SAMPLE TYPE                                                                        | SAMPLE ID       | NOTES | Water Quality<br>Meter |
|----------------------|------------------------------------------------------------------------------------|---------------------------------------------------------|-------|------------------------------------------------------------------------------------|-----------------|-------|------------------------|
|                      |                                                                                    | Lake Bottom                                             | 0     |                                                                                    |                 |       |                        |
|                      |   | <b>FINES</b><br>Dark brown, organics/wood debris, soft. |       |  | QMCP-SD08-0-8"  |       |                        |
|                      |  | <b>SILT</b><br>Gray - brown, well sorted, firm, wet.    |       |                                                                                    | QMCP-SD08-8-20" |       |                        |
|                      |                                                                                    | <b>No recovery</b>                                      |       |                                                                                    |                 |       |                        |
|                      |                                                                                    | E.O.B.                                                  | -5    |                                                                                    |                 |       |                        |

VERTICAL DATUM:

GRD. ELEVATION:

T.O.C.:

S.W.L.:

CASING:

SCREEN:

WELL DEPTH:

COMPLETION NOTES:

LATITUDE: 47.123401471

LONGITUDE: -88.546232929

PROJECTION: MiGeoRef

NORTHING: 733293.866

EASTING: 306722.271



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## BOREHOLE LOG

BORING/WELL: QMCP-SD09

# SITE: Abandoned Mining Wastes Torch Lake

COUNTY: Houghton

DATE: 9/6/2018

TOWNSHIP: Osceola

DRILLER: B. Lower

TOWN: 55N

GEOLOGIST: B. Eustice

RANGE: 33W

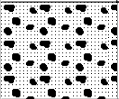
DRILL METHOD: Vibecore

SECTION: 33

TOTAL DEPTH: Unknown in 21.4' of water

LOCATION DESCRIPTION: Quincy Mining Company Portage

ERNIE ID# 31000098

| WELL<br>CONSTRUCTION | LITHOLOGIC<br>LOG                                                                 | DESCRIPTION                                                   | DEPTH | SAMPLE TYPE                                                                       | SAMPLE ID      | NOTES | Water Quality<br>Meter |
|----------------------|-----------------------------------------------------------------------------------|---------------------------------------------------------------|-------|-----------------------------------------------------------------------------------|----------------|-------|------------------------|
|                      |                                                                                   | Lake Bottom                                                   | 0     |                                                                                   |                |       |                        |
|                      |  | <b>SANDY GRAVEL</b><br>Dark brown, few fines and wood debris. |       |  | QMCP-SD09-0-6" |       |                        |
|                      |                                                                                   | E.O.B.                                                        |       |                                                                                   |                |       |                        |
|                      |                                                                                   |                                                               | 5     |                                                                                   |                |       |                        |

VERTICAL DATUM:

GRD. ELEVATION:

T.O.C.:

S.W.L.:

CASING:

SCREEN:

WELL DEPTH:

COMPLETION NOTES:

LATITUDE: 47.115207764

LONGITUDE: -88.503007450

PROJECTION: MiGeoRef

NORTHING: 732278.321

EASTING: 309970.626



**SITE: Abandoned Mining Wastes Torch Lake**

**BORING/WELL:** QMCP-SD10

**COUNTY:** Houghton

**DATE:** 9/6/2018

**TOWNSHIP:** Osceola

**DRILLER:** B. Lower

**TOWN:** 55N

**GEOLOGIST:** B. Eustice

**RANGE: 33W**

**DRILL METHOD:** Vibecore

**SECTION: 33**

**TOTAL DEPTH: 6' in 11.1' of water**

**LOCATION DESCRIPTION:** Quincy Mining Company Portage

**ERNIE ID# 31000098**

|                   |                        |
|-------------------|------------------------|
| VERTICAL DATUM:   | LATITUDE: 47.113501    |
| GRD. ELEVATION:   | LONGITUDE: -88.4998740 |
| T.O.C.:           | PROJECTION: MiGeoRef   |
| S.W.L.:           | NORTHING: 732081.158   |
| CASING:           | EASTING: 310202.208    |
| SCREEN:           |                        |
| WELL DEPTH:       |                        |
| COMPLETION NOTES: |                        |





**SITE: Abandoned Mining Wastes Torch Lake**

**BORING/WELL:** QMCP-SD11

**COUNTY:** Houghton

**DATE:** 9/6/2018

**TOWNSHIP:** Osceola

**DRILLER:** B. Lower

**TOWN:** 55N

**GEOLOGIST:** B. Eustice

**RANGE: 33W**

**DRILL METHOD:** Vibecore

**SECTION: 33**

**TOTAL DEPTH:** 0.83' in 6.6' of water

**LOCATION DESCRIPTION:** Quincy Mining Company Portage

**ERNIE ID# 31000098**

|                   |                          |
|-------------------|--------------------------|
| VERTICAL DATUM:   | LATITUDE: 47.114547625   |
| GRD. ELEVATION:   | LONGITUDE: -88.496671411 |
| T.O.C.:           | PROJECTION: MiGeoRef     |
| S.W.L.:           | NORTHING: 732189.699     |
| CASING:           | EASTING: 310448.771      |
| SCREEN:           |                          |
| WELL DEPTH:       |                          |
| COMPLETION NOTES: |                          |



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## BOREHOLE LOG

BORING/WELL: QMCP-SD12

# SITE: Abandoned Mining Wastes Torch Lake

COUNTY: Houghton

DATE: 9/6/2018

TOWNSHIP: Osceola

DRILLER: B. Lower

TOWN: 55N

GEOLOGIST: B. Eustice

RANGE: 33W

DRILL METHOD: Vibecore

SECTION: 33

TOTAL DEPTH: 5.1' in 7.5' of water

LOCATION DESCRIPTION: Quincy Mining Company Portage

ERNIE ID# 31000098

| WELL<br>CONSTRUCTION | LITHOLOGIC<br>LOG | DESCRIPTION                                                                               | DEPTH | SAMPLE TYPE | SAMPLE ID        | NOTES | Water Quality<br>Meter |
|----------------------|-------------------|-------------------------------------------------------------------------------------------|-------|-------------|------------------|-------|------------------------|
|                      |                   | Lake Bottom                                                                               | 0     |             |                  |       |                        |
|                      |                   | <b>FINES</b><br>Brown, with organics (mostly in top 1ft), cohesive,<br>nonplastic, loose. |       |             | QMCP-SD12-0-12"  |       |                        |
|                      |                   |                                                                                           |       |             | QMCP-SD12-12-23" |       |                        |
|                      |                   | No recovery                                                                               |       |             |                  |       |                        |
|                      |                   |                                                                                           | 5     |             |                  |       |                        |
|                      |                   | E.O.B.                                                                                    |       |             |                  |       |                        |

VERTICAL DATUM:

GRD. ELEVATION:

T.O.C.:

S.W.L.:

CASING:

SCREEN:

WELL DEPTH:

COMPLETION NOTES:

LATITUDE: 47.117938616

LONGITUDE: -88.495962233

PROJECTION: MiGeoRef

NORTHING: 732564.678

EASTING: 310514.519



**SITE: Abandoned Mining Wastes Torch Lake**

**BORING/WELL:** QMCP-SD13

**COUNTY:** Houghton

**DATE: 9/7/2018**

**TOWNSHIP:** Osceola

**DRILLER:** B. Lower

**TOWN:** 55N

**GEOLOGIST:** B. Eustice

**RANGE: 33W**

**DRILL METHOD:** Gas Powered Post Pounder

**SECTION: 33**

**TOTAL DEPTH: 8' in 3.8' of water**

**LOCATION DESCRIPTION:** Quincy Mining Company Portage

**ERNIE ID# 31000098**

|                   |  |                          |
|-------------------|--|--------------------------|
| VERTICAL DATUM:   |  | LATITUDE: 47.118525650   |
| GRD. ELEVATION:   |  | LONGITUDE: -88.492531923 |
| T.O.C.:           |  | PROJECTION: MiGeoRef     |
| S.W.L.:           |  | NORTHING: 732621.630     |
| CASING:           |  | EASTING: 310776.703      |
| SCREEN:           |  |                          |
| WELL DEPTH:       |  |                          |
| COMPLETION NOTES: |  |                          |



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## BOREHOLE LOG

BORING/WELL: QMCP-SD14

# SITE: Abandoned Mining Wastes Torch Lake

COUNTY: Houghton

DATE: 9/7/2018

TOWNSHIP: Osceola

DRILLER: B. Lower

TOWN: 55N

GEOLOGIST: B. Eustice

RANGE: 33W

DRILL METHOD: Gas Powered Post Pounder

SECTION: 33

TOTAL DEPTH: 7' in 0.7' of water

LOCATION DESCRIPTION: Quincy Mining Company Portage

ERNIE ID# 31000098

| WELL<br>CONSTRUCTION | LITHOLOGIC<br>LOG | DESCRIPTION                                                  | DEPTH | SAMPLE TYPE | SAMPLE ID        | NOTES | Water Quality<br>Meter |
|----------------------|-------------------|--------------------------------------------------------------|-------|-------------|------------------|-------|------------------------|
|                      |                   | Lake Bottom                                                  | 0     |             |                  |       |                        |
|                      |                   | <b>SAND</b><br>Dark brown, medium grain, well sorted, moist. |       |             | QMCP-SD14-0-12"  |       |                        |
|                      |                   | <b>SAND</b><br>Brown, medium grain, well sorted, moist       |       |             | QMCP-SD14-12-36" |       |                        |
|                      |                   |                                                              |       |             |                  |       |                        |
|                      |                   |                                                              |       |             |                  |       |                        |
|                      |                   | No recovery                                                  | 5     |             |                  |       |                        |
|                      |                   |                                                              |       |             |                  |       |                        |
|                      |                   | E.O.B.                                                       | 10    |             |                  |       |                        |

VERTICAL DATUM:

GRD. ELEVATION:

T.O.C.:

S.W.L.:

CASING:

SCREEN:

WELL DEPTH:

COMPLETION NOTES:

LATITUDE: 47.113643073

LONGITUDE: -88.496077822

PROJECTION: MiGeoRef

NORTHING: 732087.786

EASTING: 310490.592

## APPENDIX G

### LABORATORY ANALYTICAL REPORTS



## **Appendix G**

### **Laboratory Analytical Reports**

#### **Bound Separately**

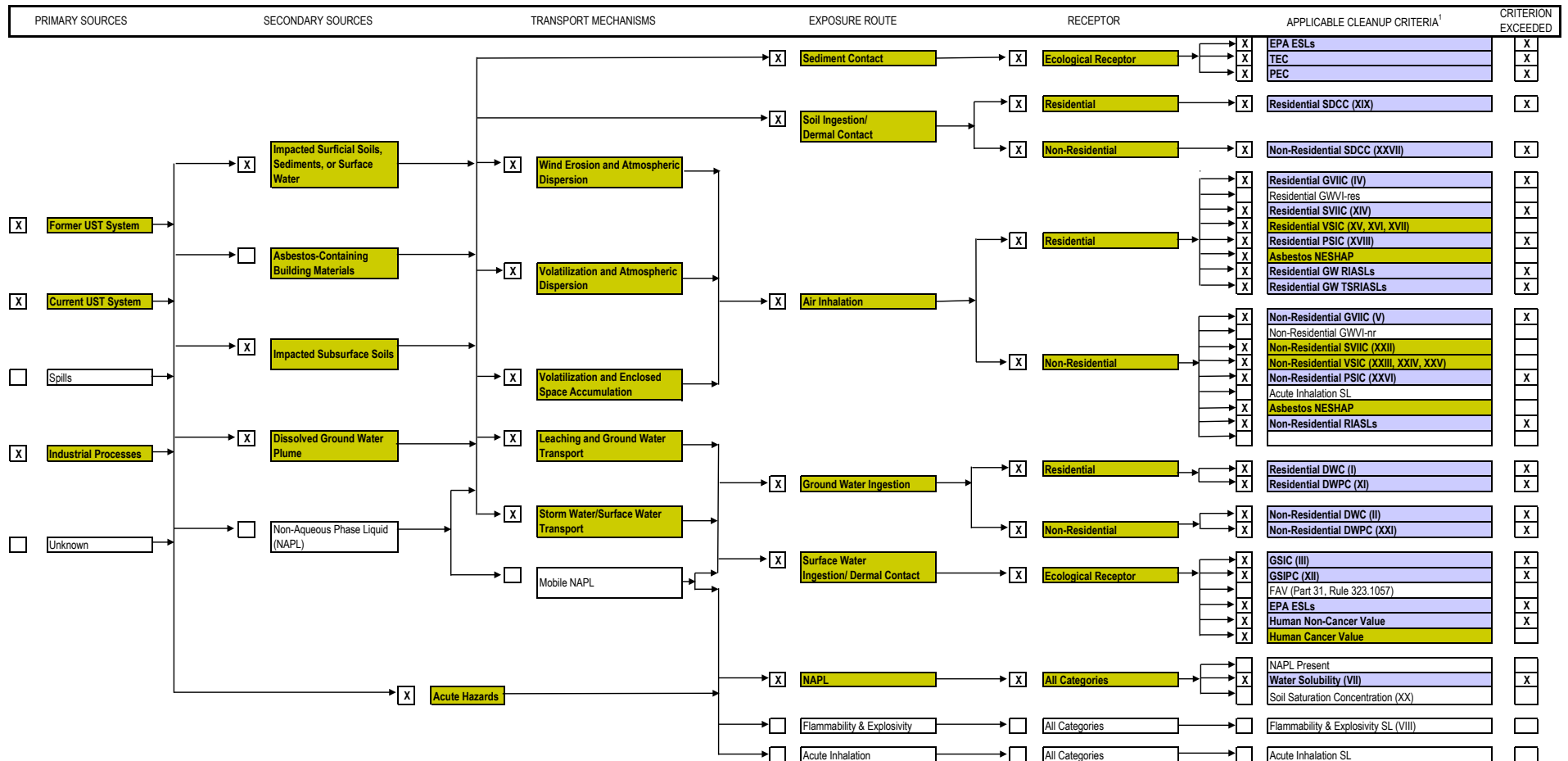


## APPENDIX H

### CONCEPTUAL SITE MODEL – EXPOSURE PATHWAY EVALUATION



**Conceptual Site Model - Exposure Pathway Evaluation**  
 Quincy Mining Company Portage Operations Area  
 Abandoned Mining Wastes - Torch Lake Non-Superfund Site



**Notes:**

- ☒ Indicates this portion of exposure pathway is present at QMCP.
- ☒ Indicates this criterion is exceeded at QMCP.

<sup>1</sup> DEQ-RD Op Memo 1 (updated December 30, 2013), unless otherwise noted

Roman numerals indicate EGLE criterion number

<sup>2</sup> Classification (Adapted from EGLE Op Memo 3)

- 1 Immediate (Exposure is currently occurring).
- 2 Short term threat (between 0 and 2 years until exposure)
- 3 Long term threat (more than 2 years until exposure)
- 4 No demonstrable long-term threat

Future Classification - Classification expected if remedy is successful.

Drinking water and groundwater/surface water pathway criteria exceedances for metals are excluded from the evaluation.