SITE INVESTIGATION REPORT

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

JANUARY 2019

PREPARED FOR:

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
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) DEQ Abandoned Mining Waste (Site ID: 31000098). This SI summarizes previous studies and recent Michigan Department of Environmental Quality (MDEQ) investigations completed in the Quincy Mining Company Mason Operations Area (QMCM), 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) prepared by MSG in response to a request from the MDEQ, 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 is characterized by the risks posed by chemical containers and residues historically discarded in or near Torch Lake. 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 and the surrounding areas identified by the MDEQ include 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 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 in future investigations.

The risks posed to human health and environmental media resulting from historical mining era industrial operations:

- Present potential exposure risk to human and ecological receptors;
- Limit the recovery of the Torch Lake ecosystem;
- Create uncertainty over safe and beneficial reuse of the land; and,
- Prevent 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 the Project was to support a comprehensive management approach that will guide MDEQ's decision making process in addressing potential human health and environmental risks present in the QMCM. The primary focus of the Project is to ascertain the source, nature, and extent of contaminants (including PCBs) in all affected environmental media (soil, groundwater, surface water, and sediments) within Torch Lake, including former Quincy Mining Company-operated industrial areas along the Torch Lake shoreline, summarized as follows:

- Quincy Stamp Mills;
- Quincy Reclamation Plant; and,
- Quincy Stamp Sands.

This SI Report assimilates information from multiple data sources into a logical and thorough narrative focused on the southern portion of Torch Lake, defined in the document as the QMCM. The findings presented herein were developed using the conclusions derived from archival research, historical 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 Torch Lake.

Due to the sizeable nature of the QMCM, 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 upland and in lake study areas within the QMCM. 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 operational areas included in the QMCM. **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** provides detailed findings including figures and tables summarizing analytical results for the QMCM. **Section 6** includes a summary of conclusions and recommendations. **Section 7** includes references utilized in the development of this SI Report.

The submittal of the QMCM SI Report marks a significant milestone in the assessment of environmental impairments within Torch Lake and industrial areas along the shoreline caused by historical mining and industrial operations not addressed under the EPA Superfund Program that are limiting the recovery of the Torch Lake ecosystem and reuse of former industrial areas.

Environmental impacts in the QMCM are generally characterized by detections of organic and inorganic contaminants in soil, sediment, and to a lesser extent groundwater and surface water; repercussions of mining era operations in the region. The following provides a summary of findings derived from the assessment of the QMCM with respect to the goals and objectives for the Project relative to the MDEQ criteria at the time of Project completion:

- Significant in-lake sources of contamination are present in the form of inorganic chemicals of concern (COCs) and some polynuclear aromatics (PNAs) in the study area;

- Significant terrestrial sources of contamination are present in the form of inorganic COCs, cyanide, PNAs, VOCs, and asbestos in the study area;

- No in-lake or terrestrial uncharacterized waste deposits were identified in the study area;

- Industrial ruins, including buildings, foundations, and building floors associated with the mill ruins are present. Voids noted where it appears soil has settled into the subsurface near the mill ruins pose a potential physical hazard due to slip, trip, and fall concerns. Significant areas of mining era ACM in building debris were observed in the study area; and,

- The uncapped portion of QMCM west of Highway M-26 has not been improved since the mining era and features widespread disposition of tailings and stamp sand within and proximal to the stamp mill ruins and widespread debris. Items of concern include abandoned containers some of which are rusting carcasses, some containing solidified or granular waste, and ubiquitous ACM that are distributed across the properties. Further, these abandoned containers and ACM are exposed to weathering and potential migration via storm water runoff and wind dispersion. Access to the property west of M-26 is unrestricted and is frequented by recreational users.

Although PCBs were not detected in sediment samples collected from the QMCM, sediment samples collected from locations in Torch Lake outside of the conceptual boundaries of the QMCM did contain detections of PCBs. The majority of these PCB detections were in sediment samples that were collected from the shallow or surface interval of sediment. Although not specific to the QMCM, these sample analytical results provide a broad view of sediment quality, as it relates to PCB contamination, across Torch Lake.

The historical Torch Lake sediment samples combined with the QMCM sediment sample results provide a profile of PCB contaminant distribution within the sediments of Torch Lake. Although PCBs were not detected in the QMCM, the interpreted results clearly show two distinct groupings of Total PCB concentrations in the CHLL portion of Torch Lake that exceed applicable regulatory criteria: The first grouping is located offshore in the Lake Linden Recreation Area and the second is located offshore in the Hubbell Processing Area.

The Project provided a comprehensive evaluation of the terrestrial and Torch Lake portions of the QMCM 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 Torch Lake 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 MDEQ divisions, property owners, and other governmental entities.

Specific next Project steps include:

- Given current land use considerations, the uncontrolled nature of the identified ACM merits immediate response actions to control potential exposure to contaminants. Once these uncontrolled conditions have been stabilized and exposure risks have been evaluated, long-term remedial objectives can be evaluated. To ensure compliance with regulatory statutes, human health and ecological risks should minimally be qualitatively evaluated with parcel-specific data to determine if risks to the public health, safety, or welfare or to the environment are likely.

- The identified contaminants and their uncontrolled nature, including numerous uncharacterized abandoned containers, merit immediate response actions to control and prevent continued human and ecological interaction and migration of contaminants from the terrestrial portions of the study area. Once these uncontrolled conditions have been stabilized and exposure risks have been evaluated, long-term remedial objectives can be evaluated.

- MDEQ should continue to coordinate with EPA Emergency Response Branch (ERB) on the EPA assessment and removal activities.

- Continue assessment and delineation of affected areas as needed to support risk assessment and remediation/removal planning and implementation.

- Request that responsible stakeholders confirm 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.

- 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.

- 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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1. INTRODUCTION

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1.1 PROBLEM DEFINITION

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- Quincy Reclamation Plant; and,
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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 in a timely manner, 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 the MDEQ, building on the existing partnerships and stakeholder engagement in the local community. Similarly, the MDEQ also sought to develop a collaborative management approach that included staff and resources from Michigan Technological University (MTU). Field activities were completed by the MDEQ Geological Services Unit (GSU) and MSG. Analytical services were provided by the MDEQ's Environmental Laboratory or approved laboratories within the Contract Laboratory program.

Project Structure

The Project study area is located along the shoreline and in Torch Lake, Houghton County, Michigan and copper processing facilities in Dollar Bay (former smelter and wire mill), Ripley Waterfront (Quincy Smelting Works and associated supporting industries along the Portage Lake and Canal), the 270+ acre Centennial Mine, the Michigan Smelter, Freda/Redridge and other areas congruent with the Torch Lake Superfund Site where the response action has been limited to the application of the vegetative cover or eliminating the area from further consideration.

The vast distribution of these former mining operations throughout the region (spanning multiple townships, villages and cities in Houghton County along the Portage Canal, Lake Superior, Slaughterhouse Creek, and Torch Lake) required that operational areas of the mining companies be divided into geographic areas. Dividing the regional operations into smaller manageable geographic areas allowed for prioritization of the proposed investigative approach, while also establishing a phased process for assessing environmental concerns regionally.

The 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*. QMCM is centralized around the company's copper mining and processing operations near Mason, Michigan. Major historical industrial operations within the QMCM included:

- Quincy Stamp Mills;
- Quincy Reclamation Plant; and,
- Quincy Stamp Sands.

The aforementioned areas that comprise the QMCM are depicted on ***Figure 1-2***, *Quincy Mining Company Mason Operations Area – 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-1800's and the mid-1900's. 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 QMCM while also presenting the underlying rationale for the performance of the investigative activities.

2.1 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 QMCM.

2.1.1 Site History

The QMC generally operated in the region between 1892 and 1967 erecting and operating various industrial facilities including, but not limited to copper ore processing facilities such as stamp mills, smelters, reprocessing, flotation, and leaching plants, and laboratories. Consistent with past industrial practices, mining and plant operation wastes were used as fill material along the shoreline of Torch Lake. The company also used portions of the QMCM for the direct disposal of plant wastes. A primary component of these wastes includes tailings, or stamp sands that are a byproduct of the mineral processing activities conducted at the stamp mills. Stamp sands can generally be described as pulverized, "sand-sized", source-rock that was considered a waste material as copper ore was retained for processing. The stamp sands were generally discharged to Torch Lake via a launder or sluice. The most significant stamp sand deposit within the QMCM is located within Torch Lake, known as the Quincy Stamp Sands or Mason Sands.

With the construction of several facilities between 1892 and 1943, the QMCM was industrialized and continued operations until circa 1967. The MTU February 2015 document entitled *Quincy Mining Facilities on Torch Lake, Narratives and Supporting Documents, Part 1, Phase 3: Building Narratives, Maps, and Documentation Torch Lake Industrial Waterfront, From Mason/Quincy Property to Torch Lake South End (Quincy historic properties), Task 3: Historical Archive Research & Mapping* (**Appendix A**) detailed QMCM's history. Refer to **Section 2.2** for a summary of the major QMCM operations.

Mason Sands Torch Lake EPA Superfund Site as-built drawings (USDA NRCS 2003) indicate that the 225 acre vegetated cap between the Torch Lake Shoreline and Highway M-26 portion of the QMCM was placed as part of the Torch Lake Superfund Site Mason Sands remedial action. The Torch Lake Superfund Site Five-Year Review Report (EPA 2013) indicated that construction was completed in 2002 and that the Mason Sands parcel was deleted from the National Priorities List (NPL) in 2012. The capped areas are subject to an on-going MDEQ operation and maintenance plan. The portion of the QMCM west of Highway M-26 was not addressed as part of the Torch Lake Superfund Site remedial action and has not been improved since the mining era. This portion of the QMCM features widespread disposition of tailings and stamp sand within and proximal to the stamp mill ruins and widespread debris.

2.1.2 Topography and Local Geology

The QMCM is located along the west shore of Torch Lake in Mason, Osceola Township, Houghton County, Michigan. The shoreline in this area was historically characterized by industrial operations that included large-scale dock and shipping facilities. As stated previously, waste materials, such as stamp sand, were also deposited along the shoreline, dramatically changing the natural shoreline and lake bottom of Torch Lake.

At a mean elevation of approximately 600 feet (ft) Above Mean Sea Level (AMSL) at the shoreline of Torch Lake, the land rises vertically to the west/northwest 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 the village of Mason which features residential and commercial developments that are generally built up along the toe of the hillside on the west side of M-26 and extending toward Torch Lake. Beyond this centrally developed area, the grade continues to increase towards the west/northwest, away from the lake, 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 village of Dollar Bay is located to the south of the QMCM, where elevations generally remain around 620 ft AMSL.

QMCM is located within the Lake Superior Basin and the Keweenaw Peninsula Watershed. There are small creeks and streams that discharge to Torch Lake within the QMCM, the largest of which is the Quincy Creek. Wetland areas are designated along the south shore of Torch Lake, southwest of QMCM.

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 QMCM generally consists of soils that have been covered by fill in upland areas in the vicinity of Highway M-26. Closer to the shore of Torch Lake, areas of stamp stand and similar wastes are more predominant.

- For soils in portions of developed areas of the QMCM, 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."

- For soils located in upland areas near the developed areas of QMCM, the USDA generally describes the soils as dissected uplands that are moderately to very deep and moderately to somewhat excessively well drained. The "uplands have parallel ravines 45 to 300 feet apart. The ravines are 5 to 15 feet deep and 20 to 50 feet wide and have strongly sloping side slopes. The ravine bottoms are 5 to 20 feet wide. Most have seasonal streams."

- Along the shoreline in areas where wastes and stamps sands have been deposited the USDA generally describes the soils as "…waste material from past copper mining. The material consists of sand-sized waste material from copper stamping mills. Most of the sand was deposited in Torch Lake, Portage Lake, and Lake Superior by pipeline and formed delta-like deposits. Individual areas of this unit are oval or irregular in shape and range from 5 to 100 acres in size. This unit is poorly suited to most uses. It is very susceptible to wind erosion."

Underlying these near surface soils are native soils described in the *Site Inspection Report for Quincy Mason Operations, M-26, Along the Torch Lake Shoreline, Osceola Township, Michigan, 49913 – April 2, 2015* prepared by the MDEQ-RRD SFS, Pre-remedial Group, Site Evaluation Unit (Pre-remedial Group) as "shallow glacial deposits overlying bedrock. The glacial deposits are relatively thin ground moraines typically consisting of coarse-textured glacial till, only zero to 50 feet thick to the east and west of the Site. Some thicker lacustrine sand and gravel deposits are found to the north, up to 200 feet thick. The depth of these deposits in the general area of the Site is approximately 11 to 50 feet. The bedrock in the area of the Site consists of Jacobsville sandstone to the southeast and Portage Lake Lava Series to the west and northwest."

Soil observations during the SI activities indicate that the subsurface at the Quincy Stamp Mills area east of M-26 is generally comprised of topsoil or cap material underlain by gray medium grained sands to silty sands (stamp sands), transitioning to reddish brown sands at variable depths between 1 to 6 ft bgs or deeper. In areas without topsoil or a cap cover, surface soils generally range from gray stamp sands to brownish fine to coarse sand with occurrences of organics and gravel.

2.1.3 Local Hydrogeology

The Site Inspection Report for Quincy Mason Operations, M-26, Along the Torch Lake Shoreline, Osceola Township, Michigan, 49913 – April 2, 2015 prepared by the MDEQ-RRD SFS, Pre-remedial Group states that drinking water within a four-mile radius of the QMCM is obtained entirely from groundwater sources. The Pre-remedial Group stated that the Village of Mason's residents are serviced by two wells located within one-quarter of a mile of the Site; however, it has since been reported that the Mason wells are currently out of service and that the village obtains its water through an extension of a neighboring system. The two municipal wells that make up this system are located approximately 2.5 miles southwest of the Project area in Dollar Bay and service additional Osceola Township residents. Three additional municipal wells located approximately 3.5 miles southwest of the Project area on the south shore of Portage Lake 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 QMCM, 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 report include a comprehensive assessment of water service in the QMCM.

The Pre-remedial group concluded that, based on geological composition, that the shallow glacial aquifers and bedrock aquifers in the region were likely interconnected. As noted in the preceding subsection, Quincy Creek and several other small streams drain to Torch Lake in the QMCM. Torch Lake drains to Portage Lake and the Keweenaw Waterway connecting the inland lake to Lake Superior.

During the SI activities, saturated soil conditions were generally encountered between depths of 2 ft and 8 ft bgs. However, some borings did not encounter groundwater at depths up to 12 ft bgs where refusal was encountered.

2.1.4 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.

Ultimately 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 are put in place to protect the covered materials' long-term integrity. Through these measures it was concluded that the following Remedial Actions 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 Project area is located within the Torch Lake Superfund Site footprint; however, the properties west 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. The only properties included in the SI that underwent previous remedial activities by the EPA are the capped portions of the QMCM. OU2, for which EPA selected a no-action alternative, includes groundwater, surface water, submerged tailings (stamp sands), and sediment that were also investigated.

Historically, numerous environmental investigations and response activities have been completed within the QMCM by state and federal agencies as well as private parties. The investigations were conducted on and along the shoreline of Torch Lake 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 the MDEQ 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 Mason Operations Area* dated February 2017 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 QMCM 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 areas of the QMCM were delisted from the Torch Lake Superfund Site 2012. The MDEQ has taken responsibility for operation and maintenance activities in those areas where remedial actions have been implemented and subsequently delisted. The uncapped portion of QMCM west of Highway M-26, however, has not been improved since the mining era and features widespread disposition of tailings and stamp sand within and proximal to the stamp mill ruins and widespread debris.

In addition to the remedial activities implemented as part of the Torch Lake Superfund Site, the EPA Emergency Response Branch (ERB) also conducted a removal action to mitigate potential public health risks related to exposed stamp sands that contained elevated arsenic concentrations and drums that contained residual waste. At the request of the MDEQ, EPA's ERB mobilized to the site on 17 November 2008 and removed approximately 30 tons of arsenic contaminated soil and 10 drums containing residual waste. The contaminated soils removal area was backfilled with clean fill.

Investigations in the QMCM have identified elevated levels of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), being predominantly polynuclear aromatics (PNAs), PCBs, metals, and asbestos. Concerns at Torch Lake and the surrounding areas, identified by the MDEQ and others, include known or suspected impacts to groundwater, surface water, sediments, and upland media that were not addressed under the Superfund program. Further, the findings of the MDEQ SI and other investigations confirm that significant quantities of waste are present at terrestrial and offshore locations in and around Torch Lake. In addition, prior investigations have identified RPM, asbestos containing building materials (ACBM), and abandoned containers within the QMCM.

In 2017, the MDEQ RRD evaluated the results of several key studies conducted at the QMCM between 2006 and 2017, including RRD's SI activities in 2016 and 2017. Completion of these activities identified potential threats to human and ecological receptors, including but not limited to: human health risks in the event of direct contact with metals contaminated surface soils, numerous abandoned containers, RPM including one location where lead exceeded Resource Conservation and Recovery Act (RCRA) hazardous waste criteria, and ubiquitous ACBM. Consequently, the MDEQ sought EPA ERB assistance with addressing the threats related to abandoned containers, RPM, and ACBM in a November 9, 2017 *Quincy Mining Company – Mason, Asbestos, Residual Process Materials and Abandoned Containers Request for Assistance.*

2.2 SITE LOCATION AND DESCRIPTION

The QMCM consists of approximately 300 acres of land extending approximately two miles along the shoreline of Torch Lake and incorporates seven different parcels with multiple property owners. The SI was organized by the three major historical industrial operations in the QMCM.

The QMCM investigative area and the respective former industrial sites are summarized as follows:

- Quincy Stamp Mills;
- Quincy Reclamation Plant; and,
- Quincy Stamp Sands.

The industrial areas defined above are depicted on ***Figure 1-2**, Quincy Mining Company Mason Operations Area – Area Features Map*. The following subsections provide additional detail related to the study areas identified above.

2.2.1 Quincy Stamp Mills

The Quincy Stamp Mills is the northern-most portion of the QMCM, located along the shoreline of Torch Lake in Mason, approximately six miles north of Hancock. The Quincy Stamp Mills include the stamp mills and associated buildings and lands adjacent to the former industrial facility that were negatively impacted by the former industrial operations. The area east of M-26 was capped as part of the EPA's Torch Lake Superfund remedial action. The Quincy Stamp Mills was comprised of the following primary facilities that supported the processing of copper ore from QMC mineshafts north of Hancock:

- Quincy Stamp Mill No. 1;
- Quincy Boiler House No. 1;
- Quincy Stamp Mill No. 2;
- Quincy Boiler House No. 2;
- Quincy Pump House No. 2; and,
- Quincy Turbine (Power) House.

The general locations of these former structures are depicted on ***Figure 2-1***, *Location and Features Map (Quincy Stamp Mills)*.

As documented by MTU, Quincy Stamp Mill No. 1 was constructed between 1888 and 1890 by the QMC. The company's first milling facility was originally located on the north shore of the Portage Lake in Hancock, Michigan; however, the company was forced to relocate to Mason with the passage of the federal River and Harbor Act of 1886. Stamp Mill No. 1 processed amygdaloid ore from the QMC's mines located at the top of Quincy Hill. The construction of the Quincy & Torch Lake Railroad was also underway at this time and would be used to transport ore material from the mineshafts in Hancock to the new Mason processing location. Quincy Stamp Mill No. 1 was supported by an in-house boiler that was constructed at the same time as the mill. Quincy Boiler House No. 1 and additional pump engines located in Quincy Stamp Mill No. 1 generated steam using two streams running through the operation as a water supply. A third steam stamp would be added to the mill in 1892. A mineral house addition was added in 1904 to house processed material prior to transporting it to the smelter in Ripley. A building extension was added in 1918, with two additional steam stamps added to Stamp Mill No. 1 in 1920.

Between 1898 and 1900, the QMC constructed Quincy Stamp Mill No. 2, located approximately 600 feet north of Stamp Mill No. 1. Quincy Stamp Mill No. 2 contained three steam stamps, along with its own boiler and pump houses. Quincy Boiler House No. 2 supplied steam to power the heads of stamps located in Quincy Stamp Mill No. 2, while Quincy Pump House No. 2 was built to supply water to Quincy Stamp Mill No. 2, but was also used for fire suppression. Water was supplied to Quincy Pump House No. 2 through an adit to Torch Lake. Quincy Stamp Mill No. 2 and its associated boiler and pump houses ceased operation in 1921. Quincy Stamp Mill No. 2 was never reopened presumably because of a weak market due to copper stockpiled during World War I. It is reported that following its closure, Quincy Stamp Mill No. 2 was serviced with limited utilities for heat and electricity for the next two decades; however, the building was dismantled by the late 1940s.

Around the time the stamp mills were built, ancillary structures used to facilitate the processing operations were also constructed within the Quincy Stamp Mills area. These structures included Dock No. 1 that was built in 1888 along the shoreline of Torch Lake. This dock was expanded in 1891 and again in 1901, although it is unknown when the structure was removed. Dock No. 2 was built in 1899 to service Quincy Stamp Mill No. 2. The second dock was built on pilings and conveyed coal directly to Quincy Boiler House No. 2. This dock was dismantled prior to 1953. A 4,000-ton capacity coal shed was built in 1901, along with three steel coal-unloading towers. Conveying machinery was added in 1917 to transport coal from the coal dock to Quincy Boiler Houses No. 1 and No. 2. The towers were scrapped for steel in 1948 and it is unknown when the coal shed ceased operation.

In an effort to reduce its dependence on the Houghton County Electric Company, QMC built the two-story Turbine (Power) House, which housed a 2,000 kilowatt mixed-pressure steam turbine and generator in 1921. The turbine provided most of the electricity needed in Quincy Stamp Mill No. 1 and reduced coal consumption by using the exhaust steam from the mill's stamps in order to operate. With the closing of Quincy Stamp Mill No. 1 in the 1940s, the turbine building was also closed.

Flotation using the chemical xanthate was included in the processing operation at Quincy Stamp Mill No. 1 by 1930. However, from 1932 to 1937, during the height of the Great Depression, QMC operations, including processing at Quincy Stamp Mill No. 1 shut down. Operations in QMC's mines and milling facilities resumed in 1937; however, by 1945, Quincy Stamp Mill No. 1 was closed permanently. It has been reported that a machine shop located adjacent to Quincy Stamp Mill No. 1 was in use into the 1950s. In the early 1960s, a fire destroyed much of the mill building.

The areas of interest within the Quincy Stamp Mills footprint are generally bound to the east by Torch Lake and to the west by a present day multi-use trail. Properties within the Quincy Stamp Mills are both municipally and privately owned.

The Quincy Stamp Mills is generally characterized as being a former industrial area. The industrial footprint of the stamp mill complex, including the locations of former buildings is depicted on ***Figure 2-1,*** *Location and Features Map (Quincy Stamp Mills).* Refer to ***Appendix A,*** *MTU Historical Summary,* for the summarized historical account prepared by MTU, pertaining to the Quincy Stamp Mills Area, and specifically Stamp Mill No 1 and No. 2 and associated buildings.

2.2.2 Quincy Reclamation Plant

The Quincy Reclamation Plant is located on the east side of Highway M-26, southwest of the Quincy Stamp Mills. Improvements to milling technology allowed for the reprocessing of stamp sand waste product to reclaim additional copper that was in the stamp sand. The area was capped as part of the EPA's Torch Lake Superfund remedial action. As the operational focus shifted towards reclamation, QMC adopted the technology to process stamp sands using a floatation treatment around 1929; however, due to the shut down during the Great Depression, it would take the company until 1942 to determine a strategy to begin the construction on a reclamation plant. With an advance from the federal Metals Reserve Company (MRC) and initial oversight by C&H, QMC began construction on the reclamation plant complex in 1942. By late 1943, the plant was fully functional, processing tailings retrieved from dredging portions of Torch Lake.

The Quincy Reclamation Plant was constructed to the south of the Quincy Stamp Mills and was comprised of the following primary facilities:

- Quincy Regrinding Plant;
- Quincy Shore Plant; and,
- Quincy Dredge No. 2.

The locations of these former structures are depicted on ***Figure 2-2,*** *Location and Features Map (Quincy Reclamation Plant).*

As part of the reclamation plant complex, the Quincy Regrinding Plant, which had originally been owned by C&H, was dismantled, transported, and re-erected at the QMC location in Mason. In 1945, a 41-ft building addition was constructed on the south side of the Quincy Regrinding Plant. It has also been reported that the Quincy Shore Plant and conveyor system that was in place had also come from C&H's Lake Linden facility.

Machinery in the Quincy Shore Plant was used to dewater dredged tailings prior to regrinding. The building contained classifying equipment and conveyors used to move material to the Quincy Regrinding Plant. Coarse material was transported to the "surge bin," which fed the ball mills of the Quincy Regrinding Plant, whereas fine material, or "slimes" was fed directly to the flotation process. Coarse sand was ground into a fine powder using steel balls inside conical drums to pulverize the material. Stamp sands would move through a series of concentrating machines and again be classified in order to separate copper-poor material from copper-rich material. The copper-rich material was to be treated by the flotation process. During this process, water and pine oil were agitated to create a froth. A chemical reaction occurred when xanthate was added that would cause copper particles to adhere to the froth. The copper-bearing froth was skimmed from the top, dewatered, and transported to the smelter. The post-reclamation tailings, which still contained copper, were deposited back into Torch Lake via launders at the foot of the Regrinding Plant forming the Quincy Stamp Sands.

The Quincy Reclamation Plant was powered by electricity that was purchased from C&H. Electricity that ran from C&H's power plant in Lake Linden entered the reclamation plant through a substation located at the northwest corner of the building. Oil-filled transformers were also located at the northwest corner. In addition, three smaller transformers were associated with the Quincy Shore Plant; however, it is uncertain whether they contained oil.

Quincy Dredge No. 1 was built in 1943 and was initially used to recover in-lake deposits located to the south of Stamp Mill No. 1. It sank in Torch Lake in January 1956 in 55 feet of water, but was replaced by a second dredge that was purchased from C&H. By the mid-1950s, the dredge was used to recover material from the sand bank near Quincy Stamp Mill No. 2. Oil-filled transformers along with a circuit breaker were known to be located on the first dredge when it sank. The second dredge ceased operations in 1967, but remains along the shoreline in Mason. The Quincy Reclamation Plant ceased operations in June 1967 and stood idle for a few years before it was dismantled.

The areas of interest are generally bound to the west by Highway M-26 and to the east by Torch Lake. The study area is generally characterized by residential properties in the west with the focus of the SI being placed on the former industrialized areas east of the multi-use trail. Properties within the vicinity of the Quincy Reclamation Plant are generally privately owned.

The Quincy Reclamation Plant is generally characterized as being a former industrial area. The industrial footprint of the reclamation complex, including the locations of former buildings, is depicted on ***Figure 2-2,*** *Location and Features Map (Quincy Reclamation Plant)*. Refer to ***Appendix A,*** *MTU Historical Summary*, for MTU's historical account of the Quincy Reclamation Plant.

2.2.3 Quincy Stamp Sands

The Quincy Stamp Sands are located south of the Quincy Reclamation Plant and east of Highway M-26 along the shoreline and within Torch Lake. The area is generally accessible to pedestrian traffic. The area was capped as part of the EPA's Torch Lake Superfund remedial action. Further, the capped stamp sands are wastes associated with the industrial operations in the QMCM. Since salvage and disposal operations during the decommissioning of the industrial facilities are not well documented there was also reason to investigate, as part of this Project, the potential for contaminant sources to be deposited with the stamp sands.

The Quincy Stamp Sands area is bound to the west by Highway M-26 (near the original shoreline of Torch Lake) and to the east by Torch Lake. The Quincy Stamp Sands is both municipally and privately owned and is generally characterized as waste deposits. The location of the Quincy Stamp Sands is depicted on ***Figure 2-3,*** *Location and Features Map (Quincy Stamp Sands)*. ***Appendix A,*** *MTU Historical Summary,* contains MTU's historical account of the Quincy Stamp Sands.

2.2.4 Torch Lake

The study area described in the preceding subsections is located along the shoreline of Torch Lake. Each of these former industrial operations relied on the waters of Torch Lake 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.

Historically, containers, drums, and building materials have been identified in Torch Lake. Some of these items were characterized and recovered as part of previous removal actions; however, many areas of similar waste deposits remain submerged or partially submerged along the shoreline of the lake. In addition, the abandoned or vacant state of the properties in several locations make Torch Lake susceptible to the erosion or discharge of contaminated environmental media emanating from properties along the shoreline.

Numerous investigations have been completed in Torch Lake in order to evaluate sediment and water quality within the lake. PCBs have been detected in sediment and surface water in the lake and have resulted in the placement of the following BUIs:

- **Restrictions on fish and wildlife consumption** - When contaminant levels in fish or wildlife populations exceed current standards, objectives or guidelines, or public health advisories are in effect for human consumption of fish and wildlife.

- **Degradation of benthos** - When the benthic macroinvertebrate community structure significantly diverges from un-impacted control sites of comparable physical and chemical characteristics. In addition, this use will be considered impaired when toxicity (as defined by relevant, field-validated bioassays with appropriate quality assurance/quality controls) of sediment associated contaminants at a site is significantly higher than controls.

Despite the effectiveness of these prior investigations in identifying sediment contamination, the investigations were not focused on identifying and characterizing the sources of contamination. As such, the goals of the SI were to assess the presence of these abandoned containers and wastes on the bottom of the lake in the QMCM and to more fully characterize the nature and extent of these likely contaminant sources. The evaluation of potential PCB sources and areas of PCB contamination in and around Torch Lake were an integral component of the SI that will support the long-term protection and rehabilitation of the lake.

3. FIELD PROCEDURES AND SAMPLE COLLECTION

The field procedures and sample collection activities that were implemented in the QMCM 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 QMCM included several research oriented 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 Mason Operations Area, Houghton County, Michigan* (SAP) prepared by MSG in May 2017. 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 the MDEQ.

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 historical archive research and mapping completed by MTU was critical to the development of the SAP since the findings specifically identified the location of facilities and operational areas that were historically utilized by the QMC. The following provides a summary of the activities completed by MTU and the associated research and documentation that was used to support SAP development:

- Identification of potential sources of contaminants of concern (COCs), including PCBs, through the evaluation of waste streams from industrial buildings and processes including, but not limited to, chemicals used in reclamation processes; chemicals produced as byproducts of copper processing; process sludges; process slag; and leaching reagents.

- Investigation of archives related to building function, production processes, chemical processes, and waste streams by building location.

- Production of building narratives for buildings within the QMCM that include details related to operational periods, production activities, operational processes, building use, and information on chemicals, metals, and wastes used in or generated at the facility.

- Completion of mapping activities based on collected archival data and field inspections noting the location of foundations and building remnants.

The findings of the archival research including the elements summarized above were compiled by Carol A. MacLennan, Principal Investigator and Daniel Schneider, Research Assistant, of the Industrial Heritage Program in the MTU Social Sciences Department. The MTU Research Institute (MTRI) supported these efforts by geospatially referencing data sources for visualization in a Geographic Information System (GIS).

A summary of the historical findings reported by MTU is presented on ***Table 3-1***, *Summary of Historical Operations*. A detailed summary report and supplemental information including building narratives, maps, and documentation is included in ***Appendix A***, *MTU Historical Summary*.

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 QMCM and Torch Lake. 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 summary 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 Mason Operations Area dated February 2017*:

- *Archaeological Survey Report of The Quincy Mining Company, Torch Lake Smelter & Reclamation Plant, At Mason Sands, Torch Lake EPA Superfund Site – May 2001*. Prepared by Julia A. Blair & Michigan Technological University Department of Social Sciences Archaeology Laboratory for U.S Department of Agriculture Natural Resources Conservation Service.

- *Final Report, PCB Study Using Semipermeable Membrane Devices in Torch Lake, Houghton County – March 2006*. Prepared by the Great Lakes Environmental Center.

- *Summary Report for the Torch Lake Area Assessment, Torch Lake NPL Site and Surrounding Areas, Keweenaw Peninsula, Michigan – December 2007*. Prepared by Weston Solutions of Michigan, Inc.

- *PCB Concentrations in Walleye Collected from Torch Lake (Houghton County) and Lake Superior - June 2008*. Prepared by the MDEQ Water Bureau.

- United States Environmental Protection Agency, Region V, Pollution Report, Mason Sand Removal – December 12, 2008. Prepared by EPA Emergency Response Branch (ERB).

- *Aroclor Sediment Investigation, Torch Lake Area of Concern, Houghton County, Michigan – June 2009*. Prepared by the EPA Great Lakes National Program Office (GLNPO).

- *Quincy Mining Facilities on Torch Lake, Narratives and Supporting Documents, Part 1, Phase 3: Building Narratives, Maps, and Documentation Torch Lake Industrial Waterfront, From Mason/Quincy Property to Torch Lake South End (Quincy historic properties, Task 3: Historical Archive Research & Mapping* – February 2015. Prepared by Michigan Technological University.

- *Quincy Mining Facilities on Torch Lake, Maps and Blueprints, Part 2, Phase 3: Building Narratives, Maps, and Documentation Torch Lake Industrial Waterfront, From Mason/Quincy Property to Torch Lake South End (Quincy historic properties), Task 3: Historical Archive Research & Mapping* – February 2015. Prepared by Michigan Technological University.

- *Site Inspection Report for Quincy Mason Operations, M-26, Along the Torch Lake Shoreline, Osceola Township, Michigan 49913, U.S. EPA ID NO.:MK000510939-April 2, 2015*. Prepared by the MDEQ-RRD, Superfund Section, Pre-remedial Group.

- *Staff Report, Status of Fish Contaminant Levels in the Torch Lake Area of Concern 2013. January 2016*. Prepared by the MDEQ Water Resources Division.

- *Remotely Operated Vehicle (ROV) Videos for Torch Lake within the QMCM – July 2016.* Prepared by the MDEQ RRD GSU.

- *Preliminary Reconnaissance Observations for QMCM – 24 October 2016.* Prepared by MSG.

- *Baseline Environmental Assessment Conducted Pursuant to Section 20126(1) (c) 1994 PA451, Part 201, as amended and the rules promulgated thereunder for Mason Sands, Houghton County, Michigan – January 2017. Prepared by U.P. Engineers and Architects, Inc. (UPEA).*

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 QMCM 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 in the lake as well as consideration related to historic operations and potential PCB presence.

3.1.3 Offshore Mapping and Procedural Testing

Analytical results from surface water and sediment samples indicated that contaminants emanating from documented contamination on land may be impacting the nearshore aquatic environment of Torch Lake. In addition, historical investigations in the lake have documented the presence of submerged drums, containers, and waste deposits on the bottom of Torch Lake. 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 2016 the MDEQ GSU conducted a side scan sonar survey of the lake bottom in the QMCM using a tow fish and interpreted the results, identifying areas where targets were most likely to be present. 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 the MDEQ GSU are included in ***Appendix B***, *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. The MDEQ GSU deployed their 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 C***, *Underwater Videos*.

3.1.4 Sampling and Analysis Plan Development

The development of the SAP for the QMCM 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 and offshore 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 was also considered to determine if data gaps were present.

The risks posed to human health and environmental media resulting from historical mining era industrial operations:

- Present potential exposure risk to human and ecological receptors;
- Limit the recovery of the Torch Lake ecosystem;
- Create uncertainty over safe and beneficial reuse of the land; and,
- Prevent delisting of Torch Lake as an AOC under the Great Lakes Water Quality Agreement due to BUIs related to restrictions on fish and wildlife consumption because of the on-going presence of PCBs in fish and degradation of benthos because of metals contaminated sediments.

As such, the investigation was largely driven by documented observations of drum and/or other debris locations in the lake as well as consideration related to historic operations and potential PCB concentrations in terrestrial portions of the QMCM. The prevailing COCs in the QMCM 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 methods 6010/200.7, 6020/200.8, 7471/245.5 and ASTM D7284;
- VOCs by 8260;
- PCBs by 8081/8082;
- PNAs by 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 methods 6010/200.7, 6020/200.8, 7471/245.5 and ASTM D7284;
- VOCs by 8260;
- PCBs by 8081/8082; and
- PNAs by 8270

Groundwater

- Inorganic COCs (Metals) by methods 6010/200.7, 6020/200.8, and 7471/245.5;
- VOCs by 8260;
- PCBs by 8081/8082; and
- PNAs by 8270

Sediment

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

Surface Water

- Inorganic COCs (Metals) by methods 6010/200.7, 6020/200.8, 7471/245.5; and,
- PCBs by 8081/8082
- PNAs by 8270

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

- Inorganic COCs (Metals) by methods 6010/200.7, 6020/200.8, 7471/245.5;
- PCBs by 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
- 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 QMCM.

3.2 FIELD PROCEDURES AND SAMPLE COLLECTION

Similar to SAP development, the implementation of field activities in the QMCM 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 four 2017 mobilizations.

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 QMCM included a physical inspection of the properties within the study area. Field inspections were conducted on properties where written access was granted to the MDEQ. 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. The inspections included the locating and inventory of historical structures and artifacts associated with the former mining era operations within the QMCM. The study area was also inspected for potential physical and health hazards. Such hazards may include 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 two field inspection check lists that incorporated photographic documentation and written descriptions of identified features. Reconnaissance activities were completed at all of the properties in the QMCM. A Reconnaissance Log was used to document the general characteristics of the property including the inventory and documentation of mining era features 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 D***, *Site Inspections – Reconnaissance Logs.*

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. The following provides a summary of the various media that were sampled during the targeted inspection activities:

- 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 sampled.

- Documented SACM was sampled by a State of Michigan licensed asbestos inspector. Sampled media included asphaltic roofing material, fibrous materials, paper-like materials, Transite, and caulking material.

- Documented abandoned container contents and RPM were sampled.

Based on these findings all SACM was analyzed for asbestos and abandoned container contents and RPM samples were analyzed for the following target analytes:

- PCBs;
- VOCs;
- PNAs;
- Inorganic COCs;
- Pesticides;

- Herbicides; and,
- Waste characterization parameters.

Grab soil samples were collected from sampling locations. The following provides a summary of the sampling procedures used during the SI.

- Rocks and organic matter (including grasses, shallow vegetation roots, and leaves) were removed from the surface of each location before a sample was collected.

- Hand tools and direct-push boring techniques were used to collect samples from each sampling location.

- Soil 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.

- SACM, waste material, and residual process material sampling utilized the following nomenclature:

  - ASBBLK – Generally described as a SACM sample;
  - DM – Described as a hand-tool collected waste material or soil sample collected in proximity to an abandoned container; and,
  - RPM – Described as a hand-tool collected residual process material sample.

Samples were collected from throughout the QMCM. A total of 87 bulk asbestos samples were collected from the QMCM. Two waste material samples from drums (DM designation) were collected. Seven residual process material samples (RPM designation) were also collected. Each of the sampled perceived hazards listed above was located with a GPS unit with sub-meter accuracy and photographed. Sample identification, time of collection, and a description of the sampled material were documented on a Targeted Inspection Form. Completed Targeted Inspection Forms are included in ***Appendix E***, *Site Inspections – Targeted Inspections*. A summary of the samples collected during the targeted inspection, including their descriptions, requested analyses, and other relevant information is included on ***Table 3-2***, *Sampling and Analysis Summary*.

Findings are provided in **Section 5**.

3.2.2 Geophysical Investigation

During the reconnaissance activities, two historical dump areas were identified east of M-26 near Torch Lake across from the Quincy Stamp Mills. Since surface observations included drum carcasses along with other domestic and industrial-appearing debris, MDEQ-GSU conducted an electromagnetic geophysical survey in April 2017 to evaluate the potential presence of buried drums. Anomalies were identified but were determined to be associated with metallic debris on the ground surface. There did not appear to be any areas of buried metal outside of the surface debris. Copies of the geophysical survey maps are contained in ***Appendix F***, *Geophysical Survey Maps*.

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**. Based on these findings and field observations surface soil samples were analyzed for inorganic COCs with a select subset also analyzed for the following target analytes:

- Cyanide;
- VOCs;
- PNAs;

- PCBs; and,
- Asbestos.

Grab soil samples were collected from proposed surface soil (0-6 in.) sampling locations. In sampling areas where waste deposits or historical surface soils were capped or covered in accordance with the EPA ROD for OU2 in the Quincy Stamp Mills, Quincy Reclamation Plant, and Mason Stamp Sands, surface soil samples were collected from directly beneath the cover media. The following provides a summary of the sampling procedures used during the SI.

- Rocks and organic matter (including grasses, shallow vegetation roots, and leaves) were removed from the surface of each location before a surface soil sample was collected.

- Hand tools and direct-push boring techniques were used to collect soil samples from each sampling location. Grab surface soil samples were collected from the 0 to 6-inch interval of the extracted soil core.

- Soil 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.

- Surface soil sampling utilized the following nomenclature:

  - SS – Generally described as a hand-tool collected surface soil sample; and,
  - SB – Generally described as a direct-push boring collected surface soil sample.

Surface soil samples were collected from throughout the QMCM. A total of 86 surface soil samples (SS or SB designation), including quality assurance (QA)/quality control (QC) samples, were collected from the QMCM. 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 sample collection activities, is included in ***Appendix G**, Photographic Log*. Completed boring logs are included in ***Appendix H**, Boring Logs*. A summary of the samples collected, including their descriptions, requested analyses, and other relevant information is included in ***Table 3-2**, Sampling and Analysis Summary*.

Sampling locations, analytical results, and findings are included in **Section 5** 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**. Based on these findings and field observations subsurface soil samples were analyzed for combinations of the following target analytes:

- Inorganic COCs;
- VOCs;
- PCBs; and
- PNAs.

The MDEQ's GSU utilized a track-mounted direct-push drill rig to retrieve continuous soil cores from the subsurface. Borings were advanced into the groundwater table. 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 soil borings were logged 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.

A stainless steel slotted screen was advanced into the boring and groundwater samples were collected using disposable plastic tubing and a peristaltic pump. The following provides a summary of the sampling procedures used during the SI:

- 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, GSU performed ground penetrating radar activities at the Quincy Stamp Mills dump area to identify any additional underground anomalies prior to the commencement of fieldwork.

- 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.

- Borings were advanced using a 5-foot long, 1.5-inch diameter Macro-Core sampler to collect continuous soil samples at all borings using a motor-driven hydraulic hammer to the desired depth.

- Soil 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.

- Subsurface soil samples were named with an SB descriptor in the sample name.

Subsurface soil samples were collected from throughout the QMCM. A total of 59 subsurface soil samples (SB designation), including QA/QC samples, were collected from the QMCM. 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 sample collection activities, is included in ***Appendix G**, Photographic Log*. Completed boring logs are included in ***Appendix H**, Boring Logs*. A summary of the samples collected during the investigation, including their descriptions, requested analyses, and other relevant information is included on ***Table 3-2**, Sampling and Analysis Summary*.

Sampling locations, analytical results, and findings are included in **Section 5** 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 stainless steel screen reusable sampling rod. Based on the historical findings, or lack thereof, groundwater samples were analyzed for combinations of the following target analytes:

- PCBs;
- VOCs;
- PNAs; and,
- Inorganic COCs.

The following provides a summary of the sampling procedures used during the SI:

- 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.

- 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 to the analytical laboratory under chain of custody.

- Groundwater samples were named with a GW descriptor in the sample name.

Groundwater samples were collected from throughout the QMCM. A total of 34 groundwater samples (GW designation), including QA/QC samples, were collected from the QMCM. 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 sample collection activities is included in ***Appendix G**, Photographic Log*. GSU-completed boring logs documenting the temporary well screen interval are included in ***Appendix H**, Boring Logs*. A summary of the samples collected during the investigation, including their descriptions, requested analyses, and other relevant information is included on ***Table 3-2**, Sampling and Analysis Summary*.

Sampling locations, analytical results, and findings are included in **Section 5** 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**. Based on these findings sediment samples were analyzed for combinations of the following target analytes:

- PCBs;
- PNAs; and,
- Inorganic COCs.

Other sediment sampling locations presented in the SAP were subject to change based on the findings of the underwater surveillance. These locations would be moved with the intent of collecting material from the interior of submerged containers or from identified waste deposits based on GSU underwater imagery targeting, a key element of the SI distinguishing it from previous investigations. Traditional vibracore sampling techniques were used to collect all of the sediment samples from the QMCM. The following provides a summary of the sampling procedures used during the SI:

- Sediment samples were collected utilizing the MDEQ GSU'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.

- Sediment samples were named with an SD descriptor in the sample name.

Sediment samples were collected from Torch Lake, and ponds and channels associated with the Quincy Reclamation Plant. A total of 67 sediment samples (SD designation), including QA/QC samples, were collected from the QMCM. 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 sample collection activities, is included in ***Appendix G**, Photographic Log*. Completed sediment logs are included in ***Appendix I**, Sediment Core Logs and Surface Water Sampling Records*. A summary of the samples collected during the SI, including their descriptions, requested analyses, and other relevant information is included on ***Table 3-2**, Sampling and Analysis Summary*.

Sampling locations, analytical results, and findings are included in **Section 5** of this SI Report.

3.2.7 Surface Water Sampling

Surface water sampling locations were predetermined in the SAP based on the evaluations and assessments presented in **Section 3.1**. Based on these findings surface water samples were analyzed for the following target analytes:

- PCBs; and,
- Inorganic COCs.

The surface water samples were collected from the water column within 1 foot of the water body bottom using a low-flow peristaltic pump and Teflon tubing to pump water from the water body into laboratory-provided sample containers.

Surface water samples were collected from channels associated with the Quincy Stamp Mills and Quincy Reclamation Plant. A total of nine surface water samples (SW designation), including QA/QC samples, were collected from the QMCM. 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 sample collection activities, is included in ***Appendix G**, Photographic Log*. Completed sediment/surface water logs are included in ***Appendix I**, Sediment Core Logs and Surface Water Sampling Records*. A summary of the samples collected during the SI, including their descriptions, requested analyses, and other relevant information is included on ***Table 3-2**, Sampling and Analysis Summary*.

Sampling locations, analytical results, and findings are included in **Section 5** of this SI Report.

3.2.8 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 the MDEQ. 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 the MDEQ. 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 the MDEQ at the end of the project phase. Reusable equipment, including the stainless steel sampling screen, was decontaminated between boring locations using steam-cleaning methods. 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 the MDEQ 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 the MDEQ.

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.

3.2.9 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 utilized 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 MDEQ 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 MDEQ project file.

Laboratory chain-of-custody began with sample receipt and continues until samples are 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 Subsurface Soil Groundwater Surface Water Sediment	MDEQ Environmental Laboratory	3350 N. Martin Luther King Blvd. Lansing, MI 48906-2933	MDEQ Laboratory Services Section Kirby Shane	(517) 335-9800
Drum Contents and RPM for Waste Characterization	ALS Environmental	3352 128th Ave Holland MI, 49424	Alex Csaszar	(616) 399-6070

Matrix	Laboratory Name	Laboratory Address	Laboratory Contact Name	Laboratory Phone Number
Bulk Asbestos and Asbestos in Soil	TestAmerica, Inc.	4101 Shuffel Street NW North Canton, OH 44720	Kris Brooks	(330) 966-9790

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

3.2.10 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 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 MDEQ 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 J***, *Laboratory Analytical Reports.*

4. EXPOSURE ASSESSMENT

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

4.1 MDEQ 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 QMCM exceed residential exposure criteria for one or more COC. Further, analytical results from RPM and drums also exceed residential exposure criteria. Analytical results and their implications on facility status are described further in the detailed findings in **Section 5**, which documents the QMCM as being a facility. It should be noted however, that the QMCM 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 Non-Residential Cleanup Criteria for Response Activity (MDEQ 2013).
  - Surface Soil;
  - Subsurface Soil;
  - Abandoned Container Contents;
  - RPM;
  - Groundwater; and,
  - Asbestos.
- EPA, RCRA, Identification and Listing of Hazardous Waste Criteria (40 Code of Federal Regulations [CFR], Part 261, Subpart C) (EPA 2012).
  - Abandoned Container Contents; and,
  - RPM.
- EPA, National Emission Standards for Hazardous Air Pollutants (NESHAP) (40 CFR, Part 61, Subpart M) (EPA 1984).
  - Asbestos.
- EPA, Region 5, RCRA, Ecological Screening Levels (ESLs) (EPA 2003).
  - Sediment; and,
  - Surface Water.
- MDEQ – Rule 57 Water Quality Values, Surface Water Assessment Section (MDEQ 2014).
  - Surface Water.
- Sediment Quality Guidelines, Threshold Effect Concentrations (TECs) and Probable Effect Concentrations (PECs) (MacDonald, et al, 2000).
  - Sediment.

The regulatory screening criteria summarized above may be applicable to all or select portions of the QMCM. A limiting factor in the assessment of the applicability of these criteria may include, but not be 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 QMCM.

4.2.1 Non-Evaluated Exposure Pathways

The following exposure pathway was not evaluated at the QMCM:

- 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 QMCM.

4.2.2 Non-Applicable Exposure Pathways

The following exposure pathways are not applicable at the QMCM:

- Risks due to free-phase liquids.

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

4.2.3 Relevant Exposure Pathways Where Applicable Criteria Are Not Exceeded

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

- 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 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 nonresidential settings.

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

The following exposure pathways are relevant at the QMCM, 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 QMCM feature capped and vegetated areas along the shoreline of Torch Lake. 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.

- 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 that may result in the volatilization of contaminants to ambient air in residential settings.

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

The following exposure pathways are relevant at the QMCM and the exposure pathways are 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 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 surface water and sediments that have the potential to have toxic effects on aquatic biota and/or enter the food chain.

- Risks posed by hazardous substances in abandoned containers and RPM.

- Risks posed by hazardous substances inside buildings or former building substrates.

Although relevant, the MDEQ drinking water/surface water pathway criteria exceedances for metals are excluded from the soil and groundwater evaluation in the detailed findings included in **Section 5**. 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 the MDEQ drinking water/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 OU2 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 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.

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 the MDEQ 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 QMCM:

- 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, RPM, 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 QMCM. COCs have been identified in surface and vadose zone soils, groundwater, surface water, sediment, RPM, and abandoned containers that have the potential to affect human and ecological receptors, as well as recreational users or consumers of the natural resources of Torch Lake. Further, the potential for particulate migration and dispersion through the air from surface soils and ACBM poses additional risks.

The current and foreseeable land use in the QMCM includes both residential and non-residential; however, historical documentation indicates that this area was highly industrialized through the first half of the 1900's. The extent of these operations included both terrestrial and offshore operations that included the discharge of wastes and debris to Torch Lake. 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 lakeshore. Further, underwater mining era equipment, structures, and 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 QMCM 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. The CSM represented in ***Figure 4-1***, *Conceptual Site Model – Exposure Pathway Evaluation* depicts these relationships under both residential and non-residential land use scenarios.

5. DETAILED FINDINGS

This Section summarizes the results and the subsequent findings for the QMCM 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 QMCM.

5.1 SITE INSPECTION AND INVESTIGATION RESULTS

The implementation of the site inspection and investigation activities provides critical lines of evidence that link the historical documentation and the current environmental conditions in and around Torch Lake. 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 Torch Lake.

5.1.1 Site Inspection

The site inspection at the QMCM included the inventory and locating of historical structures and similar surficial artifacts associated with the former industrial operations in the area. The study area 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.

During April and May 2017, MSG field team personnel performed reconnaissance activities at the properties in the QMCM. 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.

Seven property parcels owned by four entities and totaling approximately 300 acres were visually inspected and observations were recorded. The following provides a summary of the findings associated with the reconnaissance activities.

Reconnaissance Summary	
Potential Chemical or Physical Hazards	**Recorded Observations**
Suspect Asbestos Containing Material (SACM)	SACM are ubiquitous in the QMCM and include Transite siding, roofing materials, felt paper, Thermal System Insulation, caulking, mastics, gaskets, woven fabrics, and tape-wrapped hoses.
Residual Process Materials (RPM)	A portion of the QMCM east of M-26 is a stamp sand deposit created during mining era operations. The stamp sand deposit, a RPM, was largely capped as part of previous remedial actions completed by the EPA. In addition, other RPMs are present in mining era ruins throughout the QMCM.
Potentially Abandoned Containers	23 intact and 73 carcasses of abandoned mining era containers were observed during the inspection of the properties.
Soil Staining/Stressed Vegetation	No barren or stressed areas of the ground surface were documented on the inspected properties, but mining era artifacts and foundations were observed. The QMCM properties west of M-26 have not been capped and are non to sparsely vegetated in areas, featuring either natural soils, stamp sand or mining era debris covering the ground surface. Portions of the QMCM east of M-26 were largely capped as part of previous remedial actions completed by the EPA, but two dump areas and the ground surface around many of the ruins were not capped.
PCB or Mercury Containing Equipment	No potential PCB or mercury containing equipment was observed on the inspected properties.
Other: Household Waste and Structural Voids	Small mounds and partially buried debris including cable, railroad ties, SACM, and potentially abandoned containers were observed within the QMCM. Household waste, including refrigerators, were also observed. Voids were noted amongst the mining era ruins throughout the QMCM.

Numerous significant hazards were identified in the QMCM during the reconnaissance activities. As discussed in **Section 2.1**, the stamp sand deposits east of M-26 have been addressed under previous cleanup and removal actions undertaken in the area. However, the observed ACM and abandoned containers within the mining era structure ruins and uncapped areas are exposed to weathering and potential migration via storm water runoff and wind dispersion. The uncapped portion of QMCM west of Highway M-26 has not been improved since the mining era and features widespread disposition of tailings and stamp sand within and proximal to the stamp mill ruins and widespread debris. Items of concern include abandoned containers some of which are rusting carcasses, some containing solidified or granular waste, and ubiquitous ACM that are distributed across the properties. Further, these debris piles, abandoned containers, and ACM are exposed to weathering and potential migration via storm water runoff and wind dispersion. In addition, several locations on the properties feature structural voids in foundations and floors at or above grade in mining era building footprints. Access to the property west of M-26 is unrestricted and is frequented by recreational users.

Field logs documenting reconnaissance observations are included in ***Appendix D**, Site Inspections – Reconnaissance Logs* of the SI Report. A summary of the identified abandoned containers and RPM is provided in ***Appendix K**, Abandoned Containers and RPM Summary.*

5.1.1.1 Targeted Inspection

The qualitative assessment of the reconnaissance findings in the QMCM warranted the performance of targeted inspection activities. RPM and drum sampling occurred on 16 and 17 May 2017 by a MSG and MDEQ-GSU field team. Bulk materials samples for asbestos analysis were collected between 24 and 26 May 2017 by a MSG field team. The following subsections summarize the findings of these sampling efforts.

5.1.1.1.1 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, including the outside of buildings, within debris piles, and atop the foundations and floors of demolished mining era structures. The sampling approach used when conducting a traditional asbestos survey is based upon the building's functional spaces and homogeneous areas of intact building materials. These regulatory criteria determine the quantity and location of bulk samples to be collected. Since the asbestos survey was limited to non-intact debris, the traditional asbestos sampling approach could not be directly applied. Although the SACMs were not intact, the quantity of bulk samples collected per similar types of building materials were consistent with the sampling requirements defined in 40 Code of Federal Regulations (CFR) 763.83 "Sampling".

A total of 210 bulk samples were collected from 87 different SACMs as part of the SI, with 28 of the materials sampled in 2013 and 2017 containing greater than 1% asbestos. ACM identified on properties within the QMCM included Transite siding, roofing materials, felt paper, Thermal System Insulation, caulking, mastics, gaskets, woven fabrics, and tape-wrapped hoses.

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 bulk asbestos sampling locations collected during the targeted inspection activities are depicted on ***Figure 5-1a*** through ***Figure 5-1c***. A detailed summary of bulk asbestos sample analytical results collected from the QMCM during the targeted inspection are provided in ***Table 5-1***, *Sample Analytical Summary – Suspect Asbestos Containing Material*. Bulk asbestos sample analytical results are depicted on ***Figure 5-2a*** and ***Figure 5-2b***.

5.1.1.1.2 RPM and Drum Sampling

RPM and open drums with contents that were identified during the reconnaissance activities were sampled as part of the SI and analyzed for the parameters identified in **Section 3.2.1**. RPM and drum sampling locations are depicted on ***Figure 5-1a*** through ***Figure 5-1c***. ***Table 5-2***, *Sample Analytical Summary – Abandoned Container, Residual Process Material, and Waste* provides laboratory analysis results for the collected samples and ***Table 5-3***, *Sample Analytical Summary – Waste Characterization* provides the waste characterization analysis results. RPM and drum sample analytical results are depicted on ***Figure 5-2c*** and ***Figure 5-2d***.

All of the RPM samples contained a number of COCs, predominantly metals, that exceeded applicable regulatory criteria. The QMCM-RPM05 sample of yellow/orange cake-like material from Quincy Stamp Mill No. 2 exceeded hazardous waste characterization limits for lead.

Analytical results indicated that the contents of DM02 exceeded applicable regulatory criteria for certain PNAs and VOCs along with selenium, which was the only compound to exceed criteria in the contents of DM03. Neither drum contained contents that exceeded hazardous waste limits.

5.1.2 Site Investigation

The SI at the QMCM 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 the QMCM. The following subsections present the outcomes of investigative activities completed in the area by summarizing the laboratory analytical results and characterizing their impacts on the environmental media in which they were detected.

5.1.2.1 Terrestrial Investigation

Intrusive investigation activities at the QMCM were generally guided by the findings of historical research and field observations. From a historical standpoint, the area was made up of the Quincy Stamp Mills (inclusive of the Turbine House, Boiler Houses, docks, and other supporting facilities), Quincy Reclamation Plant, Quincy Stamp Sands, and adjacent offshore areas of Torch Lake.

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 properties was available. Previous investigative activities did not fully characterize contaminants in soil and groundwater. The following subsections present a summary of the field observations and analytical results derived from the terrestrial sampling activities.

5.1.2.1.1 Field Observations – Soil and Groundwater

Borings in the QMCM were advanced to depths between 0.5 and 17 feet (ft) below the ground surface (bgs). Boring locations are depicted on ***Figure 5-1a*** through ***Figure 5-1d***. Soil observations documented on field logs indicate that the subsurface at the Quincy Stamp Mills east of M-26 is generally comprised of topsoil or cap material underlain by gray medium grained sands to silty sands (stamp sands), transitioning to reddish brown sands at variable depths between 1 to 6 ft bgs or deeper. In areas without topsoil or a cap cover, surface soils generally range from gray stamp sands to brownish fine to coarse sand with occurrences of organics and gravel.

West of M-26 in the Quincy Stamp Mills, soils are generally comprised of topsoil or fine brown sand underlain by reddish to brown fine to coarse sand to at least 10 ft bgs. The former trestle embankment area is comprised of gray gravely stamp sands. Refusal was encountered in several borings on possible bedrock at depths ranging from 2.5 to 12 ft bgs. Surface soils generally range from reddish to brownish fine to medium sand with occurrences of organics and gravel.

At the Quincy Reclamation Plant, encountered surface soils were generally comprised of cap material or fine to medium gray to brown sand to silty sand underlain by fine to medium brown sand to at least 9 ft bgs. Soils encountered at the Quincy Stamp Sands consisted of cap material overlying gray fine to medium stamp sand.

During groundwater sampling, temporary well points were generally established at 2 ft or 5 ft intervals ranging from 8 ft to 17 ft bgs to the bottom of the screened interval. Saturated soil conditions were generally encountered between depths of 2 ft and 8 ft bgs though some borings did not encounter groundwater at depths up to 12 ft bgs where refusal was encountered. Groundwater quality parameters, including temperature, conductivity, DO, and pH, measured at the time of sample collection were generally considered normal.

5.1.2.1.2 Soil Sampling Results

Terrestrial investigation activities were completed at the QMCM between 16 and 20 May 2017 and on 17 September 2017. During the mobilization a total of 145 soil samples including 13 duplicate soil samples were collected from 93 boring locations. Soil boring locations are depicted on ***Figure 5-1a*** through ***Figure 5-1d***. Investigative methodologies and soil sampling techniques were conducted using the procedures outlined in **Section 3**.

Soil sampling included 54 shallow soil locations, generally from 0 to 6 inches (in.) 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 in **Section 3.2.2** and **Section 3.2.3**. 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 the QMCM contained several COCs at concentrations at or above applicable regulatory criteria. Additionally, historic soil analytical and X-ray fluorescence (XRF) soil screening results for surface and subsurface samples indicated the presence of COCs at concentrations above applicable regulatory criteria.

East of M-26 at the Quincy Stamp Mills, the predominant COCs that exceeded criteria were metals and PNAs which is not unexpected based on historic deposition of stamp sands and slags along with the use of coal. However, some VOCs were also detected along with the PNAs, principally along the north and west sides of the former Coal Shed location, suggestive of releases from historic fuel use or storage.

West of M-26 at the Quincy Stamp Mills, metals predominated the detected COCs that exceeded criteria which again is not unexpected given the uncovered nature of the stamp sands and residuals on the ground surface. On the east end of Quincy Stamp Mill No. 2 PNAs were also detected in the soils at concentrations exceeding criteria, suggestive of releases from historic fuel and/or lubricant use. Cyanide detected in soil samples at the Quincy Stamp Mills does not appear to follow a pattern associated with historic land use or industrial operations.

At the Quincy Reclamation Plant, a smaller percentage of the soil samples contained COCs exceeding criteria than at the Quincy Stamp Mills. As with the stamp mills, metals predominated the criteria exceedances which correlates with the stamp sands and other residuals present in uncapped areas. One sample adjacent to what is believed to be a historic oil house contained the PNA phenanthrene at a concentration exceeding criteria but other adjacent samples did not exceed criteria for any COCs. Similarly, one sample near the historic substation on the north side of the Quincy Reclamation Plant contained PCBs exceeding applicable criteria but surrounding samples did not.

A detailed summary of soil analytical results collected from the QMCM are provided in ***Table 5-4***, *Sample Analytical Summary - Soil*. Previous XRF soil screening results are depicted on ***Figure 5-3a*** through ***Figure 5-3c***. Soil analytical results from QMCM are depicted on ***Figure 5-4a*** through ***Figure 5-4e***. Soil boring logs are included in ***Appendix H***, *Boring Logs* of this SI Report.

5.1.2.1.3 Groundwater Sampling Results

During the installation of soil borings at QMCM, 32 temporary groundwater sampling locations were established to characterize groundwater in the area. The monitoring wells were installed and sampled using the methodologies presented in **Section 3**. The screened intervals in the groundwater sampling locations were established ranging from 8 ft to 17 ft bgs to the bottom of the screened interval. A total of 34 groundwater samples including two duplicate samples were collected. Temporary groundwater sampling locations are depicted on ***Figure 5-1b*** through ***Figure 5-1d***.

Collected groundwater samples were analyzed for the parameters identified in **Section 3.2.4**. 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 PNAs, were detected in the Quincy Reclamation Plant at concentrations above applicable regulatory criteria adjacent to and east of an apparent historic oil house. PCBs were not detected in groundwater at the QMCM 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 the QMCM are provided in ***Table 5-5***, *Sample Analytical Summary - Groundwater*. Groundwater analytical results are depicted on ***Figure 5-5a*** through ***Figure 5-5c***. Soil boring logs are included in ***Appendix H***, *Boring Logs* of this SI Report.

5.1.2.2 Offshore Investigation

Similar to the terrestrial investigation, the offshore investigation activities for the QMCM were also guided by several factors. First, historical analytical data was evaluated to determine if adequate characterization data was available in the study area to assess the overall sediment and surface water quality in the nearshore environment. 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. The offshore investigation included both sediment and surface water sampling from Torch Lake and other water bodies within the QMCM including Quincy Creek and unnamed drainage pathways adjacent to stamp sand deposits and ponds adjacent to Torch Lake associated with the historic operation of the Quincy Reclamation Plant. The following subsections present a summary of the analytical results derived from offshore sampling activities.

5.1.2.2.1 Sediment Sampling Results

Offshore investigation activities were completed at the QMCM between 8 and 9 June 2017. A total of 67 sediment samples including six duplicate sediment samples were collected from 33 sampling locations. Sediment sampling locations are depicted on ***Figure 5-1a*** through ***Figure 5-1e***. Investigative methodologies and sediment sampling techniques were conducted using the procedures outlined in **Section 3**.

All sediment sampling locations included surficial sediment samples, ranging from the sediment surface to between 0.3 and 3 ft in depth. All but five locations included the collection of deeper sediment samples ranging from 0.5 to 5.6 ft in depth. The samples were analyzed for the parameters identified in **Section 3.2.5**.

The analytical results for sediment samples collected during the SI identified multiple inorganic COCs at concentrations that exceeded applicable screening levels across the QMCM. Three PNAs were also detected in sediments at concentrations that exceeded applicable screening levels. The PNA detections were predominantly off-shore from the historic Coal Shed, with one sample that exceeded criteria near Quincy Dredge No. 2. These PNA detections could potentially be related to historic coal and/or lubricant use. Total PCBs were not detected in any of the sediment samples collected from the QMCM.

A detailed summary of sediment analytical results is provided in ***Table 5-6***, *Sample Analytical Summary - Sediment*. Sediment analytical results from the QMCM are depicted on ***Figure 5-6a*** through ***Figure 5-6c***. Sediment core logs are included in ***Appendix I***, *Sediment Core Logs and Surface Water Sampling Records* of this SI Report.

5.1.2.2.2 Surface Water Sampling Results

Concurrent with the offshore sediment investigation activities, surface water samples were collected between 8 and 9 June 2017. A total of nine surface water samples including one duplicate sample were collected from eight sampling locations. Surface water sampling locations are depicted on ***Figure 5-1a*** through ***Figure 5-1e***. Investigative methodologies and surface water sampling techniques were conducted using the procedures outlined in **Section 3**. All samples were analyzed for PCBs and select inorganic constituents.

The analytical results for surface water samples collected during the SI identified copper in all samples and barium or lead in three additional samples at concentrations that exceeded applicable screening levels. Total PCBs were not detected in any of the surface water samples collected from the QMCM area. In addition, one previous Semi-permeable Membrane Device (SPMD) sampling location was located in the QMCM. The SPMD sampling location in the QMCM is depicted on ***Figure 5-1e***, *Sampling Location Map Sediment and Surface Water – Torch Lake*. The general purpose of the collection method is to provide a time-weighted exposure that is representative of chemical uptake through fish respiration. SPMD results do not provide for a direct comparison to surface water criteria, but are an indicator of contaminants in the water column. PCB congeners were not detected in the QMCM SPMD sample; however, they were detected in all other Torch Lake SPMD sample locations.

Water quality parameters, including temperature, conductivity, DO, and pH, measured at the time of sample collection were generally considered normal.

A detailed summary of surface water analytical results is provided in ***Table 5-7***, *Sample Analytical Summary – Surface Water and SPMD*. Analytical results are depicted on ***Figure 5-6a*** through ***Figure 5-6c***. Surface water sampling records are included in ***Appendix I***, *Sediment Core Logs and Surface Water Sampling Records* of this SI Report.

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 laboratory analytical results summarized in the preceding section for the QMCM were reviewed and compared to the following regulatory criteria as applicable for the sampled environmental media:

- MDEQ Cleanup Criteria Requirements for Response Activity;
- EPA ESLs; and,
- Sediment Quality Guidelines, TECs and PECs, MacDonald, et al, 2000.

5.2.1 Comprehensive Exposure Assessment

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

- Risks posed by hazardous substances that are covered or capped with soil and or a vegetative cover.

- Portions of several properties in the QMCM feature capped and vegetated areas along the shoreline of Torch Lake. 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.

- 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 that may result in the volatilization of contaminants to ambient 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 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 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 surface water and sediments that have the potential to have toxic effects on aquatic biota and/or enter the food chain.
- Risks posed by hazardous substances in abandoned containers and RPM.
- Risks posed by hazardous substances inside buildings or former building substrates.

As discussed in **Section 4.2.5**, the MDEQ drinking water/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 MDEQ drinking water/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.

5.2.1.1 Building Materials, Containers, and RPM

During the targeted inspection activities completed at the QMCM, several different ACMs were identified in samples collected from damaged and friable building 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 the QMCM. 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 National Emissions Standard for Hazardous Air Pollutants (NESHAP) standards and MDEQ Particulate Soil Inhalation Criteria (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)	92	28	28	19	9*
COCs exceeding applicable regulatory criteria in one or more sample				Asbestos	

* = Historic sample AS-1 presumed to be non-friable.

Also during the targeted inspection activities completed at the QMCM, two drums and several different RPMs were identified and sampled. The following tables provide an aggregate summary of the sample locations with respect to the total number of samples and how they compare to applicable regulatory criteria. The tables are based solely on the total number of samples, inclusive of historical samples, collected from the QMCM. They list only the number of samples for a specific analytical suite that contained one or more exceedance of a given criterion. Drum and RPM samples were compared to MDEQ's Cleanup Criteria for Response Activity under both Residential and Nonresidential exposure scenarios and characterization for hazardous waste determination.

Containers and RPM Analytical Result Summary Table	Analytical Summary			Cleanup Criteria Requirements for Response Activity – Residential										
				Groundwater Protection		Indoor Air	Ambient Air (Y) (C)				Contact	Csat	Waste
	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	Characteristically Hazardous Waste
Inorganics	11	92	57	NA*	NA*	0	0	0	0	**1**	**6**	0	NA
Cyanide	9	0	0	0	0	0	0	0	0	0	0	0	
VOCs	9	22	2	0	**2**	0	0	0	0	0	0	0	
PNAs	11	65	16	**1**	**2**	0	**1**	**1**	**1**	0	**2**	0	
Total PCBs	9	0	0	0	0	0	0	0	0	0	0	0	
Pesticides	9	0	0	0	0	0	0	0	0	0	0	0	
Herbicides	9	1	0	0	0	0	0	0	0	0	0	0	
TCLP	9	11	1	NA									1
COCs exceeding applicable regulatory criteria in one or more samples				Arsenic, Copper, Lead, 2-Methylnaphthalene, Acenaphthylene, Benzo(a)Anthracene, Benzo(a)Pyrene, Benzo(b)Fluoranthene, Carbazole, Dibenzo(a,h)Anthracene, Dibenzofuran, Fluoranthene, Fluorene, Indeno(1,2,3-cd)Pyrene, Naphthalene, Phenanthrene, and Xylenes									

Containers and RPM Analytical Result Summary Table	Analytical Summary			Cleanup Criteria Requirements for Response Activity – Nonresidential										
				Groundwater Protection		Indoor Air	Ambient Air (Y) (C)				Contact	Csat	Waste
	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	Characteristically Hazardous Waste
Inorganics	11	92	25	NA*	NA*	0	0	0	0	**1**	**4**	0	NA
Cyanide	9	0	0	0	0	0	0	0	0	0	0	0	
VOCs	9	22	0	0	0	0	0	0	0	0	0	0	
PNAs	11	65	9	**1**	**2**	0	**1**	**1**	**1**	0	**1**	0	
Total PCBs	9	0	0	0	0	0	0	0	0	0	0	0	
Pesticides	9	0	0	0	0	0	0	0	0	0	0	0	
Herbicides	9	1	0	0	0	0	0	0	0	0	0	0	
TCLP	9	11	1	NA									1
COCs exceeding applicable regulatory criteria in one or more samples				Copper, Lead, Acenaphthylene, Benzo(a)Anthracene, Benzo(a)Pyrene, Benzo(b)Fluoranthene, Dibenzo(a,h)Anthracene, and Phenanthrene									

5.2.1.2 Soil Exposure Pathway Assessment

Soil analytical results from the QMCM SI included 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 MDEQ's 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 the QMCM. 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) (C)				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	155	1737	55	NA*	NA*	0	0	0	0	0	**45**	0
Cyanide	83	13	10	**9**	0	0	0	0	0	0	0	0
VOCs	121	365	53	**20**	**11**	**1**	0	0	0	0	0	0
PNAs	113	792	148	**33**	**4**	0	**1**	**1**	**1**	0	**19**	0
Asbestos	11	0	0	0	0	0	0	0	0	0	0	0
Total PCBs	90	3	1	0	0	0	0	0	0	0	**1**	0
Pesticides	33	62	0	0	0	0	0	0	0	0	0	0
COCs exceeding applicable regulatory criteria in one or more samples				Arsenic, Copper, Cyanide, 1,2,4-Trimethylbenzene, Benzene, Ethylbenzene, Methylene Chloride, Naphthalene, Xylenes, 2-Methylnaphthalene, Acenapthene, Acenaphthylene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Carbazole, Dibenzo(a,h)anthracene, Dibenzofuran, Fluoranthene, Fluorene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Total PCBs								

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

Soil Analytical Result Summary Table				**Cleanup Criteria Requirements for Response Activity – Nonresidential**								
	Analytical Summary			Groundwater Protection		Indoor Air	Ambient Air (Y) (C)				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	155	1737	11	NA*	NA*	0	0	0	0	0	**10**	0
Cyanide	83	13	10	**9**	0	0	0	0	0	0	0	0
VOCs	121	365	53	**20**	**11**	0	0	0	0	0	0	0
PNAs	113	792	113	**33**	**1**	0	0	0	0	0	**6**	0
Asbestos	11	0	0	0	0	0	0	0	0	0	0	0
Total PCBs	90	3	1	0	0	0	0	0	0	0	**1**	0
Pesticides	33	62	0	0	0	0	0	0	0	0	0	0
COCs exceeding applicable regulatory criteria in one or more samples				Arsenic, Cyanide, Lead, 1,2,4-Trimethylbenzene, Benzene, Ethylbenzene, Methylene Chloride, Naphthalene, Xylenes, 2-Methylnaphthalene, Acenaphthalene, Acenaphthylene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Carbazole, Dibenzo(a,h)anthracene, Dibenzofuran, Fluoranthene, Fluorene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Total PCBs								

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

5.2.1.3 *Groundwater Exposure Pathway Assessment*

Groundwater analytical results from the QMCM included 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 MDEQ's 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	39	309	0	NA*	NA*	NA*	0	0	0	0
Cyanide	9	0	0	0	0	0	0	0	0	0
VOCs	46	40	7	0	0	**5**	0	0	0	0
PNAs	41	34	7	0	0	**5**	0	0	0	0
Total PCBs	23	0	0	0	0	0	0	0	0	0
Pesticides	18	3	1	0	0	**1**	0	0	0	0
COCs exceeding applicable regulatory criteria in one or more sample				1,2,4-Trimethylbenzene, 2-Methylnaphthalene, Naphthalene, Dibenzofuran, Phenanthrene, and gamma-BHC (Lindane).						

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

5.2.1.4 Sediment Exposure Pathway Assessment

Sediment analytical results from the QMCM included 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 QMCM area. 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 5, Resource Conservation and Recovery Act	Consensus Based Sediment Quality Guidelines	
	Total Number of Samples	Detected Analytes	Total Exceedances	Ecological Screening Levels	Threshold Effect Concentration (TEC)	Probable Effect Concentration (PEC)
Inorganics	43	453	144	**43**	**42**	**40**
Cyanide	8	0	0	0	0	0
VOCs	7	0	0	0	0	0
PNAs	41	17	6	**4**	**4**	**1**
Total PCBs	52	0	0	0	0	0
COCs exceeding applicable regulatory criteria in one or more sample				Arsenic, Chromium, Copper, Mercury, Silver, Zinc, Fluoranthene, Phenanthrene, Pyrene		

5.2.1.5 Surface Water Exposure Pathway Assessment

Surface water analytical results from the QMCM included COC concentrations that were at or above concentrations that pose potential risks to water column dwelling species, the food chain, and consequently potentially human health through consumption. The following table provides a summary of the sample locations located in the QMCM area. The table lists only the number of samples for a specific analytical suite that contained one or more exceedance of a given criterion.

Surface Water Analytical Result Summary Table	Analytical Summary			EPA, Region 5, Resource Conservation and Recovery Act	Surface Water – Rule 57		
	Total Number of Samples	Detected Analytes	Total Exceedances	Ecological Screening Levels	Human Non-Cancer Value	Human Cancer Value	Wildlife Value
Inorganics	16	83	22	**16**	**1**	0	0
Cyanide	7	0	0	0	0	0	0
VOCs	7	0	0	0	0	0	0
PNAs	7	2	0	0	0	0	0
Total PCBs	16	0	0	0	0	0	0
Pesticides	7	0	0	0	0	0	0
COCs exceeding applicable regulatory criteria in one or more sample				Barium, Copper, Lead, Zinc			

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 building materials, soil, groundwater, sediment, and surface water in the QMCM. 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 Building Materials, Containers, and RPM Extent of Contamination

Asbestos analytical results for various building materials, including but, not limited to Transite siding, roofing materials, felt paper, Thermal System Insulation, caulking, mastics, gaskets, woven fabrics, and tape-wrapped hoses confirmed that ACM is present in the QMCM area, especially associated with the Quincy Stamp Mills area west of M-26. These materials are predominantly in open areas that are readily accessible to trespassers at the Quincy Stamp Mills and Quincy Reclamation Plant and are subject to migration via wind and water erosion. Asbestos concentrations in 28 different bulk material samples contained asbestos fibers at concentrations greater than 1 %. The damaged and predominantly friable nature of these materials pose a potential risk to human health as it relates to the inhalation pathway. Although asbestos fibers were not detected in a limited number of soil samples collected from the study area, the exposed nature of these material, makes them subject to further degradation that could potentially impact surface soils in the QMCM area.

All of the RPM samples contained a number of COCs, predominantly metals, that exceeded applicable regulatory criteria. The QMCM-RPM04 location on the hillside above Quincy Stamp Mill No. 2 exceeded residential and non-residential Direct Contact Criteria (DCC) for lead while the QMCM-RPM05 sample of yellow/orange cake-like material from Quincy Stamp Mill No. 2 exceeded hazardous waste characterization limits for lead along with DCC for lead and arsenic and a number of exposure criteria for PNAs. At the Quincy Reclamation Plant, RPM exceeded residential and non-residential DCC for lead and a historic waste sample exceeded residential and non-residential PSIC for copper. While not delineated analytically, the RPM was visually identifiable compared to surrounding media and estimated quantities were identified in the summaries in ***Appendix K***, *Abandoned Containers and RPM Summary*.

Analytical results indicated that the contents of DM02 exceeded Groundwater / Surface Water Interface Protection Criteria (GSIPC) for certain PNAs and VOCs along with selenium. Selenium was also the only compound to exceed criteria in the contents of DM03, which exceeded GSIPC. Similar to the RPM, while the limits of the drum contents were not defined analytically, the contents were visually identifiable at the respective drum locations.

The identified risks summarized in the preceding paragraph pose potential threats to human and ecological receptors and are a significant factor when evaluating the extent of contamination.

5.2.2.2 Soil Extent of Contamination

Soil analytical results exceeded GSIPC, Drinking Water Protection Criteria (DWPC), and DCC in residential and non-residential exposure scenarios east of M-26 at the Quincy Stamp Mills portion of QMCM. One previous sample (SS-07) exceeded residential Soil Volatilization to Indoor Air Inhalation Criteria (SVIIC) for benzene in the southwest corner of the former Coal Shed location. Advancement of additional borings as part of the SI delineated the limits of soil exceeding SVIIC in this area. Similarly, additional borings advanced around previous samples SB-07 and MasonB-6 provided delineation of PNAs and lead, respectively, exceeding non-residential DCC, but also identified another area of arsenic exceeding non-residential DCC not far from the historic arsenic removal area. Additional borings advanced around the previous SS-06 location adjacent to Quincy Boiler House No. 1, which contained elevated arsenic concentrations in an uncapped area, did not provide delineation of the limits of arsenic impacts exceeding residential and non-residential DCC.

West of M-26 at the Quincy Stamp Mills, surface soil analytical results exceeded GSIPC and DWPC in the residential and non-residential scenarios as well as residential and non-residential DCC. The predominant contaminants were inorganic compounds, PNAs, and some VOCs, with a few metals exceeding residential DCC at a number of locations and one sample exceeding non-residential DCC for lead. One previous sample, SS-13, exceeded residential Volatile Soil Inhalation Criteria (VSIC) for phenanthrene. The limits of impact at the SS-13 location, while not defined analytically, should be provided by its location on the upper concrete slab foundation of Quincy Stamp Mill No. 2. Similarly, while additional sampling around the previous SS-12 location did not fully define the limits of residential and non-residential DCC exceedances for PNAs, its location on the lower slab level of Quincy Stamp Mill No. 2 should provide definition.

At the Quincy Reclamation Plant, soils exceeded GSIPC, DWPC, and DCC in residential and non-residential scenarios, predominantly for inorganic compounds. The Quincy Reclamation Plant is also the only area in the QMCM where PCBs were detected above MDEQ criteria, with one historic surface soil sample, SS-18, exceeding residential and non-residential DCC. The advancement of additional borings around the SS-18 location at the historic substation north of the Quincy Reclamation Plant delineated the limits of PCB-affected soils and it does not appear to be an upland source of PCBs to Torch Lake. The copper exceedances of residential DCC and the lead exceedances of residential and non-residential DCC were further delineated by additional sampling as part of the SI and should be bounded by the concrete slab foundation of the Quincy Reclamation Plant. The historic detection of arsenic exceeding residential DCC at the Quincy Shore Plant appears to be largely bounded by additional samples collected during the SI.

Historical surface soil screening results also included measured inorganic contaminant concentrations that exceeded DCC and PSIC in both residential and non-residential exposure scenarios at the Quincy Stamp Mills and Quincy Reclamation Plant.

Soils encountered at the Quincy Stamp Sands, beneath the cap, exceeded GSIPC for inorganic compounds and one location exceeded residential and non-residential DWPC for methylene chloride in a historic sample. The author of the historic report that included the subject sample, based on the laboratory data package case narrative, concluded that the methylene chloride, a common lab cleaner and solvent, was detected because of laboratory error and was not representative of actual soil conditions. A sample collected during the SI adjacent to the subject historic location did not verify the presence of methylene chloride, supporting the evidence that the historic detection was laboratory error.

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 50 ft to 1,000 ft of the shoreline of Torch Lake with the exception of some of the interior sampling locations on the Quincy Stamp Sands. Physical hazards were noted during the reconnaissance of the Quincy Stamp Mills and eroded and/or exposed areas of stamp sands were noted in a number of areas along the shoreline.

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 the QMCM, elevated concentrations of inorganic and PNA 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 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 limit determinations related to the extent of contamination in the QMCM. Nevertheless, risks posed to groundwater and surface water are significant and are a factor when evaluating the extent of soil contamination in the QMCM.

5.2.2.3 Groundwater Extent of Contamination

Groundwater analytical results exceeded Drinking Water Criteria (DWC) for both residential and non-residential exposure scenarios, and Groundwater/Surface Water Criteria (GSIC) for inorganic contaminants throughout the investigated areas. PNAs exceeded GSIC at several locations at the Quincy Reclamation Plant associated with an apparent historic oil house, with the dissolved-phase impact appearing to extend to the east toward Torch Lake. The western limits of the dissolved-phase impact were defined but the spatial limits of dissolved-phase impact have not been identified.

No other analyzed constituents were detected above criteria within the QMCM. Groundwater was not encountered at the boring depths west of M-26 so groundwater conditions in that portion of the QMCM could not be determined. The groundwater sampling locations were established in a zone roughly 70 ft to 1,400 ft to the shoreline of Torch Lake at depths of approximately 8 ft to 17 ft bgs.

The potential risks associated with groundwater as a drinking water source as well as it's connectivity to nearby surface water bodies should be a consideration in determinations related to the extent of contamination in the QMCM area.

5.2.2.4 Sediment Extent of Contamination

Sediment analytical results exceeded ESLs, TECs, and PECs for inorganic contaminants across the QMCM. Total PCBs were not detected in any of the sediment samples collected in the QMCM.

Sediment samples from inland waterbodies including drainage channels along the west side of the Quincy Stamp Sands, Quincy Creek, and the ponds associated with the Quincy Reclamation Plant exceeded the ESL, TEC, and PEC for copper, the ESL for silver, and in the case of the ponds the ESL and TEC for mercury at most locations. Similar results were obtained from near-shore sediment samples in Torch Lake near the Quincy Reclamation Plant.

Sediment sampling locations associated with the nearshore sunken dredge (Quincy Dredge No. 2) exceeded the ESL, TEC, and PEC for copper and the ESL for silver. One sediment sampling location near the northeast corner of the dredge also exceeded the ESLs and TECs for mercury and pyrene.

Similar analysis results were received for sediment samples collected around the offshore sunken dredge (Quincy Dredge No. 1). All locations exceeded the ESL, TEC, and PEC for copper and the ESL for silver. Three out of the four locations exceeded the ESL and TEC for mercury, two locations exceeded the ESL and TEC for chromium, and one location contained zinc above the ESL and TEC.

Nearshore sediment sampling locations along the Quincy Stamp Mills generally exceeded the ESL, TEC, and PEC for copper, the ESL and TEC for mercury, and the ESL for silver. At some locations additional metals were also detected. Where PNAs were analyzed, some sediment samples contained select PNAs exceeding ESLs and TECs, predominantly off-shore from the historic Coal Shed but also one location near Quincy Dredge No. 2.

Inorganic COCs are prevalent in the area and the related exceedances, although potentially detrimental to aquatic biota, remain a consistent finding in sediment samples collected from throughout Torch Lake. The absence of detected PCBs in sediment samples from QMCM supports previous data collection and analysis efforts which concluded that "sediment samples historically collected by various agencies, from Torch Lake outside of the conceptual boundaries of this Project's [Calumet and Hecla – Lake Linden, (CHLL)] Operations Area did not contain detections of PCBs. Sediment samples collected from the CHLL contained multiple detections of Total PCBs that exceeded applicable regulatory criteria. Moreover, interpretation of these results clearly demonstrates that there are two distinct groupings of elevated Total PCB concentrations in sediment: The first located offshore in the Lake Linden Recreation Area and the second located offshore in the Hubbell Processing Area. These source areas, as confirmed by the results of the historical SPMD and fish tissue studies, are ongoing sources of PCBs that pose both ecological and potential human health risks and continued degradation of the benthos in Torch Lake." For additional detailed information on the condition of Torch Lake, please refer to the following reports:

- *Distribution of PCBs in the Torch Lake Environment Memorandum*, May 2018, available at https://www.michigan.gov/documents/deq/deq-rrd-amw-AMWPCBMemorandum5-15-18_625028_7.pdf. (MSG 2018).
- *Site Investigation Report for Abandoned Mining Wastes Torch Lake Non-Superfund Site Calumet and Hecla – Lake Linden Operations,* March 2016, available at https://www.michigan.gov/deq/0,4561,7-135-3311_4109_9846_76560-387937--,00.html. (Weston 2016).
- *Site Investigation Report for Abandoned Mining Wastes Torch Lake Non-Superfund Site Calumet and Hecla – Tamarack City Operations*, March 2016, available at https://www.michigan.gov/deq/0,4561,7-135-3311_4109_9846_76560-387280--,00.html. (Weston 2016).

5.2.2.5 Surface Water Extent of Contamination

Surface water analytical results exceeded the copper ESL for all surface water samples collected in the QMCM. Total PCBs were not detected in any of the surface water samples collected in the QMCM. PCB congeners were not detected in the QMCM SPMD sample; however, they were detected in all other Torch Lake SPMD sample locations. VOCs were not detected in the samples where they were analyzed and SVOCs did not exceed a screening level or criteria.

Copper was the only inorganic constituent to exceed ESLs in surface water samples from inland waterbodies including drainage channels along the west side of the Quincy Stamp Sands and Quincy Creek. Copper concentrations in surface water increased from upstream to downstream locations of Quincy Creek.

Water in the ponds associated with the Quincy Reclamation Plant contained copper and barium exceeding the ESL. Water from the wood-lined pits just east of the ponds also contained lead exceeding the ESL and in one case the lead TEC. Water contained in the utility sump in the northwest corner of the Quincy Reclamation Plant contained copper, lead, and zinc in excess of ESLs.

The presence of inorganic COCs is supported by the ubiquitous presence of inorganics in study area groundwater. Similar to the measured COC concentrations in the area sediment samples, COC concentrations in surface water are potentially detrimental to aquatic biota and potentially human health due to its close proximity to the shoreline. The potential risks associated with inorganic constituents, though prevalent in the region, should also be considered when evaluating the extent of surface water contamination in the QMCM. For additional information on Torch Lake surface water conditions, refer to the detailed reports listed in **Section 5.2.2.4** above.

6. CONCLUSIONS AND RECOMMENDATIONS

The analytical results and interpretation summarized in the detailed findings presented in **Section 5** document potential human health and ecological risks that are present in the QMCM. The following subsections provide a synopsis of these findings and a recommended path forward for mitigating the identified risks.

6.1 CONCLUSIONS

Environmental impacts in the QMCM are generally characterized by detections of organic and inorganic contaminants in soil, sediment, and to a lesser extent groundwater and surface 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:

- ACM are ubiquitous in the QMCM and include Transite siding, roofing materials, felt paper, Thermal System Insulation, caulking, mastics, gaskets, woven fabrics, and tape-wrapped hoses. These materials are present in several areas of the QMCM and are subject to migration via wind and water erosion. Asbestos concentrations in 28 bulk material samples contained asbestos fibers at concentrations greater than 1 %. The damaged and friable nature of these materials poses a potential risk to human health as it relates to the inhalation pathway. Although asbestos fibers were not detected in the limited number of soil samples collected from the study area, the exposed nature of these materials makes them subject to further degradation that could potentially impact surface soils in the QMCM.

- All of the RPM samples contained a number of COCs, predominantly metals that exceeded applicable regulatory criteria. The QMCM-RPM04 location on the hillside above Quincy Stamp Mill No. 2 exceeded residential and non-residential DCC for lead while the QMCM-RPM05 sample of yellow/orange cake-like material from Quincy Stamp Mill No. 2 exceeded hazardous waste characterization limits for lead along with DCC for lead and arsenic and a number of exposure criteria for PNAs. At the Quincy Reclamation Plant, RPM exceeded residential and non-residential DCC for lead and a historic waste sample exceeded residential and non-residential PSIC for copper.

- Analytical results indicated that the contents of DM02 exceeded GSIPC for certain PNAs and VOCs along with selenium. Selenium also exceeded GSIPC in the contents of DM03. Neither drum contained contents that exceeded hazardous waste limits.

- The shallow and subsurface soil analytical results for the QMCM SI contained a number of COCs at concentrations at or above applicable regulatory criteria. Soil analytical results exceeded GSIPC, DWPC, and DCC in residential and non-residential exposure scenarios as well as residential SVIIC east of M-26 at the Quincy Stamp Mills portion of QMCM. Similarly, west of M-26 around the Quincy Stamp Mills, soil analytical results exceeded GSIPC and DWPC in the residential and non-residential scenarios as well as residential and non-residential DCC and residential VSIC. The predominant contaminants were inorganic compounds, PNAs, and some VOCs. At the Quincy Reclamation Plant, soils exceeded GSIPC, DWPC, and DCC in residential and non-residential scenarios, predominantly for inorganic compounds. The Quincy Reclamation Plant is also the only area in the QMCM where PCBs were detected above MDEQ criteria, with one historic surface soil sample, SS-18, exceeding residential and non-residential DCC. The advancement of additional borings around the SS-18 location at the historic substation north of the Quincy Reclamation Plant delineated the limits of PCB-affected soils and it does not appear to be an upland source of PCBs to Torch Lake.

Historical surface soil screening results also included measured inorganic contaminant concentrations that exceeded DCC and PSIC in both residential and non-residential exposure scenarios at the Quincy Stamp Mills and Quincy Reclamation Plant. Soils encountered at the Quincy Stamp Sands, beneath the cap, exceeded GSIPC for inorganic compounds.

- Historic surface soil XRF screening results included measured inorganic contaminant concentrations that exceeded DCC and PSIC in both residential and non-residential exposure scenarios.

- Groundwater analytical results exceeded DWC for both residential and non-residential exposure scenarios, and GSIC for inorganic contaminants throughout the investigated areas. PNAs exceeded GSIC at several locations at the Quincy Reclamation Plant associated with an apparent historic oil house, with the dissolved-phase impact appearing to extend to the east toward Torch Lake. The western limits of the dissolved-phase impact were defined but the spatial limits of dissolved-phase impact have not been identified. No other analyzed constituents were detected above criteria within the QMCM. Groundwater was not encountered at the boring terminal depths west of M-26.

- Sediment analytical results exceeded ESLs, TECs, and PECs for inorganic contaminants and PNAs.

- Surface water analytical results exceeded ESLs for inorganic compounds and one sample exceeded the MDEQ Rule 57 Human Drinking Water Non-Cancer Value for lead. PCBs were not detected in any of the surface water samples collected in the QMCM. PCB congeners were not detected in the QMCM SPMD sample; however, they were detected in all other Torch Lake SPMD sample locations.

The analytical results summarized above provide sufficient analytical data and lines of evidence to conclude that the QMCM 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 the QMCM.

QMCM – Media, Criteria, Potential Receptor Summary															
Media	Soil			Groundwater			Air		Sediment	Surface Water		Asbestos, RPM, and Abandoned Containers			
Criteria / Potential Receptor	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
Residential Human	✓	✓	✓	✓	✓		✓				✓	✓		✓	✓
Nonresidential Human	✓	✓	✓	✓	✓							✓		✓	✓
Water Column Organism										✓					
Benthic Organism									✓						
COCs exceeding applicable regulatory criteria in one or more sample				Arsenic, Barium, Chromium, Copper, Lead, Mercury, Silver, Zinc, Cyanide, 1,2,4-Trimethylbenzene, Benzene, Ethylbenzene, Methylene Chloride, Naphthalene, Xylenes, 2-Methylnaphthalene, Acenapthene, Acenaphthylene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Carbazole, Dibenzo(a,h)anthracene, Dibenzofuran, Fluoranthene, Fluorene, Indeno(1,2,3-cd)pyrene, Phenanthrene, Pyrene, Total PCBs											

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 QMCM with respect to the goals and objectives for the Project:

- Significant in-lake sources of contamination are present in the form of inorganic COCs and some PNAs in the study area;

- Significant terrestrial sources of contamination are present in the form of inorganic COCs, cyanide, PNAs, VOCs, and asbestos in the study area;

- No in-lake or terrestrial uncharacterized waste deposits were identified in the study area;

- Industrial ruins, including buildings, foundations, and building floors associated with the mill ruins are present. Voids noted where it appears soil has settled into the subsurface near the mill ruins pose a potential physical hazard due to slip, trip, and fall concerns. Significant areas of mining era ACM in building debris were observed in the study area; and,

- The uncapped portion of QMCM west of Highway M-26 has not been improved since the mining era and features widespread disposition of tailings and stamp sand within and proximal to the stamp mill ruins and widespread debris. Items of concern include abandoned containers some of which are rusting carcasses, some containing solidified or granular waste, and ubiquitous ACM that are distributed across the properties. Further, these abandoned containers and ACM are exposed to weathering and potential migration via storm water runoff and wind dispersion. Access to the property west of M-26 is unrestricted and is frequented by recreational users.

Although PCBs were not detected in sediment samples collected from the QMCM, sediment samples collected from locations in Torch Lake outside of the conceptual boundaries of the QMCM did contain detections of PCBs. The majority of these PCB detections were in sediment samples that were collected from the shallow or surface interval of sediment. Although not specific to the QMCM, these sample analytical results provide a broad view of sediment quality, as it relates to PCB contamination, across Torch Lake.

The historical Torch Lake sediment samples combined with the QMCM sediment sample results provide a profile of PCB contaminant distribution within the sediments of Torch Lake. Although PCBs were not detected in the QMCM, the interpreted results clearly show two distinct groupings of Total PCB concentrations in the CHLL portion of Torch Lake that exceed applicable regulatory criteria: The first grouping is located offshore in the Lake Linden Recreation Area and the second is located offshore in the Hubbell Processing Area.

6.2 RECOMMENDATIONS

The conclusions outlined in the preceding subsection establish that parcels within QMCM are Facilities. The following is an outline of a recommended path forward for managing the identified potential exposure risks in the QMCM and Torch Lake.

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.

Various actions have been taken through the implementation of remedial measures, such as the placement of a soil and vegetative cap on bulk waste deposits (the stamp sands east of M-26), to address these environmental issues. In addition to the above remedial activities implemented as part of the Torch Lake Superfund Site, the EPA ERB also conducted a removal action to mitigate potential public health risks related to exposed stamp sands that contained elevated arsenic concentrations and drums that contained residual waste. Based on the presence of waste materials and the frequent trespass access to the QMCM, the MDEQ sought EPA ERB assistance in 2017 with addressing the threats related to abandoned containers, RPM, and ACBM.

The performance of a risk assessment on select properties or groups of properties, based on current and anticipated future land-use will help identify remedial goals for properties where potential human health and ecological hazards have been identified. 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, should 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 Torch Lake or terrestrial areas previously addressed by EPA in light of the additional information provided by the Project.

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.

In addition to the overarching recommendations presented above, the following provides additional considerations specific to areas of the QMCM that have not been previously addressed by EPA and MDEQ SFS:

- Given current land use considerations, the uncontrolled nature of the identified ACM merits immediate response actions to control potential exposure to contaminants. Once these uncontrolled conditions have been stabilized and exposure risks have been evaluated, long-term remedial objectives can be evaluated. To ensure compliance with regulatory statutes, human health and ecological risks should minimally be qualitatively evaluated with parcel-specific data to determine if risks to the public health, safety, or welfare or to the environment are likely.

- To date, no documented remedial actions are known to have been completed in the QMCM other than capping of the stamp sands, removal of a cache of drums from the former dump area, and removal of an area of arsenic-contaminated stamp sands, all of which occurred east of M-26. No remedial actions are known to have occurred west of M-26. The identified contaminants and their uncontrolled nature, including numerous uncharacterized abandoned containers, merit immediate response actions to control and prevent continued human and ecological interaction and migration of contaminants from the terrestrial portions of the study area. Once these uncontrolled conditions have been stabilized and exposure risks have been evaluated, long-term remedial objectives can be evaluated.

- MDEQ should continue to coordinate with EPA ERB on the EPA assessment and removal activities.

- MDEQ should continue assessment and delineation of affected areas as needed to support risk assessment and remediation/removal planning and implementation.

Identified terrestrial and in-lake contamination in the QMCM and Torch Lake may require that additional steps be taken to remove, reduce or treat the contamination to concentrations that are below applicable cleanup standards. Of these contaminants, PCBs, although not detected in samples from the QMCM, present a unique hazard in Torch Lake due to their chemical properties that allow the chemical to migrate and bioaccumulate, such as in fish tissue where concentrations of the contaminant can exceed measured concentrations in environmental samples. Although measures such as BUIs, including "Restrictions on fish and wildlife consumption" and "Degradation of benthos" are in place, risks to human health are significant due to the presence of PCBs in the food chain in terrestrial areas, and on-going potential for upland sources of PCBs to enter Torch Lake, outside of QMCM.

MDEQ should continue to provide new study data to the RRD SFS which is responsible for monitoring EPA's remedy for the terrestrial and 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. 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 EPA's selected remedy is performing as designed and those institutional controls, where required, have been recorded and are being enforced.

Additionally, MDEQ should continue information sharing and resolution efforts with all property owners and other stakeholders including providing pertinent data to Osceola Township and to the Michigan Department of Health and Human Services (MDHHS) and Western Upper Peninsula Health Department (WUPHD) where evaluation of specific potential public health risks is warranted.

7. REFERENCES

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FIGURES

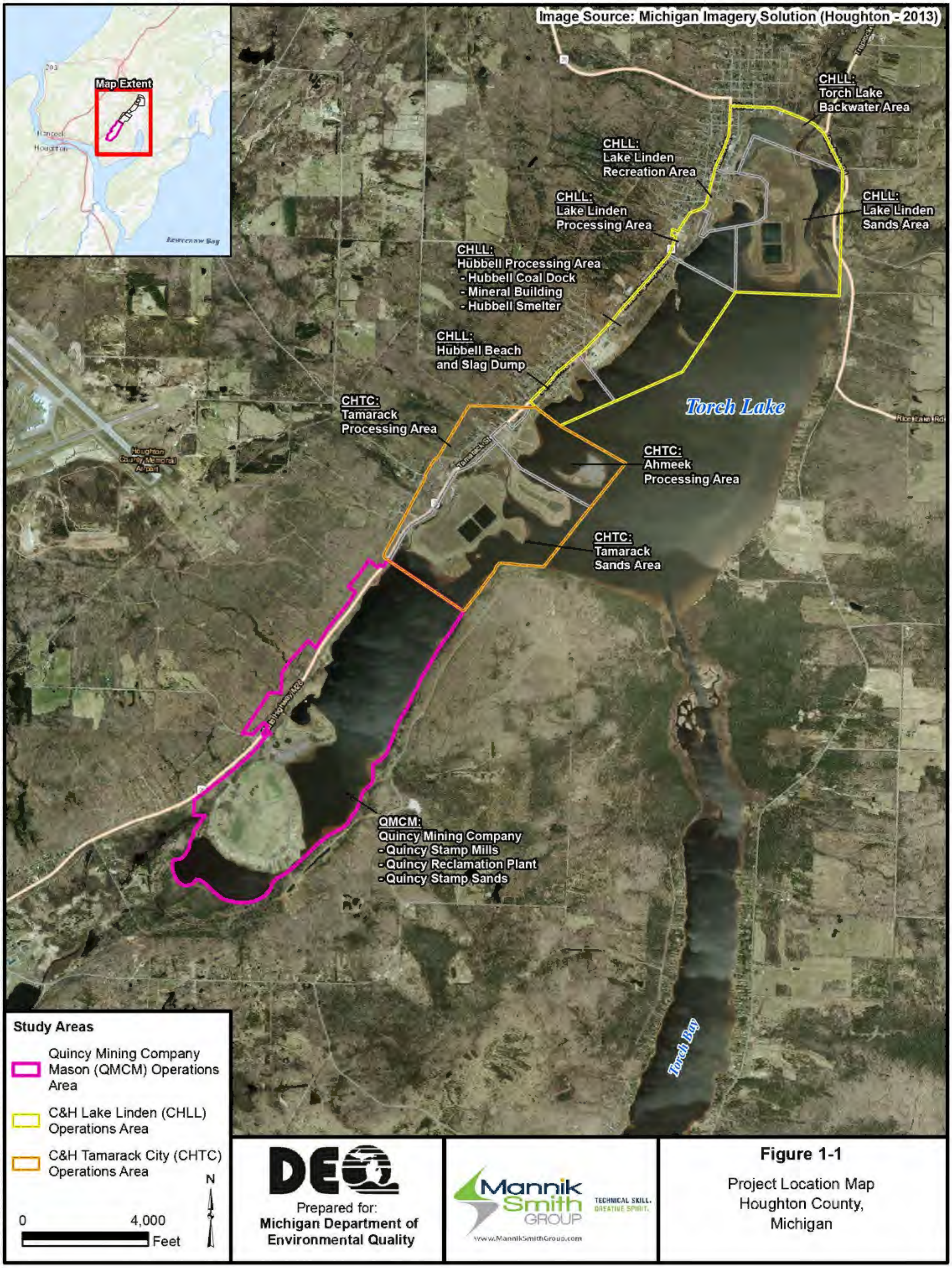

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Figure 1-1

Project Location Map
Houghton County, Michigan

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Figure 1-2
Quincy Mining Company Mason Operations Area
Area Features Map
Mason, Houghton County, Michigan

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Cap Boundary (2005 NRCS)

Mining Era Buildings and Structures

QMCM Study Area Boundary

N

0 225 Ft

Coordinate System: MIGeoRef(m)

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Figure 2-1

Location and Features Map
(Quincy Stamp Mills)
Quincy Mining Company Mason Operations Area
Mason, Houghton County, Michigan

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Cap Boundary (2005 NRCS)
Mining Era Buildings and Structures
QMCM Study Area Boundary

N
0 250 Ft
Coordinate System: MIGeoRef(m)

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Figure 2-2
Location and Features Map
(Quincy Reclamation Plant)
Quincy Mining Company Mason Operations Area
Mason, Houghton County, Michigan

Cap Boundary (2005 NRCS)

Mining Era Buildings and Structures

QMCM Study Area Boundary

N

0 500 Ft

Coordinate System: MIGeoRef(m)

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Figure 2-3

Location and Features Map
(Quincy Stamp Sands)
Quincy Mining Company Mason Operations Area
Mason, Houghton County, Michigan

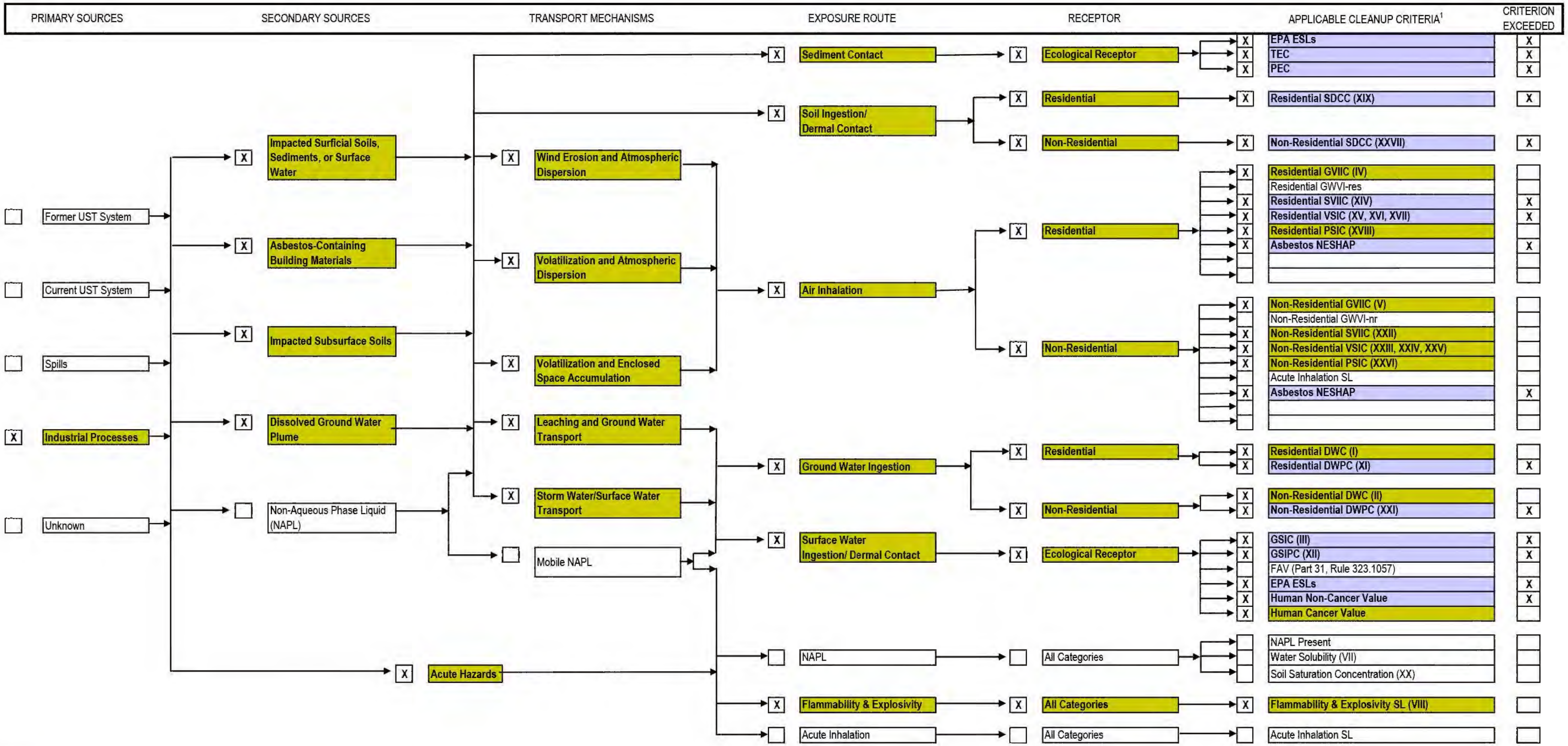
FILE: W:\Projects\Projects K-O\MDEQ0076\ENGAPPS\GIS\mxds\2019_QMCM_St\Fig2-3_QMCM_QSS_Features_v20180504_Final.mxd 1:33:54 PM 1/17/2019 KBrown

FIGURE 4-1

Conceptual Site Model - Exposure Pathway Evaluation

Quincy Mining Company Mason Operations Area

Abandoned Mining Wastes - Torch Lake Non-Superfund Site



Notes:

X	Indicates this portion of exposure pathway is present at QMCM.
X	Indicates this criterion is exceeded at QMCM.

[1] DEQ-RD Op Memo 1 (updated December 30, 2013), unless otherwise noted

Roman numerals indicate DEQ criterion number

[2] Classification (Adapted from DEQ 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 demonstratable 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.

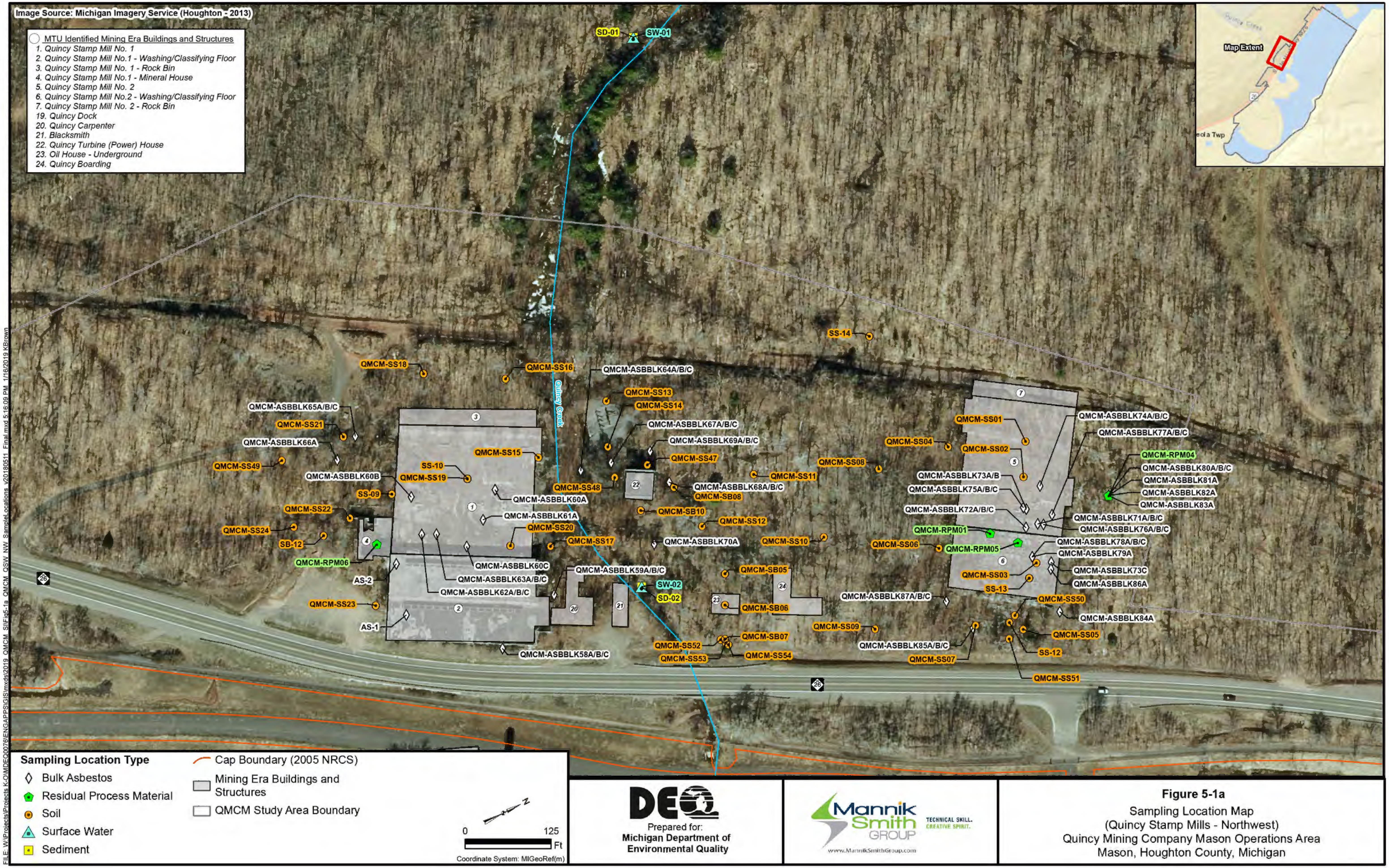


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Figure 5-1a

Sampling Location Map
(Quincy Stamp Mills - Northwest)
Quincy Mining Company Mason Operations Area
Mason, Houghton County, Michigan

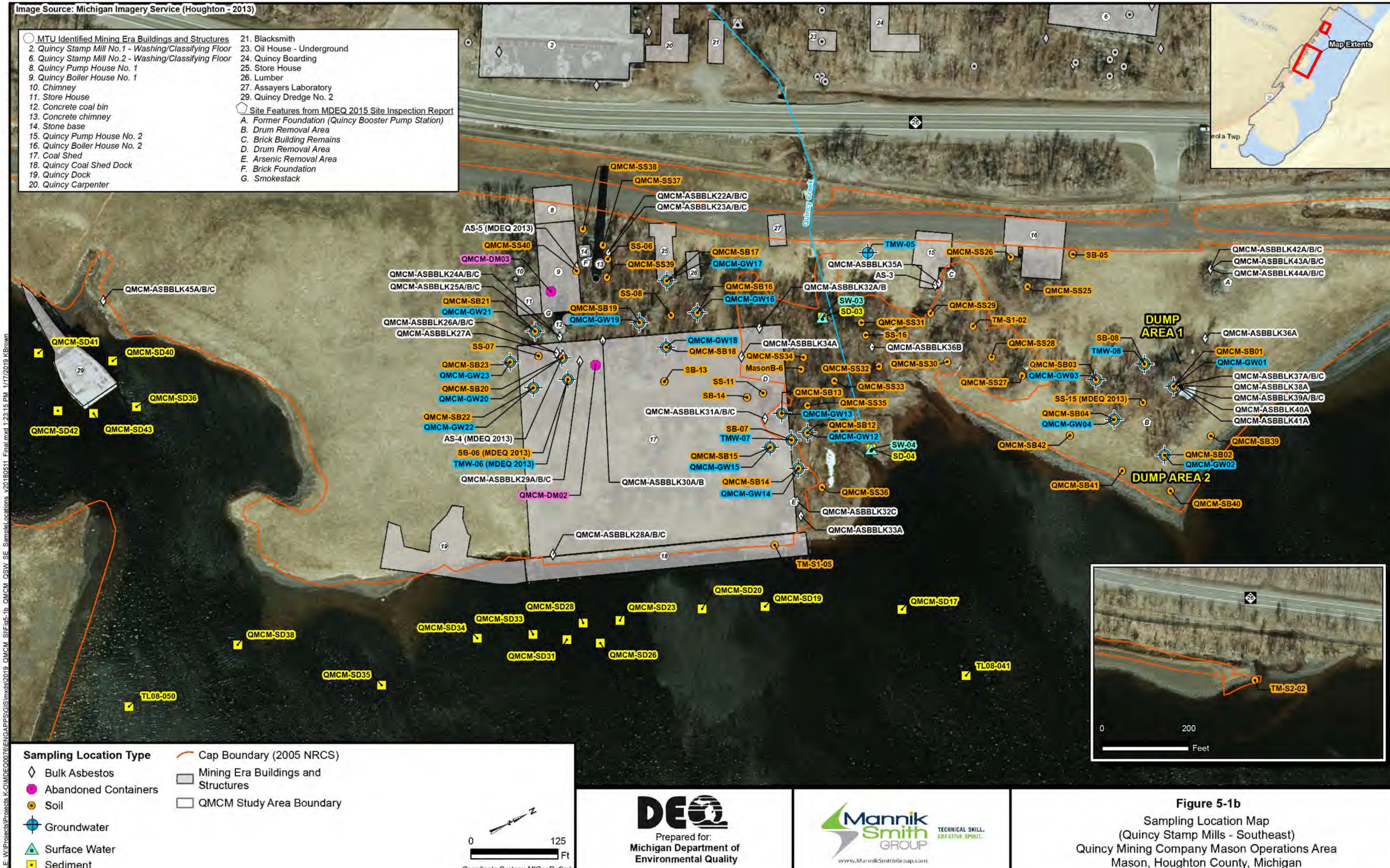

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Figure 5-1b

Sampling Location Map
(Quincy Stamp Mills - Southeast)
Quincy Mining Company Mason Operations Area
Mason, Houghton County, Michigan

Sampling Location Type

- Bulk Asbestos
- Residual Process Material
- Soil
- Groundwater
- Surface Water
- Semi-Permeable Membrane Device
- Sediment
- Waste
- Cap Boundary (2005 NRCS)
- Mining Era Buildings and Structures
- QMCM Study Area Boundary

N

0 200 Ft

Coordinate System: MIGeoRef(m)

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Figure 5-1c

Sampling Location Map
(Quincy Reclamation Plant)
Quincy Mining Company Mason Operations Area
Mason, Houghton County, Michigan

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Figure 5-1d
Sampling Location Map
(Quincy Stamp Sands)
Quincy Mining Company Mason Operations Area
Mason, Houghton County, Michigan

Sampling Location Type

- Surface Water
- Semi-Permeable Membrane Device
- Sediment

- Cap Boundary (2005 NRCS)
- QMCM Study Area Boundary
- Mining Era Buildings and Structures

N

0 1,000 Ft

Coordinate System: MIGeoRef(m)

DEQ

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Figure 5-1e
Sampling Location Map
Sediment and Surface Water - Torch Lake
Quincy Mining Company Mason Operations Area
Mason, Houghton County, Michigan

FILE: W:\Projects\Projects K-O\MDEQ0076\ENG\APPS\GIS\mxds\2019_QMCM_SI\Fig5-1e_QMCM_TorchLake_SampleLocations_v20180511_Final.mxd 1:38:32 PM 1/17/2019 KBrown

Sample with Asbestos Greater than 1%

Presumed Asbestos Containing Material based on associated sample result or field observations

Sample with Asbestos Less than 1%

Sample with Asbestos Not Detected

Cap Boundary (2005 NRCS)

Mining Era Buildings and Structures

Notes:
- Evaluation based on MDEQ Criteria at time of Project completion
- Asbestos Containing Material (ACM) are materials containing greater than 1% asbestos, as defined and regulated by the EPA per 40 CFR Part 61, Subpart M and MIOSHA/OHSA 29 CFR 1926.1101
- TSI = Thermal System Insulation

N

0 275 Ft

Coordinate System: MIGeoRef(m)

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Figure 5-2a
Sample Analytical Result Map - Suspect Asbestos Containing Material (Quincy Stamp Mills)
Quincy Mining Company Mason Operations Area
Mason, Houghton County, Michigan

FILE: W:\Projects\Projects K-O\MDEQ0007\ENGAPPS\GIS\mxds\2019_QMCM_SI\Fig5-2a_ASBBLK_QSM_v20180511_Final.mxd 3:48:58 PM 1/16/2019 KBrown

Sample with Asbestos Greater than 1%

Presumed Asbestos Containing Material based on associated sample result or field observations

Sample with Asbestos Not Detected

Cap Boundary (2005 NRCS)

Mining Era Buildings and Structures

Notes:
- Evaluation based on MDEQ Criteria at time of Project completion
- Asbestos Containing Material (ACM) are materials containing greater than 1% asbestos, as defined and regulated by the EPA per 40 CFR Part 61, Subpart M and MIOSHA/OSHA 29 CFR 1926.1101
- TSI = Thermal System Insulation

N 0 250 Ft

Coordinate System: MIGeoRef(m)

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Figure 5-2b
Sample Analytical Result Map - Suspect Asbestos Containing Material (Quincy Reclamation Plant and Quincy Stamp Sands)
Quincy Mining Company Mason Operations Area
Mason, Houghton County, Michigan

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MTU Identified Mining Era Buildings and Structures

1. Quincy Stamp Mill No. 1
2. Quincy Stamp Mill No.1 - Washing/Classifying Floor
3. Quincy Stamp Mill No. 1 - Rock Bin
4. Quincy Stamp Mill No.1 - Mineral House
5. Quincy Stamp Mill No. 2
6. Quincy Stamp Mill No.2 - Washing/Classifying Floor
7. Quincy Stamp Mill No. 2 - Rock Bin
8. Quincy Pump House No. 1
9. Quincy Boiler House No. 1
10. Chimney
11. Store House
12. Concrete coal bin
13. Concrete chimney
14. Stone base
15. Quincy Pump House No. 2
16. Quincy Boiler House No. 2
17. Coal Shed
18. Quincy Coal Shed Dock
19. Quincy Dock
20. Quincy Carpenter
21. Blacksmith
22. Quincy Turbine (Power) House
23. Oil House - Underground
24. Quincy Boarding
25. Store House
26. Lumber
27. Assayers Laboratory

Site Features from MDEQ 2015 Site Inspection Report

A. Former Foundation (Quincy Booster Pump Station)
B. Drum Removal Area
C. Brick Building Remains
D. Drum Removal Area
E. Arsenic Removal Area
F. Brick Foundation
G. Smokestack

MDEQ Part 201 Cleanup Criteria for Response Action

[1]=Statewide Default Background Level
[2]*=Groundwater Surface Water Interface Protection Criteria
[3]=Soil Saturation Concentration Screening Levels
[4]*=Residential Drinking Water Protection Criteria
[5]=Residential Soil Volatilization to Indoor Air Inhalation Criteria (VSIC)
[6]=Residential Infinite Source Volatile Soil Inhalation Criteria
[7]=Residential Finite VSIC for 5 Meter Source Thickness
[8]=Residential Finite VSIC for 2 Meter Source Thickness
[9]=Residential Particulate Soil Inhalation Criteria
[10]=Residential Direct Contact Criteria
[11]*=Nonresidential Drinking Water Protection Criteria
[12]=Nonresidential Soil Volatilization to Indoor Air Inhalation
[13]=Nonresidential Infinite Source Volatile Soil Inhalation Criteria
[14]=Nonresidential Finite VSIC for 5 Meter Source Thickness
[15]=Nonresidential Finite VSIC for 2 Meter Source Thickness
[16]=Nonresidential Particulate Soil Inhalation Criteria
[17]=Nonresidential Direct Contact Criteria
* Exceedances of criteria 2, 4, and 11 shown for organics and cyanide only
Evaluation based on MDEQ Criteria at time of Project completion

RPM Sample with Results Greater than Criteria
RPM Sample with Results Less than Criteria
Abandoned Container Sample with Results Greater than Criteria
Abandoned Container Sample with all Results Less than Criteria
Abandoned Container Not Sampled
Cap Boundary (2005 NRCS)
Mining Era Buildings and Structures

Notes:
- Evaluation based on MDEQ Criteria at time of Project completion.
- RPM = Residual Process Material
- mg/kg = milligrams per kilogram
- ug/kg = micrograms per kilogram
- Sample depths shown in feet below ground surface (bgs).
- TCLP = Toxicity Characteristic Leach Procedure
- RED text indicates TCLP Result

N
0 275 Ft
Coordinate System: MIGeoRef(m)

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Figure 5-2c
Sample Analytical Result Map - Residual Process Material, Abandoned Container, and Waste
(Quincy Stamp Mills)
Quincy Mining Company Mason Operations Area
Mason, Houghton County, Michigan

FILE: W:\Projects\Projects K-O\MDEQ0076\ENGAPPS\GIS\mxds\2019_QMCM_SI\Fig5-2c_RPM_Waste_Containers_QSM_v20180604_Final.mxd 3:52:57 PM 1/16/2019 KBrown

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- RPM Sample with Results Greater than Criteria
- RPM Sample with Results Less than Criteria
- Waste Sample with Results Greater than Criteria
- Waste Sample with Results Less than Criteria
- Abandoned Container Not Sampled
- Cap Boundary (2005 NRCS)
- Mining Era Buildings and Structures

Notes:
- Evaluation based on MDEQ Criteria at time of Project completion.
- RPM = Residual Process Material
- mg/kg = milligrams per kilogram
- ug/kg = micrograms per kilogram
- Sample depths shown in feet below ground surface (bgs).

N

0 250 Ft

Coordinate System: MIGeoRef(m)

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Figure 5-2d
Sample Analytical Result Map - Residual Process Material, Abandoned Container, and Waste
(Quincy Reclamation Plant and Quincy Stamp Sands)
Quincy Mining Company Mason Operations Area
Mason, Houghton County, Michigan

Locations Screened for Metals - At least one exceedance of:

- Residential Direct Contact Criteria
- Residential Particulate Soil Inhalation Criteria
- Non Residential Direct Contact Criteria
- Non Residential Particulate Soil Inhalation Criteria
- Screening locations with no exceedances
- Cap Boundary (2005 NRCS)
- Mining Era Buildings and Structures
- QMCM Study Area Boundary

Notes:
- *Xray Fluorescence screening results are from surface soils unless otherwise specified*
- *All locations labeled XRF-## are from 2013 all others are from 2007.*

N

0 200 Ft

Coordinate System: MIGeoRef(m)

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Figure 5-3a

Soil Screening Results Map - Soil
(Quincy Stamp Mills)
Quincy Mining Company Mason Operations Area
Mason, Houghton County, Michigan

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MTU Identified Mining Era Buildings and Structures

29. Quincy Dredge No. 2
30. Quincy Regrinding Plant
31. Substation
32. Transport
33. Quincy Shore Plant

Site Features from MDEQ 2015 Site Inspection Report

H. Former Water Intake
I. Old Transformer Pad
J. Hydrant

Locations Screened for Metals - At least one exceedance of:

- Residential Direct Contact Criteria
- Residential Particulate Soil Inhalation Criteria
- Non Residential Direct Contact Criteria
- Non Residential Particulate Soil Inhalation Criteria
- Screening locations with no exceedances
- Cap Boundary (2005 NRCS)
- Mining Era Buildings and Structures
- QMCM Study Area Boundary

Notes:
- Xray Fluorescence screening results are from surface soils unless otherwise specified
- All locations labeled XRF-## are from 2013 all others are from 2007.

N
0 250 Ft
Coordinate System: MIGeoRef(m)

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Figure 5-3b

Soil Screening Results Map - Soil
(Quincy Reclamation Plant)
Quincy Mining Company Mason Operations Area
Mason, Houghton County, Michigan

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Locations Screened for Metals - At least one exceedance of:

- Residential Direct Contact Criteria
- Residential Particulate Soil Inhalation Criteria
- Non Residential Direct Contact Criteria
- Non Residential Particulate Soil Inhalation Criteria
- Screening locations with no exceedances
- Cap Boundary (2005 NRCS)
- Mining Era Buildings and Structures
- QMCM Study Area Boundary

Notes:
- Xray Fluorescence screening results are from surface soils unless otherwise specified
- All locations labeled XRF-## are from 2013 all others are from 2007.

N
0 500 Ft
Coordinate System: MIGeoRef(m)

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Figure 5-3c
Soil Screening Results Map - Soil (Quincy Stamp Sands)
Quincy Mining Company Mason Operations Area
Mason, Houghton County, Michigan

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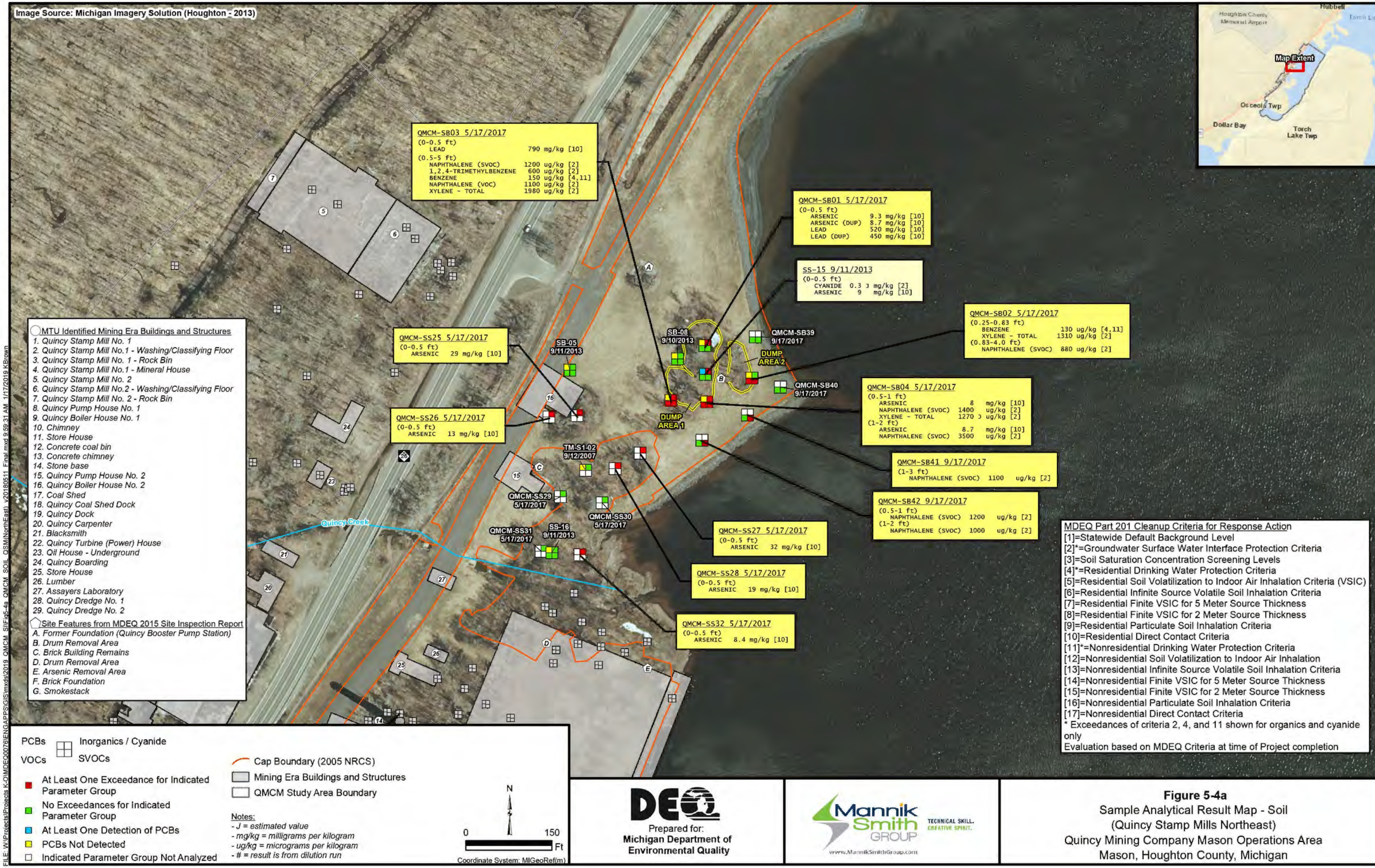

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Figure 5-4a
Sample Analytical Result Map - Soil
(Quincy Stamp Mills Northeast)
Quincy Mining Company Mason Operations Area
Mason, Houghton County, Michigan

FILE: W:\Projects\Projects K-O\MDEQ0076\ENGAPPS\GIS\mxds\2019_QMCM_SI\Fig5-4a_QMCM_SOIL_QSM(NorthEast)_v20180511_Final.mxd 9:59:31 AM 1/17/2019 KBrown

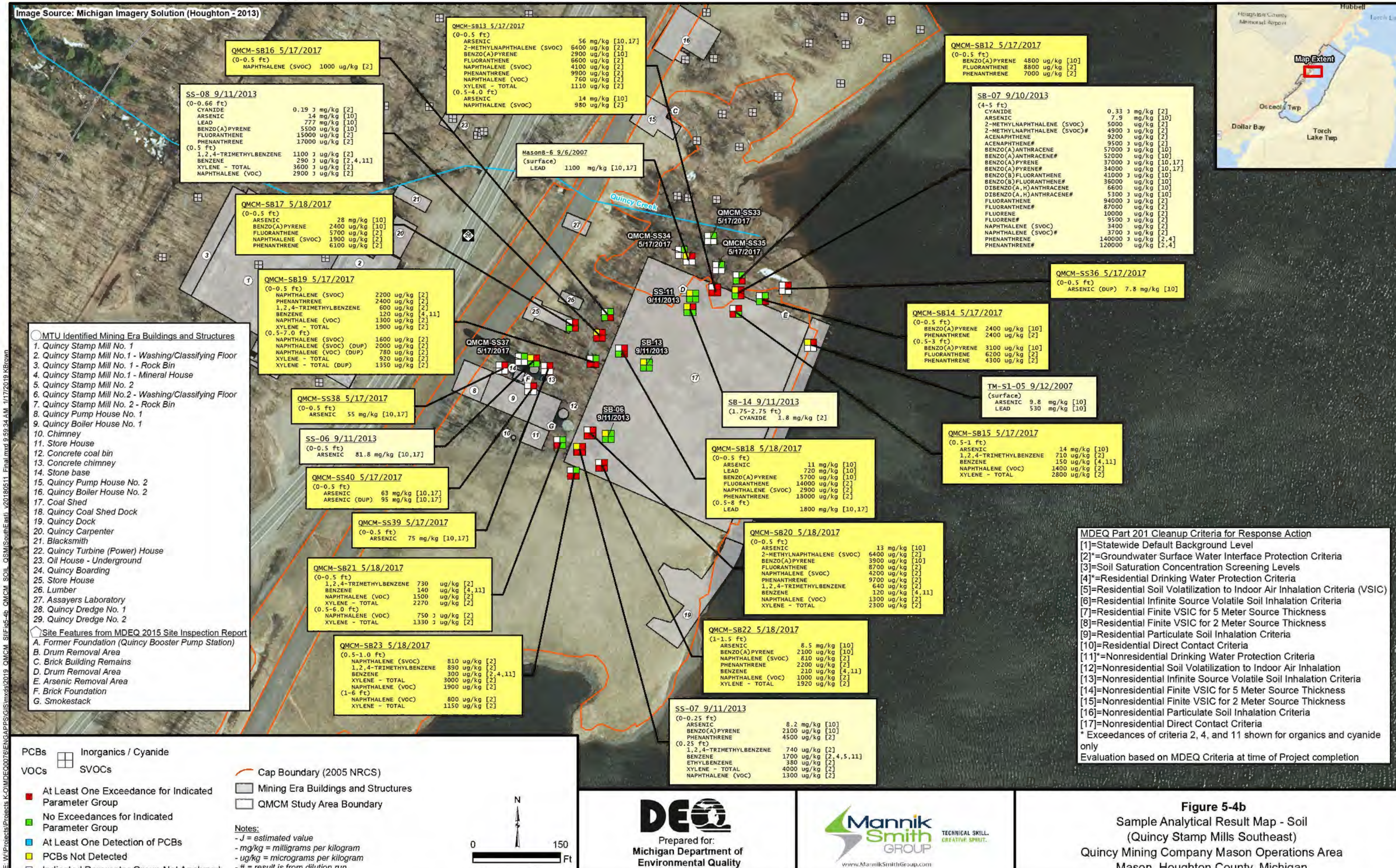

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Figure 5-4b
Sample Analytical Result Map - Soil
(Quincy Stamp Mills Southeast)
Quincy Mining Company Mason Operations Area
Mason, Houghton County, Michigan

FILE: W:\Projects\Projects K-O\MDEQ0076\ENGAPPS\GIS\mxds\2019_QMCM_SI\Fig5-4b_QMCM_SOIL_QSM(SouthEast)_v20180511_Final.mxd 9:59:34 AM 1/17/2019 KBrown

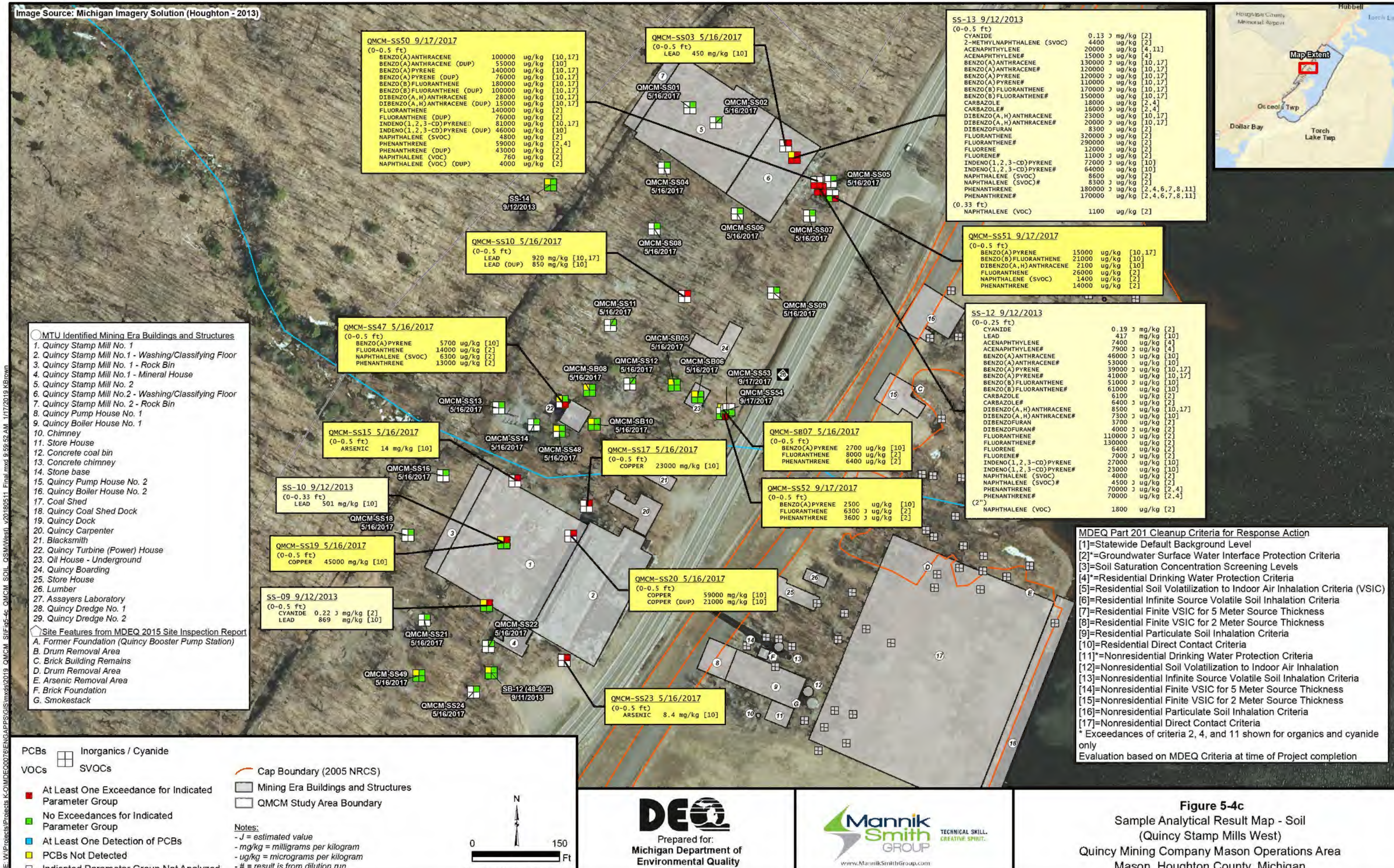

Figure 5-4c
Sample Analytical Result Map - Soil
(Quincy Stamp Mills West)
Quincy Mining Company Mason Operations Area
Mason, Houghton County, Michigan

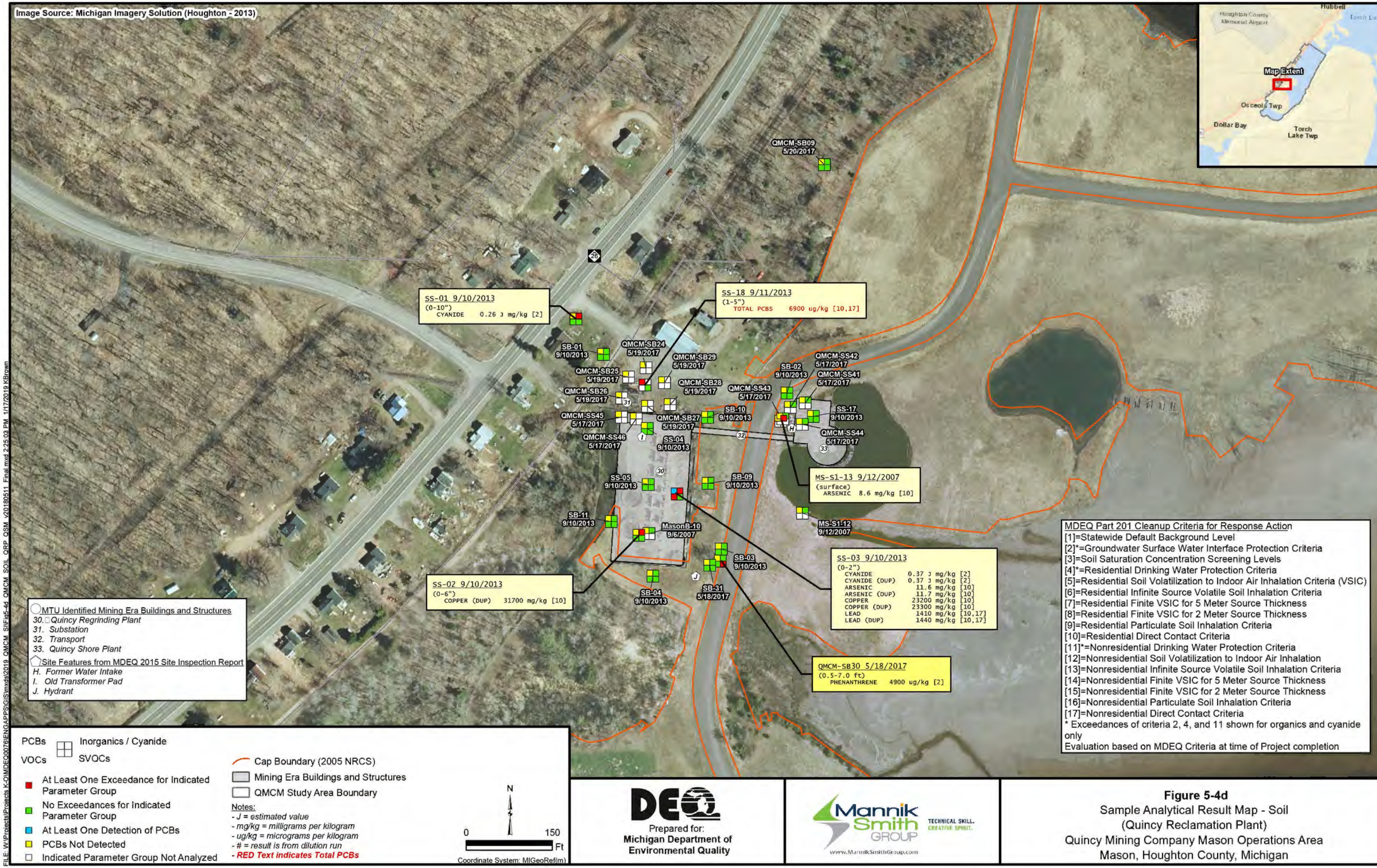

Image Source: Michigan Imagery Solution (Houghton - 2013)
Houghton County Memorial Airport
Hubbell
Torch Lake
Map Extent
Osceola Twp
Dollar Bay
Torch Lake Twp
QMCM-SB09 5/20/2017
SS-01 9/10/2013 (0-10") CYANIDE 0.26 J mg/kg [2]
SS-18 9/11/2013 (1-5") TOTAL PCBS 6900 ug/kg [10,17]
SB-01 9/10/2013
QMCM-SB24 5/19/2017
QMCM-SB29 5/19/2017
QMCM-SB25 5/19/2017
QMCM-SB28 5/19/2017
QMCM-SB26 5/19/2017
QMCM-SS45 5/17/2017
QMCM-SB27 5/19/2017
QMCM-SS46 5/17/2017
SS-04 9/10/2013
SB-10 9/10/2013
QMCM-SS43 5/17/2017
SB-02 9/10/2013
QMCM-SS42 5/17/2017
QMCM-SS41 5/17/2017
SS-17 9/10/2013
QMCM-SS44 5/17/2017
MS-S1-13 9/12/2007 (surface) ARSENIC 8.6 mg/kg [10]
SS-05 9/10/2013
SB-09 9/10/2013
SB-11 9/10/2013
MasonB-10 9/6/2007
MS-S1-12 9/12/2007
SB-03 9/10/2013
SS-03 9/10/2013 (0-2") CYANIDE 0.37 J mg/kg [2] CYANIDE (DUP) 0.37 J mg/kg [2] ARSENIC 11.6 mg/kg [10] ARSENIC (DUP) 11.7 mg/kg [10] COPPER 23200 mg/kg [10] COPPER (DUP) 23300 mg/kg [10] LEAD 1410 mg/kg [10,17] LEAD (DUP) 1440 mg/kg [10,17]
SS-02 9/10/2013 (0-6") COPPER (DUP) 31700 mg/kg [10]
SB-04 9/10/2013
SB-31 5/18/2017
QMCM-SB30 5/18/2017 (0.5-7.0 ft) PHENANTHRENE 4900 ug/kg [2]
MTU Identified Mining Era Buildings and Structures
30. Quincy Regrinding Plant
31. Substation
32. Transport
33. Quincy Shore Plant
Site Features from MDEQ 2015 Site Inspection Report
H. Former Water Intake
I. Old Transformer Pad
J. Hydrant
MDEQ Part 201 Cleanup Criteria for Response Action
[1]=Statewide Default Background Level
[2]*=Groundwater Surface Water Interface Protection Criteria
[3]=Soil Saturation Concentration Screening Levels
[4]*=Residential Drinking Water Protection Criteria
[5]=Residential Soil Volatilization to Indoor Air Inhalation Criteria (VSIC)
[6]=Residential Infinite Source Volatile Soil Inhalation Criteria
[7]=Residential Finite VSIC for 5 Meter Source Thickness
[8]=Residential Finite VSIC for 2 Meter Source Thickness
[9]=Residential Particulate Soil Inhalation Criteria
[10]=Residential Direct Contact Criteria
[11]*=Nonresidential Drinking Water Protection Criteria
[12]=Nonresidential Soil Volatilization to Indoor Air Inhalation
[13]=Nonresidential Infinite Source Volatile Soil Inhalation Criteria
[14]=Nonresidential Finite VSIC for 5 Meter Source Thickness
[15]=Nonresidential Finite VSIC for 2 Meter Source Thickness
[16]=Nonresidential Particulate Soil Inhalation Criteria
[17]=Nonresidential Direct Contact Criteria
* Exceedances of criteria 2, 4, and 11 shown for organics and cyanide only
Evaluation based on MDEQ Criteria at time of Project completion
PCBs
VOCs
Inorganics / Cyanide
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
Cap Boundary (2005 NRCS)
Mining Era Buildings and Structures
QMCM Study Area Boundary
Notes:
- J = estimated value
- mg/kg = milligrams per kilogram
- ug/kg = micrograms per kilogram
- # = result is from dilution run
- RED Text indicates Total PCBs
N
0
150
Ft
Coordinate System: MIGeoRef(m)
DEQ
Prepared for:
Michigan Department of Environmental Quality
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Figure 5-4d
Sample Analytical Result Map - Soil
(Quincy Reclamation Plant)
Quincy Mining Company Mason Operations Area
Mason, Houghton County, Michigan
FILE: W:\Projects\Projects K-O\MDEQ0076\ENGAPPS\GIS\mxds\2019_QMCM_SI\Fig5-4d_QMCM_SOIL_QRP_QSM_v20180511_Final.mxd 2:25:03 PM 1/17/2019 KBrown

FILE: W:\Projects\Projects K-O\MDEQ0076\ENGAPPS\GIS\mxds\2019 QMCM SI\Fig5-4e QMCM SOIL QSS v20180511 Final.mxd 10:00:22 AM 1/17/2019 KBrown

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Figure 5-4e
Sample Analytical Result Map - Soil
(Quincy Stamp Sands)
Quincy Mining Company Mason Operations Area
Mason, Houghton County, Michigan

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Michigan Department of Environmental Quality

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Figure 5-5a
Sample Analytical Result Map - Groundwater
(Quincy Stamp Mills)
Quincy Mining Company Mason Operations Area
Mason, Houghton County, Michigan

FILE: W:\Projects\Projects K-O\MDEQ0079\ENGAPPS\GIS\mxds\2019_QMCM_SI\Fig5-5a_QMCM_GW_QSM_v20180511_Final.mxd 11:20:29 AM 1/17/2019 KBrown

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

- Cap Boundary (2005 NRCS)
- Mining Era Buildings and Structures
- QMCM Study Area Boundary

Notes:
- J = estimated value
- ug/l = micrograms per liter
- Sample depths shown in feet below ground surface (bgs).

N
0 150 Ft
Coordinate System: MIGeoRef(m)

DEQ
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Figure 5-5b
Sample Analytical Result Map - Groundwater
(Quincy Reclamation Plant)
Quincy Mining Company Mason Operations Area
Mason, Houghton County, Michigan

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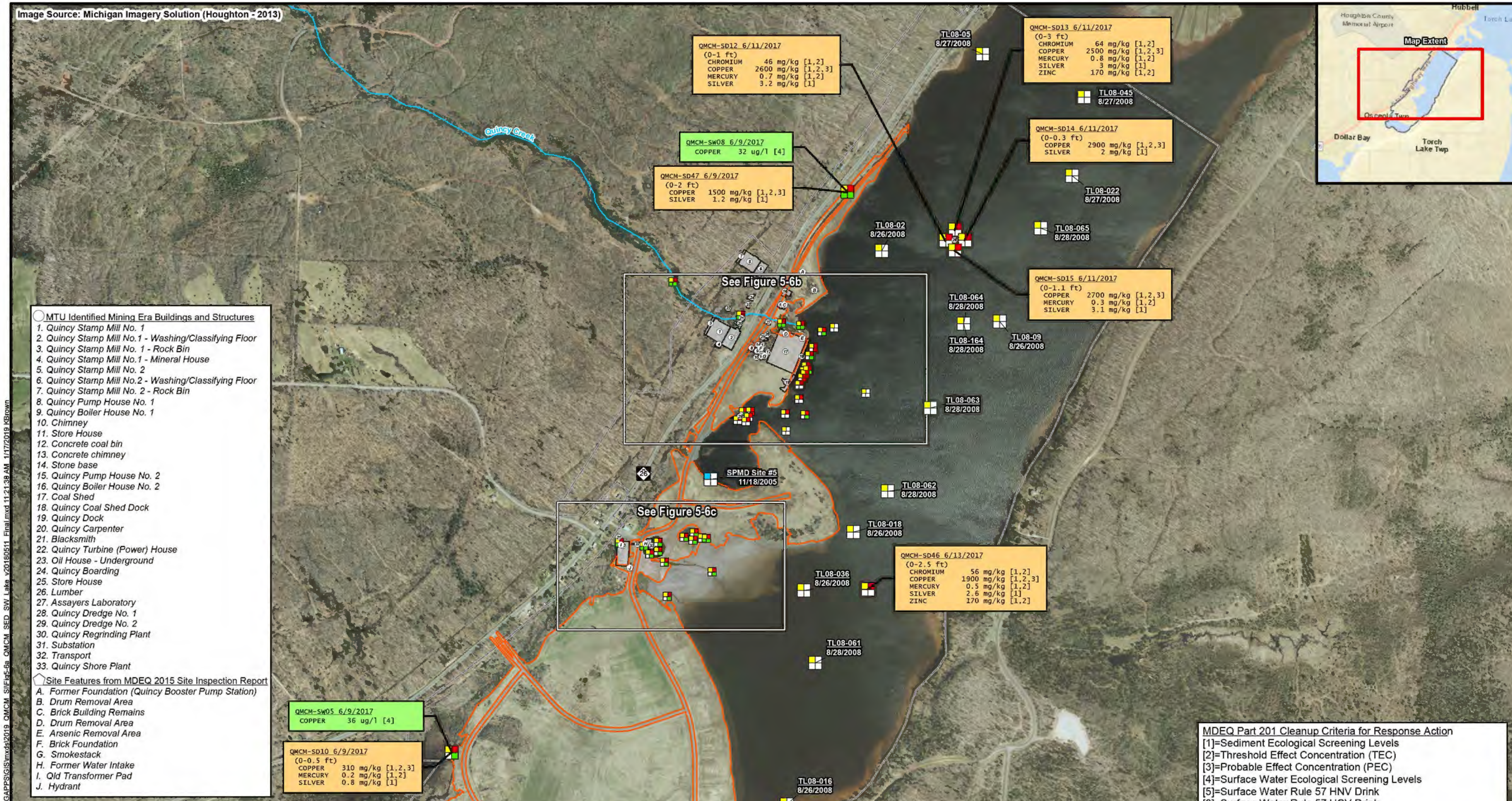
Figure 5-5c
Sample Analytical Result Map - Groundwater (Quincy Stamp Sands)
Quincy Mining Company Mason Operations Area
Mason, Houghton County, Michigan



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

- Cap Boundary (2005 NRCS)
- Mining Era Buildings and Structures
- QMCM Study Area Boundary

Notes:
- J = estimated value
- mg/kg = milligrams per kilogram
- ug/l = micrograms per liter

N
0 1,000 Ft
Coordinate System: MIGeoRef(m)

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Figure 5-6a
Sample Analytical Result Map - Sediment, Surface Water, and SPMD (Overview)
Quincy Mining Company Mason Operations Area
Mason, Houghton County, Michigan

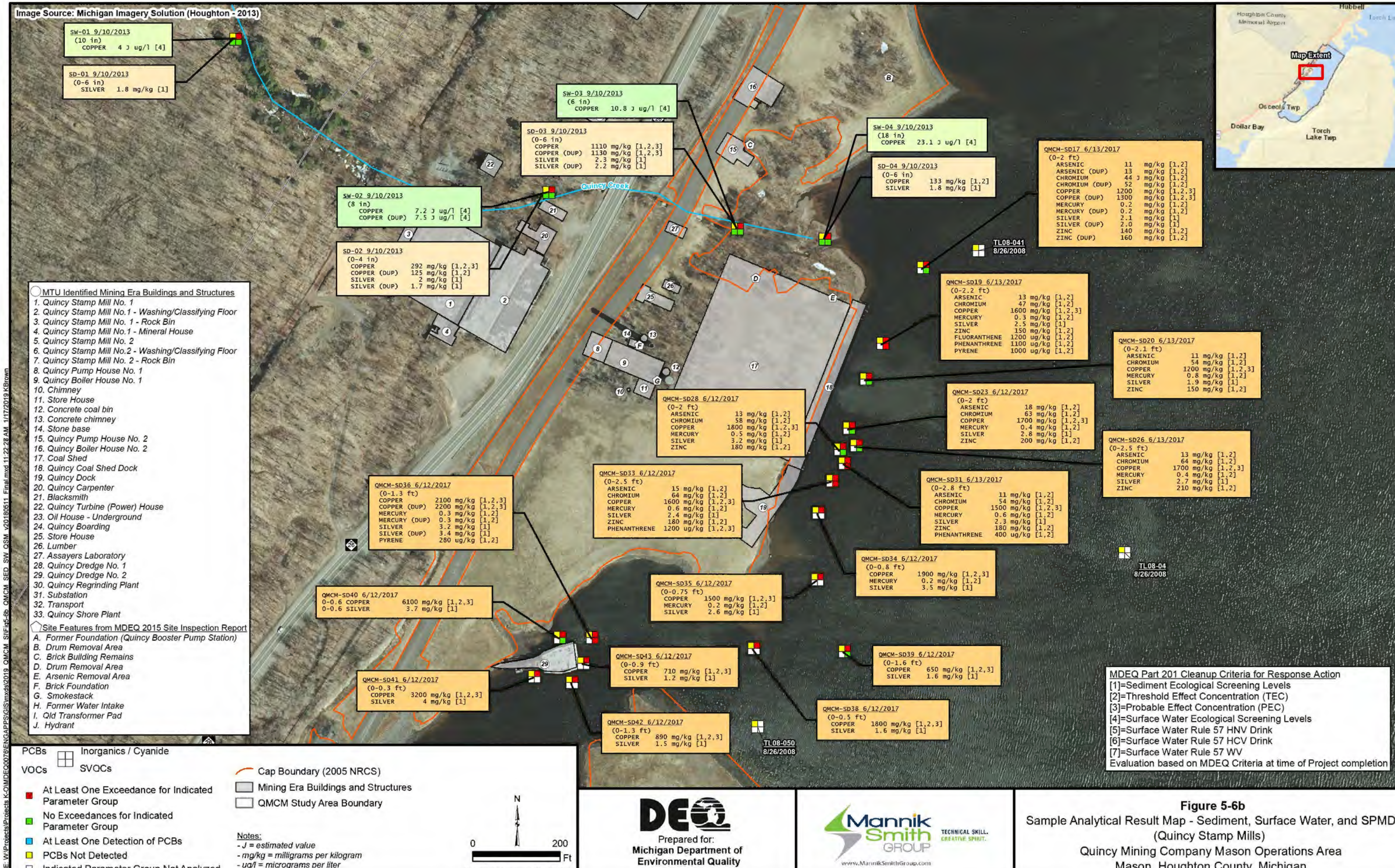

Figure 5-6b
Sample Analytical Result Map - Sediment, Surface Water, and SPMD
(Quincy Stamp Mills)
Quincy Mining Company Mason Operations Area
Mason, Houghton County, Michigan

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

Cap Boundary (2005 NRCS)
Mining Era Buildings and Structures
QMCM Study Area Boundary

Notes:
- J = estimated value
- mg/kg = milligrams per kilogram
- ug/kg = micrograms per kilogram
- ug/l = micrograms per liter

N
0 150 Ft
Coordinate System: MIGeoRef(m)

DEQ
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Figure 5-6c
Sample Analytical Result Map - Sediment, Surface Water, and SPMD
(Quincy Reclamation Plant)
Quincy Mining Company Mason Operations Area
Mason, Houghton County, Michigan

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TABLES

TABLE 3-1
Summary of Historical Operations
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Historical Building	Location	Mining Era Operation	Potential Contaminant Sources	Operational Practices
Quincy Stamp Mill No. 1	Quincy Stamp Mills	The mill was constructed between 1888 and 1890. Initially, two steam stamp heads were in operation, with a third added in 1892. Additions included the mineral house building in 1904, a new launder in 1910 and a eastward building extension that housed two additional steam stamps in 1918. Xanthate was used in the flotation process conducted within the building beginning in 1930. Operations at Quincy Stamp Mill No. 1 ceased in 1945 and the structure is still partially standing.	Potential for the use of oils and lubricants for maintenance of equipment. Potential asbestos containing material (ACM) used for insulation of equipment and fire retardant, along with uses in roofing material. Copper-bearing and metal-laden stamp sand discharged to Torch Lake	Chemical storage and disposal practices are not well understood. Post reclamation tailings were re-deposited in Torch Lake.
Quincy Boiler House No. 1	Quincy Stamp Mills	Quincy Boiler House No. 1 was constructed in between 1889 and 1890 when the Quincy Stamp Mill No. 1 was built, while an addition constructed in the early 1890s housed two more steam boilers. Two streams running through the site provided water for steam production to power Quincy Stamp Mill No. 1 and provide heating for other on-site buildings. Pump engines that provided water for ore milling in Quincy Stamp Mill No. 1 were also powered by the steam from the boilers and were located at the west end of the Quincy Boiler House No. 1.	Potential for the use of oils and lubricants for maintenance of equipment. Potential ACM used for insulation of equipment and fire retardant, along with uses in roofing material. Coal used in energy production. Potential for subsurface conduits and utility corridors creating preferential pathways to Torch Lake.	Coal was burned to supply energy for steam production. Twelve steam boilers were used initially, with two more added Disposal practice for coal ash is not well understood.

TABLE 3-1
Summary of Historical Operations
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Historical Building	Location	Mining Era Operation	Potential Contaminant Sources	Operational Practices
Quincy Stamp Mill No. 2	Quincy Stamp Mills	Quincy Stamp Mill No. 2 was built between 1898 and 1900 and contained three steam stamps, and its own boiler and pump houses. It ceased operation in 1921; however, the building was serviced with limited utilities for heat and lighting for at least two decades following its closure.	Potential for the use of oils and lubricants for maintenance of equipment. Potential ACM used for insulation of equipment and fire retardant, along with uses in roofing material. Copper-bearing and metal-laden stamp sand discharged to Torch Lake	Chemical storage and disposal practices are not well understood. Post reclamation tailings were re-deposited in Torch Lake.
Quincy Boiler House No. 2	Quincy Stamp Mills	Quincy Boiler House No. 2 was built at the time Quincy Stamp Mill No. 2 was constructed between 1898 and 1900 and contained five Hawley Downdraft Boilers which supplied steam to power the stamps located in Mill No. 2. The 75 foot tall iron smokestack had a stone base. The Boiler House ceased operation in 1921 and was later removed in the late 1940s.	Potential for the use of oils and lubricants for maintenance of equipment. Potential ACM used for insulation of equipment and fire retardant, along with uses in roofing material. Coal used in energy production. Particulate distribution from coal combustion	Coal was burned to supply energy for steam production. Disposal practice for coal ash is not well understood.

TABLE 3-1
Summary of Historical Operations
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Historical Building	Location	Mining Era Operation	Potential Contaminant Sources	Operational Practices
Pump House No. 2	Quincy Stamp Mills	Quincy Pump House No. 2 was built at the time of Quincy Stamp Mill No. 2 and its boiler house, between 1889 and 1900. The engines supplied water to Quincy Stamp Mill No. 2 and also provided water for fire suppression. Water was supplied through an adit that connected Torch Lake with Quincy Pump House No. 2. Operations at the pump house ceased in 1921. It is unknown when the structure was removed; however, it was last seen on the 1949 Sanborn Map.	Potential for the use of oils and lubricants for maintenance of equipment. Potential ACM used for insulation of equipment and fire retardant, along with uses in roofing material. Potential for subsurface conduits and utility corridors creating preferential pathways to Torch Lake.	Used to pump water from Torch Lake for steam production and fire protection.
Quincy Turbine (Power) House	Quincy Stamp Mills	The Quincy Turbine (Power) House was built in 1921 to house a 2,000 kilowatt (kW) mixed-pressure steam turbine in a effort to reduce its dependence on the Houghton County Electric Company. Most of the electrical needs were met by the turbine. Exhaust steam from Quincy Stamp Mill No. 1 was mostly used to power the generator; however, some steam from the Quincy Boiler House No. 1 was used as well.	Potential for the use of oils and lubricants for maintenance of equipment. ACM used for insulation of equipment and fire retardant.	Energy production for mill operations.

TABLE 3-1
Summary of Historical Operations
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Historical Building	Location	Mining Era Operation	Potential Contaminant Sources	Operational Practices
Quincy Coal Shed Dock (Dock No. 1)	Quincy Stamp Mills	Dock No. 1 was built in 1888 and expanded in 1891 and 1901 for a total length of 500 feet along the shoreline. The foundations on the western side were situated on land. It is unknown when the structure was no longer in use or when it was removed.	Potential ACM uses.	
Quincy Dock (Dock No. 2)	Quincy Stamp Mills	Dock No. 2 was built in 1899 on pilings in Torch Lake. It was built with equipment used to directly convey coal to Quincy Boiler House No. 2 and Quincy Stamp Mill No. 2. The Dock was most likely removed prior to 1953.	No known waste or pollution concerns associated with this structure.	
Coal Shed	Quincy Stamp Mills	The Coal Shed, along with three towers that unloaded coal from docked ships, were built in 1901 along the Mason shoreline. Machinery was added in 1917 to convey coal to Quincy Boiler House No. 1 and No. 2. All of the coal used at Quincy was received at the Mason dock and distributed by rail. The steel towers were scrapped in 1948; however, it is unknown when the coal shed was removed.	Concerns related to coal storage. Potential storage and handling of other oils and lubricants for maintenance of equipment.	Used for coal storage with a capacity of 4,000 tons.

TABLE 3-1
Summary of Historical Operations
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Historical Building	Location	Mining Era Operation	Potential Contaminant Sources	Operational Practices
Oil House	Quincy Stamp Mills	This structure was used to store oil for lubricating machinery and was built mostly underground. It is uncertain when it was built or removed; however, it was last seen on the 1949 Sanborn Map.	Potential storage and handling of other oils and lubricants for maintenance of equipment. Potential ACM used for fire retardant.	Used to store oil and may have contained other chemicals used for machine maintenance. Chemical storage and disposal practices are not well understood.
Quincy Dredge No. 1 and No. 2	Quincy Reclamation Plant	The original dredge was built in 1943, while the second dredge was bought used from C&H in 1955. During the first decade of operation, the dredge was used to recover stamp sand from the deposit located to the south of Quincy Stamp Mill No. 1. The mobile dredge was towed in a systematic manner in order to recover the stamp sands. By the mid 1950's, the dredge was used to recover the sand bank from Quincy Stamp Mill No. 2., which included a substantial portion of above-water material. The original dredge sank in 1956 and remains in Torch Lake. The second dredge, Quincy Dredge No. 2, ceased operation in 1967 and remains along the shoreline in Mason.	Transformers and an oil filled circuit breaker were known to be located within the dredge when it sank in Torch Lake. The second dredge in Mason likely has similar equipment. Potential ACM used for insulation of equipment and fire retardant, along with uses in roofing material.	Used to recover stamp sand from the sand banks of Torch Lake that were then treated and processed in the reclamation plant complex.

TABLE 3-1
Summary of Historical Operations
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Historical Building	Location	Mining Era Operation	Potential Contaminant Sources	Operational Practices
Quincy Shore Plant	Quincy Reclamation Plant	The Quincy Shore Plant was built in 1943, modified in 1944 and included a pump for pulling in tailings from the dredge. The building originally belonged to C&H, was disassembled, moved to Mason and re-erected. Along with the pump, the building contained classifying equipment and conveyors used to move material to the ball mills and flotation floor of the Quincy Regrinding Plant. The Quincy Shore Plant was expanded in 1944 when a 35-foot diameter settling tank was built. Except for a few intermittent interruptions that coincided with idle reclamation operations, the shore plant operated continuously until the Reclamation Plant shut down in 1967. The structure was removed in the 1970s.	Three transformers and associated electrical tower were located outside of the building; however, the specific location is unknown. Potential ACM used for insulation of equipment as a fire retardant, along with uses in roofing material.	Used to classify coarse stamp sands from fine slimes recovered using the dredge. Material was conveyed to the Regrinding Plant for processing.
Quincy Regrinding Plant	Quincy Reclamation Plant	The Quincy Regrinding Plant was built in 1942 and 1943. The structure had been previously owned by C&H, when it was dismantled, relocated and re-erected in Mason. Stamp sands carried by conveyor from the Quincy Shore Plant were fed from a "surge" bin at the north end into a series of Hardinge ball mills for grinding prior to treatment by flotation. During the flotation process, water and pine oil were agitated to create a froth. Adding xanthate allowed a chemical reaction to occur which caused the copper particles to adhere to the pine oil froth. The copper-bearing froth was skimmed from the top, thickened and dried, and transported by rail to the smelter. Post-reclamation tailings were redeposited in Torch Lake. The Quincy Regrinding Plant was shut down in 1967, along with the rest of the reclamation plant complex.	Potential PCB oil-filled transformers, and substation equipment including switchgear and circuit breakers, located in the northwest corner. Storage and disposal practices for xanthate and pine oil used within the plant. Copper-bearing, post reclamation tailings re-deposited in Torch Lake Potential ACM used for insulation of equipment and fire retardant, along with uses in roofing material.	Chemical storage and disposal practices are not well understood. Post reclamation tailings were re-deposited in Torch Lake.

TABLE 3-2
Sampling and Analysis Summary
Quincy Mining Company Mason 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
Quincy Stamp Mills								
QMCM-SS01	5/16/2017	QMCM-SS01 0"-6"	1705192	-88.459520102	47.149064657	Data Gap - Near Stamp Mill No. 1 and No. 2	Dark brown, fine SAND	--
QMCM-SS02	5/16/2017	QMCM-SS02 0"-6"	1705192	-88.459337166	47.148997665	Data Gap - Near Stamp Mill No. 1 and No. 2	Reddish-brown, medium SAND; dry	--
QMCM-SS03	5/16/2017	QMCM-SS03 0"-6"	1705192	-88.458850092	47.148898543	Near XRF locations exceeding direct contact criteria (XRF-141 and XRF-144)	Gray gravelly SAND; dry	--
QMCM-SS04	5/16/2017	QMCM-SS04 0"-6"	1705192, 240-79773-1	-88.459684902	47.148776604	Data Gap - Near Stamp Mill No. 1 and No. 2	Brown fine SAND; moist	--
QMCM-SS05	5/16/2017	QMCM-SS05 0"-6"	1705192, 240-79773-1	-88.458530337	47.148737878	Near XRF location exceeding direct contact criteria (XRF-132)	Dark brown SAND fine to medium grained with some organics	--
QMCM-SS06	5/16/2017	QMCM-SS06 0"-6"	1705192	-88.459169645	47.148571630	Data Gap - Near Stamp Mill No. 1 and No. 2	Brown SAND with trace silt; moist	--
QMCM-SS07	5/16/2017	QMCM-SS07 0"-6"	1705192	-88.458670738	47.148572894	Near XRF location exceeding direct contact criteria (XRF-133)	Dark brown SAND, fine to medium with trace gravel; moist	--
QMCM-SS08	5/16/2017	QMCM-SS08 0"-6"	1705192	-88.459740523	47.148489007	Data Gap - Near Stamp Mill No. 1 and No. 2	Brown silty fine SAND; moist	--
QMCM-SS09	5/16/2017	QMCM-SS09 0"-6"	1705192	-88.458901577	47.148204084	Data Gap - Near Stamp Mill No. 1 and No. 2	Dark brown and black SAND with trace silt; moist	--
QMCM-SS10	5/16/2017	QMCM-SS10 0"-6"	1705192	-88.459516181	47.148174524	Data Gap - Near Stamp Mill No. 1 and No. 2	Dark brown and black SAND with organics; moist	--
QMCM-SS11	5/16/2017	QMCM-SS11 0"-6"	1705192	-88.460022160	47.148027553	Data Gap - Near Stamp Mill No. 1 and No. 2	Brown SAND fine grained; dry	--
QMCM-SS12	5/16/2017	QMCM-SS12 0"-6"	1705192	-88.459875384	47.147753670	Data Gap - Near Stamp Mill No. 1 and No. 2	Reddish-brown silty SAND; moist	--
QMCM-SS13	5/16/2017	QMCM-SS13 0"-6"	1705192	-88.460775913	47.147622029	Soil Pile/Stamp Sand Pile	Gray gravelly SAND; dry	--
QMCM-SS14	5/16/2017	QMCM-SS14 0"-6"	1705192	-88.460529921	47.147547789	Soil Pile/Stamp Sand Pile	Gray gravelly SAND; dry	--
QMCM-SS15	5/16/2017	QMCM-SS15 0"-6"	1705192	-88.460647346	47.147280183	Data Gap - Near Stamp Mill No. 1 and No. 2	Yellowish fine SAND with trace gravel; dry	--
QMCM-SS16	5/16/2017	QMCM-SS16 0"-6"	1705193	-88.461144709	47.147294582	Data Gap - Near Stamp Mill No. 1 and No. 2	Dark brown, fine SAND; moist with organics	--
QMCM-SS17	5/16/2017	QMCM-SS17 0"-6"	1705192, 240-79773-1	-88.460148088	47.147172677	Near XRF location exceeding direct contact criteria (XRF-115)	Dark brown, fine SAND	--
QMCM-SS18	5/16/2017	QMCM-SS18 0"-6"	1705193, 240-79773-1	-88.461375859	47.147007927	Data Gap - Near Stamp Mill No. 1 and No. 2	Brown fine SAND; moist with organics	--
QMCM-SS19	5/16/2017	QMCM-SS19 0"-6"	1705193	-88.460710773	47.146986929	Near XRF location exceeding direct contact criteria (XRF-122)	Brown, gravelly SAND fine to medium SAND; dry	--
QMCM-SS20	5/16/2017	QMCM-SS20 0"-6"	1705193	-88.460250374	47.147029236	Near XRF location exceeding direct contact criteria (XRF-114)	Dark brown gravelly fine to medium SAND; dry	--
QMCM-SS21	5/16/2017	QMCM-SS21 0"-6"	1705193	-88.461242444	47.146611025	Surface soil - Stamp Mill No.1 and No. 2 area	Brown SAND fine to medium grained; moist with organics	--
QMCM-SS22	5/16/2017	QMCM-SS22 0"-6"	1705193	-88.460794940	47.146496826	Near XRF location exceeding direct contact criteria (XRF-107)	Brown to red, silty SAND fine grained with debris	--
QMCM-SS23	5/16/2017	QMCM-SS23 0"-6"	1705193, 240-79773-1	-88.460268777	47.146441453	Near XRF location exceeding direct contact criteria (XRF-102)	Brown to red SAND	--
QMCM-SS24	5/16/2017	QMCM-SS24 0"-6"	1705193	-88.460888162	47.146278853	Data Gap - Near Stamp Mill No. 1 and No. 2	Brown fine to medium SAND with some gravel; moist	--
QMCM-SS25	5/17/2017	QMCM-SS25 0"-6"	1705194	-88.457616706	47.148024927	Data Gap - North of Former Coal Shed (various XRF locations exceed direct contact criteria)	Dark brown fine to medium SAND with some gravel; moist	--
QMCM-SS26	5/17/2017	QMCM-SS26 0"-6"	1705194	-88.457812501	47.148015123	Data Gap - North of Former Coal Shed (various XRF locations exceed direct contact criteria)	Dark brown fine to coarse SAND with some gravel; moist	--
QMCM-SS27	5/17/2017	QMCM-SS27 0"-6"	1705194	-88.457165064	47.147856148	Data Gap - North of Former Coal Shed (various XRF locations exceed direct contact criteria)	Dark brown fine to coarse SAND with some gravel; moist	--
QMCM-SS28	5/17/2017	QMCM-SS28 0"-6"	1705194	-88.457336947	47.147777356	Data Gap - North of Former Coal Shed (various XRF locations exceed direct contact criteria)	Dark brown to black medium to coarse grained SAND with some gravel; moist	--
QMCM-SS29	5/17/2017	QMCM-SS29 0"-6"	1705194	-88.457715841	47.147635454	Data Gap - North of Former Coal Shed (various XRF locations exceed direct contact criteria)	Brown SAND; moist	--
QMCM-SS30	5/17/2017	QMCM-SS30 0"-6"	1705194	-88.457421611	47.147612437	Data Gap - North of Former Coal Shed (various XRF locations exceed direct contact criteria)	Brown coarse SAND; moist	--
QMCM-SS31	5/17/2017	QMCM-SS31 0"-6"	1705194	-88.457837973	47.147372262	Data Gap - North of Former Coal Shed (various XRF locations exceed direct contact criteria)	Gray to brown coarse SAND with some gravel; moist	--
QMCM-SS32	5/17/2017	QMCM-SS32 0"-6"	1705194	-88.457565641	47.147361642	Data Gap - North of Former Coal Shed (various XRF locations exceed direct contact criteria)	Dark brown fine to medium grained SAND with some silty; moist	--
QMCM-SS33	5/17/2017	QMCM-SS33 0"-6"	1705194	-88.457598505	47.147177827	Data Gap - North of Former Coal Shed (various XRF locations exceed direct contact criteria)	Brown medium SAND; moist	--
QMCM-SS34	5/17/2017	QMCM-SS34 0"-6"	1705194	-88.457798317	47.147107828	Data Gap - North of Former Coal Shed (various XRF locations exceed direct contact criteria)	Dark brown medium to coarse SAND; moist	--
QMCM-SS35	5/17/2017	QMCM-SS35 0"-6"	1705194, 240-79773-1	-88.457537156	47.147040627	Data Gap - North of Former Coal Shed (various XRF locations exceed direct contact criteria)	Brown medium to coarse SAND; with some gravel, moist	--
QMCM-SS36	5/17/2017	QMCM-SS36 0"-6"	1705194	-88.457073715	47.146955097	Data Gap - North of Former Coal Shed (various XRF locations exceed direct contact criteria)	Brown medium to coarse SAND; with some gravel	--
QMCM-SS37	5/17/2017	QMCM-SS37 0"-6"	1705193	-88.458878486	47.146581054	Data Gap - West of Former Coal Shed (various XRF locations exceed direct contact criteria)	Dark brown gravelly SAND; moist with organics	--
QMCM-SS38	5/17/2017	QMCM-SS38 0"-6"	1705193	-88.459011531	47.146536950	Data Gap - West of Former Coal Shed (various XRF locations exceed direct contact criteria)	Brown gravelly SAND; moist with organics	--
QMCM-SS39	5/17/2017	QMCM-SS39 0"-6"	1705193	-88.458699267	47.146541555	Data Gap - West of Former Coal Shed (various XRF locations exceed direct contact criteria)	Dark brown gravelly SAND; moist with organics	--
QMCM-SS40	5/17/2017	QMCM-SS40 0"-6"	1705193	-88.458808677	47.146443630	Data Gap - West of Former Coal Shed (various XRF locations exceed direct contact criteria)	Brown gravelly SAND; moist with organics	--
QMCM-SS47	5/16/2017	QMCM-SS47 0"-6"	1705192	-88.460337742	47.147660600	Near Quincy Turbine (Power) House	Dark brown SAND with trace gravel; moist, organics	--
QMCM-SS48	5/16/2017	QMCM-SS48 0"-6"	1705192	-88.460351880	47.147520820	Near Quincy Turbine (Power) House	Dark brown SAND with trace gravel; moist	--
QMCM-SS49	5/16/2017	QMCM-SS49 0"-6"	1705193	-88.461269690	47.146349060	Proximal to black residue in container (Observation: Container#9)	Dark brown to black medium SAND with organics	--

TABLE 3-2
Sampling and Analysis Summary
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

					Sample Type/Matrix						Requested Laboratory Analyses							Water Quality Parameters					Duplicate Analyses						
Proposed Sampling Location	Sample Date	Field Sample Identification	Sample Notes	Sampling Method	Surface Soil	Subsurface Soil	Groundwater	Surface Water	Sediment	Drums, Containers, and Building Materials/SACM	VOCs	SVOCs	PCBs	Metals	Cyanide	Asbestos	Waste Characterization	Temperature (C°)	Conductivity (mS/cm)	Dissolved Oxygen (%)	pH	Turbidity (nTu)	VOCs	SVOCs	PCBs	Metals	Cyanide	Asbestos	Waste Characterization
Quincy Stamp Mills																													
QMCM-SS01	5/16/2017	QMCM-SS01 0"-6"		Hand Tools	X									X															
QMCM-SS02	5/16/2017	QMCM-SS02 0"-6"		Hand Tools	X									X															
QMCM-SS03	5/16/2017	QMCM-SS03 0"-6"		Hand Tools	X									X															
QMCM-SS04	5/16/2017	QMCM-SS04 0"-6"		Hand Tools	X									X		X													
QMCM-SS05	5/16/2017	QMCM-SS05 0"-6"		Hand Tools	X									X		X													
QMCM-SS06	5/16/2017	QMCM-SS06 0"-6"		Hand Tools	X									X															
QMCM-SS07	5/16/2017	QMCM-SS07 0"-6"		Hand Tools	X									X															
QMCM-SS08	5/16/2017	QMCM-SS08 0"-6"		Hand Tools	X									X															
QMCM-SS09	5/16/2017	QMCM-SS09 0"-6"		Hand Tools	X									X															
QMCM-SS10	5/16/2017	QMCM-SS10 0"-6"		Hand Tools	X									X												X			
QMCM-SS11	5/16/2017	QMCM-SS11 0"-6"		Hand Tools	X									X															
QMCM-SS12	5/16/2017	QMCM-SS12 0"-6"		Hand Tools	X									X															
QMCM-SS13	5/16/2017	QMCM-SS13 0"-6"		Hand Tools	X									X															
QMCM-SS14	5/16/2017	QMCM-SS14 0"-6"		Hand Tools	X									X															
QMCM-SS15	5/16/2017	QMCM-SS15 0"-6"		Hand Tools	X									X															
QMCM-SS16	5/16/2017	QMCM-SS16 0"-6"		Hand Tools	X									X															
QMCM-SS17	5/16/2017	QMCM-SS17 0"-6"		Hand Tools	X									X		X													
QMCM-SS18	5/16/2017	QMCM-SS18 0"-6"		Hand Tools	X									X		X													
QMCM-SS19	5/16/2017	QMCM-SS19 0"-6"		Hand Tools	X									X															
QMCM-SS20	5/16/2017	QMCM-SS20 0"-6"		Hand Tools	X									X												X			
QMCM-SS21	5/16/2017	QMCM-SS21 0"-6"		Hand Tools	X									X															
QMCM-SS22	5/16/2017	QMCM-SS22 0"-6"		Hand Tools	X									X															
QMCM-SS23	5/16/2017	QMCM-SS23 0"-6"		Hand Tools	X									X		X													
QMCM-SS24	5/16/2017	QMCM-SS24 0"-6"		Hand Tools	X									X															
QMCM-SS25	5/17/2017	QMCM-SS25 0"-6"		Hand Tools	X									X															
QMCM-SS26	5/17/2017	QMCM-SS26 0"-6"		Hand Tools	X									X															
QMCM-SS27	5/17/2017	QMCM-SS27 0"-6"		Hand Tools	X									X															
QMCM-SS28	5/17/2017	QMCM-SS28 0"-6"		Hand Tools	X									X															
QMCM-SS29	5/17/2017	QMCM-SS29 0"-6"		Hand Tools	X									X															
QMCM-SS30	5/17/2017	QMCM-SS30 0"-6"		Hand Tools	X									X												X			
QMCM-SS31	5/17/2017	QMCM-SS31 0"-6"		Hand Tools	X									X															
QMCM-SS32	5/17/2017	QMCM-SS32 0"-6"		Hand Tools	X									X															
QMCM-SS33	5/17/2017	QMCM-SS33 0"-6"		Hand Tools	X									X															
QMCM-SS34	5/17/2017	QMCM-SS34 0"-6"		Hand Tools	X									X															
QMCM-SS35	5/17/2017	QMCM-SS35 0"-6"		Hand Tools	X									X		X													
QMCM-SS36	5/17/2017	QMCM-SS36 0"-6"		Hand Tools	X									X															
QMCM-SS37	5/17/2017	QMCM-SS37 0"-6"		Hand Tools	X									X															
QMCM-SS38	5/17/2017	QMCM-SS38 0"-6"		Hand Tools	X									X															
QMCM-SS39	5/17/2017	QMCM-SS39 0"-6"		Hand Tools	X									X															
QMCM-SS40	5/17/2017	QMCM-SS40 0"-6"		Hand Tools	X									X												X			
QMCM-SS47	5/16/2017	QMCM-SS47 0"-6"		Hand Tools	X							X	X	X	X														
QMCM-SS48	5/16/2017	QMCM-SS48 0"-6"		Hand Tools	X							X	X	X	X											X			
QMCM-SS49	5/16/2017	QMCM-SS49 0"-6"		Hand Tools	X						X	X	X	X									X	X					

TABLE 3-2
Sampling and Analysis Summary
Quincy Mining Company Mason 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
Quincy Stamp Mills (continued)								
QMCM-SS50	9/17/2017	QMCM-SS50 0"-6"	1709156	-88.458626524	47.148731225	Proximal to SS-12 (9/12/2013)	Dark brown SAND to gravel	--
QMCM-SS51	9/17/2017	QMCM-SS51 0"-6"	1709156	-88.458515832	47.148671051	Proximal to SS-12 (9/12/2013)	Dark brown SAND with gravel; organics, brick debris	--
QMCM-SS52	9/17/2017	QMCM-SS52 0"-6"	1709156	-88.459230078	47.147628095	Proximal to QMCM-SB07 (5/16/2017), approximately 10ft south	Dark brown sandy loam; organics	--
QMCM-SS53	9/17/2017	QMCM-SS53 0"-6"	1709156	-88.459200076	47.147641623	Proximal to QMCM-SB07 (5/16/2017), approximately 10ft east	Brown sandy loam	--
QMCM-SS54	9/17/2017	QMCM-SS54 0"-6"	1709156	-88.459186171	47.147648303	Proximal to QMCM-SB07 (5/16/2017), approximately 10ft northeast	Dark brown medium SAND; organics	--
QMCM-SB01	5/17/2017	QMCM-SB01 0"-6"	1705195, 240-79773-1	-88.456735479	47.148378556	Former dump area and near soil sample SS-15 (9/11/2013)	TOPSOIL to 6 in	--
	5/17/2017	QMCM-SB01 6"-8"	1705195			Former dump area and near soil sample SS-15 (9/11/2013)	SAND, Medium, gray to 5 ft; SILT SAND, Fine, gray to 8.5 ft	--
QMCM-SB02	5/17/2017	QMCM-SB02 4"-10"	1705195	-88.456400457	47.148230264	Former dump area and near soil sample SS-15 (9/11/2013)	GRAVEL, Reddish brown to 1 ft	--
	5/17/2017	QMCM-SB02 10"-4'	1705195			Former dump area and near soil sample SS-15 (9/11/2013)	GRAVEL, Reddish brown to 1 ft; SILT SAND, Fine, gray to 4 ft	--
QMCM-SB03	5/17/2017	QMCM-SB03 0"-6"	1705195	-88.456962229	47.148111678	Former dump area and near soil sample SS-15 (9/11/2013)	TOPSOIL to 6 in, No Cap Present	--
	5/17/2017	QMCM-SB03 6"-5'	1705195			Former dump area and near soil sample SS-15 (9/11/2013)	SAND, Medium, dark gray to 3.5 ft; SAND, Fine to medium, reddish brown to 9 ft, saturated at 5 ft	--
QMCM-SB04	5/17/2017	QMCM-SB04 6"-12"	1705195	-88.456710046	47.148110286	Former dump area and near soil sample SS-15 (9/11/2013)	SAND, Coarse, gray to 5 ft; saturated at 2 ft	--
	5/17/2017	QMCM-SB04 12"-24"	1705195			Former dump area and near soil sample SS-15 (9/11/2013)	SAND, Coarse, gray to 5 ft; saturated at 2 ft	--
QMCM-SB05	5/16/2017	QMCM-SB05 0-6"	1705196	-88.459567911	47.147755980	Proximal to underground oil house	SAND, Fine, light brown to 6 in	--
	5/16/2017	QMCM-SB05 6"-10'	1705196			Proximal to underground oil house	SAND, Fine, reddish brown to 7 ft; SAND, Coarse, brown to 8 ft; SAND, Fine, reddish brown to 10 ft; refusal at 10 ft	--
QMCM-SB06	5/16/2017	QMCM-SB06 0-6"	1705196	-88.459403564	47.147703326	Above underground oil house	TOPSOIL, Silty Loam to 6 in	--
	5/16/2017	QMCM-SB06 6"-12'	1705196			Above underground oil house	SAND, Fine, reddish brown to 7 ft	--
QMCM-SB07	5/16/2017	QMCM-SB07 0-6"	1705196	-88.459222450	47.147645460	Proximal to underground oil house	TOPSOIL, Silty Loam to 6 in	--
	5/16/2017	QMCM-SB07 6"-4'	1705196			Proximal to underground oil house	SAND, Fine, reddish brown to 4 ft; Refusal at 4 ft - possible bedrock	--
QMCM-SB08	5/16/2017	QMCM-SB08 0-6"	1705196	-88.460152907	47.147718679	Near Quincy Turbine (Power) House	TOPSOIL to 6 in	--
	5/16/2017	QMCM-SB08 6"-30"	1705196			Near Quincy Turbine (Power) House	SAND, Fine to medium, reddish brown to 2.5 ft; Refusal at 2.5 ft - possible bedrock	--
QMCM-SB10	5/16/2017	QMCM-SB10 0-6"	1705196	-88.460112401	47.147558531	Near Quincy Turbine (Power) House	SILTY CLAY, Reddish brown to 1 ft	--
	5/16/2017	QMCM-SB10 6"-10'	1705196			Near Quincy Turbine (Power) House	SAND, Fine to medium, reddish brown to 10 ft; refusal at 10 ft - possible bedrock	--
QMCM-SB12	5/17/2017	QMCM-SB12 0"-6"	1705196	-88.457394784	47.146995482	Around SB-07 (9/10/2013)	SAND, Fine, reddish brown to 1.5 ft	--
	5/17/2017	QMCM-SB12 6"-3'	1705196			Around SB-07 (9/10/2013)	SAND, Coarse, gray to 3 ft	--
QMCM-SB13	5/17/2017	QMCM-SB13 0"-6"	1705196, 240-79773-1	-88.457558864	47.146935830	Around SB-07 (9/10/2013)	TOPSOIL to 6 in; No Cap Present	--
	5/17/2017	QMCM-SB13 6"-4'	1705196			Around SB-07 (9/10/2013)	SAND, Medium to coarse, gray to 5 ft, saturated at 4 ft	--
QMCM-SB14	5/17/2017	QMCM-SB14 0"-6"	1705196	-88.457229817	47.146902015	Around SB-07 (9/10/2013)	SAND, Medium to coarse, gray to 3 ft	--
	5/17/2017	QMCM-SB14 6"-3'	1705196			Around SB-07 (9/10/2013)	SAND, Medium to coarse, gray to 3 ft	--
QMCM-SB15	5/17/2017	QMCM-SB15 6"-12"	1705196	-88.457410139	47.146837431	Around SB-07 (9/10/2013)	SAND, Medium to coarse, gray to 4 ft	--
	5/17/2017	QMCM-SB15 12"-4'	1705196			Around SB-07 (9/10/2013)	SAND, Medium to coarse, gray to 4 ft	--
QMCM-SB16	5/17/2017	QMCM-SB16 0"-6"	1705196	-88.458293615	47.146804280	Around SS-08 (9/11/2013)	SAND, Medium with gravel, gray to 1 ft	--
	5/17/2017	QMCM-SB16 6"-6'	1705196			Around SS-08 (9/11/2013)	SAND, Fine to medium, reddish brown to 9 ft; saturated at 6 feet	--
QMCM-SB17	5/18/2017	QMCM-SB17 0"-6"	1705195	-88.458534151	47.146748330	Around SS-08 (9/11/2013)	SILTY SAND, Fine, dark gray to 1.5 ft	--
	5/18/2017	QMCM-SB17 6"-6'	1705195			Around SS-08 (9/11/2013)	SAND, Fine to medium, reddish brown to 9 ft; saturated at 6 feet	--
QMCM-SB18	5/18/2017	QMCM-SB18 0"-6"	1705195, 240-79773-1	-88.458189443	47.146634387	Around SS-08 (9/11/2013)	SILTY SAND, Fine, dark gray to 6ft	--
	5/18/2017	QMCM-SB18 6"-8'	1705195			Around SS-08 (9/11/2013)	SILTY SAND, Fine, dark gray to 6ft; SAND, Fine to medium, reddish brown to	--
QMCM-SB19	5/17/2017	QMCM-SB19 0"-6"	1705195	-88.458382864	47.146580868	Around SS-08 (9/11/2013)	SAND, Medium to coarse, gray to 1 ft	--
	5/17/2017	QMCM-SB19 6"-7'	1705195			Around SS-08 (9/11/2013)	SAND, Fine to medium, reddish brown to 9 ft; saturated at 7 ft	--

TABLE 3-2
Sampling and Analysis Summary
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Proposed Sampling Location	Sample Date	Field Sample Identification	Sample Notes	Sampling Method	Sample Type/Matrix						Requested Laboratory Analyses							Water Quality Parameters					Duplicate Analyses						
					Surface Soil	Subsurface Soil	Groundwater	Surface Water	Sediment	Drums, Containers, and Building Materials/SACM	VOCs	SVOCs	PCBs	Metals	Cyanide	Asbestos	Waste Characterization	Temperature (C°)	Conductivity (mS/cm)	Dissolved Oxygen (%)	pH	Turbidity (nTu)	VOCs	SVOCs	PCBs	Metals	Cyanide	Asbestos	Waste Characterization
Quincy Stamp Mills (continued)																													
QMCM-SS50	9/17/2017	QMCM-SS50 0"-6"		Hand Tools	X						X	X																	
QMCM-SS51	9/17/2017	QMCM-SS51 0"-6"		Hand Tools	X						X	X																	
QMCM-SS52	9/17/2017	QMCM-SS52 0"-6"		Hand Tools	X						X	X																	
QMCM-SS53	9/17/2017	QMCM-SS53 0"-6"		Hand Tools	X						X	X																	
QMCM-SS54	9/17/2017	QMCM-SS54 0"-6"		Hand Tools	X						X	X																	
QMCM-SB01	5/17/2017	QMCM-SB01 0"-6"	Duplicate added	Direct Push Boring	X						X	X	X	X	X	X							X	X	X	X	X		
	5/17/2017	QMCM-SB01 6"-8"	Duplicate added	Direct Push Boring		X					X	X	X	X	X								X	X	X	X	X		
QMCM-SB02	5/17/2017	QMCM-SB02 4"-10"		Direct Push Boring	X						X	X	X	X	X														
	5/17/2017	QMCM-SB02 10"-4'		Direct Push Boring		X					X	X	X	X	X														
QMCM-SB03	5/17/2017	QMCM-SB03 0"-6"		Direct Push Boring	X						X	X	X	X	X														
	5/17/2017	QMCM-SB03 6"-5'		Direct Push Boring		X					X	X	X	X	X														
QMCM-SB04	5/17/2017	QMCM-SB04 6"-12"		Direct Push Boring	X						X	X	X	X	X														
	5/17/2017	QMCM-SB04 12"-24"		Direct Push Boring		X					X	X	X	X	X														
QMCM-SB05	5/16/2017	QMCM-SB05 0-6"		Direct Push Boring	X						X	X	X	X	X														
	5/16/2017	QMCM-SB05 6"-10'	Duplicate omitted	Direct Push Boring		X					X	X	X	X	X														
QMCM-SB06	5/16/2017	QMCM-SB06 0-6"		Direct Push Boring	X						X	X	X	X	X														
	5/16/2017	QMCM-SB06 6"-12'		Direct Push Boring		X					X	X	X	X	X														
QMCM-SB07	5/16/2017	QMCM-SB07 0-6"		Direct Push Boring	X						X	X	X	X	X														
	5/16/2017	QMCM-SB07 6"-4'		Direct Push Boring		X					X	X	X	X	X														
QMCM-SB08	5/16/2017	QMCM-SB08 0-6"		Direct Push Boring	X						X	X	X	X	X														
	5/16/2017	QMCM-SB08 6"-30"		Direct Push Boring		X					X	X	X	X	X														
QMCM-SB10	5/16/2017	QMCM-SB10 0-6"		Direct Push Boring	X						X	X	X	X	X														
	5/16/2017	QMCM-SB10 6"-10'		Direct Push Boring		X					X	X	X	X	X														
QMCM-SB12	5/17/2017	QMCM-SB12 0"-6"		Direct Push Boring	X						X	X		X	X														
	5/17/2017	QMCM-SB12 6"-3'		Direct Push Boring		X					X	X		X	X														
QMCM-SB13	5/17/2017	QMCM-SB13 0"-6"		Direct Push Boring	X						X	X		X	X	X													
	5/17/2017	QMCM-SB13 6"-4'		Direct Push Boring		X					X	X		X	X														
QMCM-SB14	5/17/2017	QMCM-SB14 0"-6"		Direct Push Boring	X						X	X		X	X														
	5/17/2017	QMCM-SB14 6"-3'		Direct Push Boring		X					X	X		X	X														
QMCM-SB15	5/17/2017	QMCM-SB15 6"-12"		Direct Push Boring	X						X	X		X	X														
	5/17/2017	QMCM-SB15 12"-4'	Duplicate omitted	Direct Push Boring		X					X	X		X	X														
QMCM-SB16	5/17/2017	QMCM-SB16 0"-6"		Direct Push Boring	X						X	X		X	X														
	5/17/2017	QMCM-SB16 6"-6'		Direct Push Boring		X					X	X		X	X														
QMCM-SB17	5/18/2017	QMCM-SB17 0"-6"		Direct Push Boring	X						X	X		X	X														
	5/18/2017	QMCM-SB17 6"-6'		Direct Push Boring		X					X	X		X	X														
QMCM-SB18	5/18/2017	QMCM-SB18 0"-6"		Direct Push Boring	X						X	X		X	X	X													
	5/18/2017	QMCM-SB18 6"-8'		Direct Push Boring		X					X	X		X	X														
QMCM-SB19	5/17/2017	QMCM-SB19 0"-6"		Direct Push Boring	X						X	X		X	X														
	5/17/2017	QMCM-SB19 6"-7'		Direct Push Boring		X					X	X		X	X								X	X		X	X		

TABLE 3-2
Sampling and Analysis Summary
Quincy Mining Company Mason 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
Quincy Stamp Mills (continued)								
QMCM-SB20	5/18/2017	QMCM-SB20 0"-6"	1705195	-88.458389528	47.146244883	Around SS-07 (9/11/2013)	SILT, Dark gray to 1 ft	--
	5/18/2017	QMCM-SB20 6"-4'	1705195			Around SS-07 (9/11/2013)	SAND, Fine to medium, reddish brown to 4 ft	--
QMCM-SB21	5/18/2017	QMCM-SB21 0"-6"	1705253, 240-79773-1	-88.458595530	47.146194051	Around SS-07 (9/11/2013)	SAND, Medium to coarse, dark gray to 1.5 ft	--
	5/18/2017	QMCM-SB21 6"-6'	1705253			Around SS-07 (9/11/2013)	SAND, Fine to medium, brown to 9 ft; saturated at 6 ft	--
QMCM-SB22	5/18/2017	QMCM-SB22 12"-18"	1705195	-88.458302887	47.146093120	Around SS-07 (9/11/2013)	SAND, Coarse dark gray to 18 in	--
	5/18/2017	QMCM-SB22 18"-4'	1705196			Around SS-07 (9/11/2013)	SAND, Fine to medium, brown to 5 ft; saturated at 4 ft	--
QMCM-SB23	5/18/2017	QMCM-SB23 6"-12"	1705196	-88.458494814	47.146053295	Around SS-07 (9/11/2013)	CLAY CAP to 1 ft; SAND, Coarse, dark gray to 4 ft	--
	5/18/2017	QMCM-SB23 12"-6'	1705196			Around SS-07 (9/11/2013)	SAND, Coarse, dark gray to 4 ft; SAND, Fine to medium, brown, to 9 ft; saturated at 6 ft	--
QMCM-SB39	9/17/2017	QMCM-SB39 6"-12"	1709156	-88.456385493	47.148427300	Downgradient of uncapped Dump Area, capillary fringe sample beneath cap	SAND, Medium, gray, saturated at 4 ft	--
	9/17/2017	QMCM-SB39 12"-4'	1709156				SAND, Medium, gray, saturated at 4 ft	--
QMCM-SB40	9/17/2017	QMCM-SB40 6"-12"	1709156	-88.456198180	47.148191719	Downgradient of uncapped Dump Area, capillary fringe sample beneath cap	SAND, Medium, gray, saturated at 2 ft	--
	9/17/2017	QMCM-SB40 12"-24"	1709156				SAND, Medium, gray, saturated at 2 ft	--
QMCM-SB41	9/17/2017	QMCM-SB41 6"-12"	1709156	-88.456422429	47.148053173	Downgradient of uncapped Dump Area, capillary fringe sample beneath cap	SAND, Medium, gray, saturated at 3 ft	--
	9/17/2017	QMCM-SB41 12"-3'	1709156				SAND, Medium, gray, saturated at 3 ft	--
QMCM-SB42	9/17/2017	QMCM-SB42 6"-12"	1709156	-88.456735272	47.147925448	Downgradient of uncapped Dump Area, capillary fringe sample beneath cap	SAND, Medium, gray, saturated at 2 ft	--
	9/17/2017	QMCM-SB42 12"-24"	1709156				SAND, Medium, gray, saturated at 2 ft	--
QMCM-SD47	6/9/2017	QMCM-SD47 0-2'	1706169	-88.455311408	47.151089977	Sheen observed in ditch	SAND, fine grain, some gravel, red to GRAVELLY SAND, coarse grain, well sorted, red and brown, wet, black streak at 2ft, no odor	--
QMCM-SW08	6/9/2017	QMCM-SW08	1706166	-88.455311408	47.151089977	Sheen observed in ditch		--
QMCM-GW01	5/17/2017	QMCM-GW01 12-14'	1705197	-88.456735479	47.148378556	Former dump area and near soil sample SS-15 (9/11/2013)	Temporary Screen Interval: 12 ft - 14 ft	--
QMCM-GW02	5/17/2017	QMCM-GW02 10-12'	1705197	-88.456400457	47.148230264	Former dump area and near soil sample SS-15 (9/11/2013)	Temporary Screen Interval: 10 ft - 12 ft	--
QMCM-GW03	5/17/2017	QMCM-GW03 10-12'	1705197	-88.456962229	47.148111678	Former dump area and near soil sample SS-15 (9/11/2013)	Temporary Screen Interval: 10 ft - 12 ft	--
QMCM-GW04	5/17/2017	QMCM-GW04 8-10'	1705197	-88.456710046	47.148110286	Former dump area and near soil sample SS-15 (9/11/2013)	Temporary Screen Interval: 8 ft - 10 ft	--
QMCM-GW05	5/16/2017	QMCM-GW05 a-b'		-88.459567911	47.147755980	Proximal to underground oil house	Refusal at 10 ft - possible bedrock; No groundwater encountered.	--
QMCM-GW06	5/16/2017	QMCM-GW06 a-b'		-88.459403564	47.147703326	Above underground oil house	Refusal at 12 ft - possible bedrock; No groundwater encountered.	--
QMCM-GW07	5/16/2017	QMCM-GW07 a-b'		-88.459222450	47.147645460	Proximal to underground oil house	Refusal at 4 ft - possible bedrock; No groundwater encountered.	--
QMCM-GW08	5/16/2017	QMCM-GW08 a-b'		-88.460152907	47.147718679	Near Quincy Turbine (Power) House	Refusal at 2.5 ft - possible bedrock; No groundwater encountered.	--
QMCM-GW10	5/16/2017	QMCM-GW10 a-b'		-88.460112401	47.147558531	Near Quincy Turbine (Power) House	Refusal at 10 ft - possible bedrock; No groundwater encountered.	--
QMCM-GW12	5/17/2017	QMCM-GW12 8'-13'	1705197	-88.457394784	47.146995482	Around SB-07 (9/10/2013)	Temporary Screen Interval: 8 ft - 13 ft	--
QMCM-GW13	5/17/2017	QMCM-GW13 8-13'	1705197	-88.457558864	47.146935830	Around SB-07 (9/10/2013)	Temporary Screen Interval: 8 ft - 13 ft	--
QMCM-GW14	5/17/2017	QMCM-GW14 8'-13'	1705197	-88.457229817	47.146902015	Around SB-07 (9/10/2013)	Temporary Screen Interval: 8 ft - 13 ft	--
QMCM-GW15	5/17/2017	QMCM-GW15 8'-13'	1705197	-88.457410139	47.146837431	Around SB-07 (9/10/2013)	Temporary Screen Interval: 8 ft - 13 ft	--
QMCM-GW16	5/17/2017	QMCM-GW16 10'-15'	1705197	-88.458293615	47.146804280	Around SS-08 (9/11/2013)	Temporary Screen Interval: 10 ft - 15 ft	--
QMCM-GW17	5/18/2017	QMCM-GW17 10-15'	1705197	-88.458534151	47.146748330	Around SS-08 (9/11/2013)	Temporary Screen Interval: 10 ft - 15 ft	--
QMCM-GW18	5/18/2017	QMCM-GW18 12-17'	1705197	-88.458189443	47.146634387	Around SS-08 (9/11/2013)	Temporary Screen Interval: 12 ft - 17 ft	--
QMCM-GW19	5/17/2017	QMCM-GW19 10'-15'	1705197	-88.458382864	47.146580868	Around SS-08 (9/11/2013)	Temporary Screen Interval: 10 ft - 15 ft	--
QMCM-GW20	5/18/2017	QMCM-GW20 10-15'	1705197	-88.458389528	47.146244883	Around SS-07 (9/11/2013)	Temporary Screen Interval: 10 ft - 15 ft	--
QMCM-GW21	5/18/2017	QMCM-GW21 10-15'	1705257	-88.458595530	47.146194051	Around SS-07 (9/11/2013)	Temporary Screen Interval: 10 ft - 15 ft	--
QMCM-GW22	5/18/2017	QMCM-GW22 10-15'	1705197	-88.458302887	47.146093120	Around SS-07 (9/11/2013)	Temporary Screen Interval: 10 ft - 15 ft	--
QMCM-GW23	5/18/2017	QMCM-GW23 10-15'	1705197	-88.458494814	47.146053295	Around SS-07 (9/11/2013)	Temporary Screen Interval: 10 ft - 15 ft	--
QMCM-ASBBLK22A	5/26/2017	QMCM-ASBBLK22A-052517	240-80281-1	-88.458824013	47.146586019	SACM (Observation #51)	yellow fire bricks	non-friable
QMCM-ASBBLK22B	5/26/2017	QMCM-ASBBLK22B-052517	240-80281-1	-88.458824013	47.146586019	SACM (Observation #51)	yellow fire bricks	non-friable
QMCM-ASBBLK22C	5/26/2017	QMCM-ASBBLK22C-052517	240-80281-1	-88.458824013	47.146586019	SACM (Observation #51)	yellow fire bricks	non-friable

TABLE 3-2
Sampling and Analysis Summary
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Proposed Sampling Location	Sample Date	Field Sample Identification	Sample Notes	Sampling Method	Sample Type/Matrix: Surface Soil	Subsurface Soil	Groundwater	Surface Water	Sediment	Drums, Containers, and Building Materials/SACM	Requested Laboratory Analyses: VOCs	SVOCs	PCBs	Metals	Cyanide	Asbestos	Waste Characterization	Water Quality Parameters: Temperature (C°)	Conductivity (mS/cm)	Dissolved Oxygen (%)	pH	Turbidity (nTu)	Duplicate Analyses: VOCs	SVOCs	PCBs	Metals	Cyanide	Asbestos	Waste Characterization
Quincy Stamp Mills (continued)																													
QMCM-SB20	5/18/2017	QMCM-SB20 0"-6"		Direct Push Boring	X						X	X		X															
	5/18/2017	QMCM-SB20 6"-4'		Direct Push Boring		X					X	X		X															
QMCM-SB21	5/18/2017	QMCM-SB21 0"-6"		Direct Push Boring	X						X	X		X		X												X	
	5/18/2017	QMCM-SB21 6"-6'		Direct Push Boring		X					X	X		X															
QMCM-SB22	5/18/2017	QMCM-SB22 12"-18"		Direct Push Boring	X						X	X		X															
	5/18/2017	QMCM-SB22 18"-4'		Direct Push Boring		X					X	X		X															
QMCM-SB23	5/18/2017	QMCM-SB23 6"-12"		Direct Push Boring	X						X	X		X															
	5/18/2017	QMCM-SB23 12"-6'		Direct Push Boring		X					X	X		X															
QMCM-SB39	9/17/2017	QMCM-SB39 6"-12"		Direct Push Boring	X						X	X																	
	9/17/2017	QMCM-SB39 12"-4'		Direct Push Boring		X					X	X																	
QMCM-SB40	9/17/2017	QMCM-SB40 6"-12"		Direct Push Boring	X						X	X																	
	9/17/2017	QMCM-SB40 12"-24"		Direct Push Boring		X					X	X																	
QMCM-SB41	9/17/2017	QMCM-SB41 6"-12"		Direct Push Boring	X						X	X																	
	9/17/2017	QMCM-SB41 12"-3'		Direct Push Boring		X					X	X																	
QMCM-SB42	9/17/2017	QMCM-SB42 6"-12"		Direct Push Boring	X						X	X																	
	9/17/2017	QMCM-SB42 12"-24"		Direct Push Boring		X					X	X																	
QMCM-SD47	6/9/2017	QMCM-SD47 0-2'		Vibracore Sampler					X		X	X	X	X															
QMCM-SW08	6/9/2017	QMCM-SW08	VOC analysis omitted	Peristaltic Pump				X				X	X	X				24.6	0.124	105	7.19	NM							
QMCM-GW01	5/17/2017	QMCM-GW01 12-14'		Peristaltic Pump			X				X	X	X	X				8.4	0.369	32.7	7.47	NM							
QMCM-GW02	5/17/2017	QMCM-GW02 10-12'		Peristaltic Pump			X				X	X	X	X				11.1	0.301	88	7.43	NM							
QMCM-GW03	5/17/2017	QMCM-GW03 10-12'		Peristaltic Pump			X				X	X	X	X				11.8	0.316	65	7.27	NM							
QMCM-GW04	5/17/2017	QMCM-GW04 8-10'		Peristaltic Pump			X				X	X	X	X				9.9	0.269	1.8	6.96	NM							
QMCM-GW05	5/16/2017	QMCM-GW05 a-b'	Sample not collected, no groundwater	Peristaltic Pump			X											NA	NA	NA	NA	NM							
QMCM-GW06	5/16/2017	QMCM-GW06 a-b'	Sample not collected, no groundwater	Peristaltic Pump			X											NA	NA	NA	NA	NM							
QMCM-GW07	5/16/2017	QMCM-GW07 a-b'	Sample not collected, no groundwater	Peristaltic Pump			X											NA	NA	NA	NA	NM							
QMCM-GW08	5/16/2017	QMCM-GW08 a-b'	Sample not collected, no groundwater	Peristaltic Pump			X											NA	NA	NA	NA	NM							
QMCM-GW10	5/16/2017	QMCM-GW10 a-b'	Sample not collected, no groundwater	Peristaltic Pump			X											NA	NA	NA	NA	NM							
QMCM-GW12	5/17/2017	QMCM-GW12 8'-13'		Peristaltic Pump			X				X	X		X				6.8	0.26	2.2	6.84	NM							
QMCM-GW13	5/17/2017	QMCM-GW13 8-13'		Peristaltic Pump			X				X	X		X				8	0.269	70.6	6.88	NM							
QMCM-GW14	5/17/2017	QMCM-GW14 8'-13'		Peristaltic Pump			X				X	X		X				7	0.169	2.6	7.02	NM							
QMCM-GW15	5/17/2017	QMCM-GW15 8'-13'	Duplicate added	Peristaltic Pump			X				X	X		X				7	0.218	2.5	6.77	NM	X	X		X			
QMCM-GW16	5/17/2017	QMCM-GW16 10'-15'		Peristaltic Pump			X				X	X		X				7	0.456	54	6.7	NM							
QMCM-GW17	5/18/2017	QMCM-GW17 10-15'		Peristaltic Pump			X				X	X		X				6.5	0.325	69.8	7.06	NM							
QMCM-GW18	5/18/2017	QMCM-GW18 12-17'		Peristaltic Pump			X				X	X		X				6.5	0.273	3.6	6.89	NM							
QMCM-GW19	5/17/2017	QMCM-GW19 10'-15'	Duplicate omitted	Peristaltic Pump			X				X	X		X				7.3	0.396	8.8	6.81	NM							
QMCM-GW20	5/18/2017	QMCM-GW20 10-15'		Peristaltic Pump			X				X	X		X				6.2	0.313	2	6.86	NM							
QMCM-GW21	5/18/2017	QMCM-GW21 10-15'		Peristaltic Pump			X				X	X		X				7.2	0.369	91	7.58	NM							
QMCM-GW22	5/18/2017	QMCM-GW22 10-15'		Peristaltic Pump			X				X	X		X				6.5	0.195	17.7	6.2	NM							
QMCM-GW23	5/18/2017	QMCM-GW23 10-15'		Peristaltic Pump			X				X	X		X				6.6	0.216	66.8	6.72	NM							
QMCM-ASBBLK22A	5/26/2017	QMCM-ASBBLK22A-052517	1000CF	Hand Tools						X						X													
QMCM-ASBBLK22B	5/26/2017	QMCM-ASBBLK22B-052517		Hand Tools						X						X													
QMCM-ASBBLK22C	5/26/2017	QMCM-ASBBLK22C-052517		Hand Tools						X						X													

TABLE 3-2
Sampling and Analysis Summary
Quincy Mining Company Mason 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
Quincy Stamp Mills (continued)								
QMCM-ASBBLK23A	5/26/2017	QMCM-ASBBLK23A-052517	240-80281-1	-88.458824013	47.146586019	SACM (Observation #51)	rope gasket	friable
QMCM-ASBBLK23B	5/26/2017	QMCM-ASBBLK23B-052517	240-80281-1	-88.458824013	47.146586019	SACM (Observation #51)	rope gasket	friable
QMCM-ASBBLK23C	5/26/2017	QMCM-ASBBLK23C-052517	240-80281-1	-88.458824013	47.146586019	SACM (Observation #51)	rope gasket	friable
QMCM-ASBBLK24A	5/26/2017	QMCM-ASBBLK24A-052517	240-80281-1	-88.458503269	47.146272636	SACM (Observation #50)	silo shingle	non-friable
QMCM-ASBBLK24B	5/26/2017	QMCM-ASBBLK24B-052517	240-80281-1	-88.458503269	47.146272636	SACM (Observation #50)	silo shingle	non-friable
QMCM-ASBBLK24C	5/26/2017	QMCM-ASBBLK24C-052517	240-80281-1	-88.458503269	47.146272636	SACM (Observation #50)	silo shingle	non-friable
QMCM-ASBBLK25A	5/26/2017	QMCM-ASBBLK25A-052517	240-80281-1	-88.458503269	47.146272636	SACM (Observation #50)	gray mastic on silo shingle	friable
QMCM-ASBBLK25B	5/26/2017	QMCM-ASBBLK25B-052517	240-80281-1	-88.458503269	47.146272636	SACM (Observation #50)	gray mastic on silo shingle	friable
QMCM-ASBBLK25C	5/26/2017	QMCM-ASBBLK25C-052517	240-80281-1	-88.458503269	47.146272636	SACM (Observation #50)	gray mastic on silo shingle	friable
QMCM-ASBBLK26A	5/26/2017	QMCM-ASBBLK26A-052517	240-80281-1	-88.458427186	47.146234122	SACM (Observation #49)	rubber coated fibrous belt, black	non-friable
QMCM-ASBBLK26B	5/26/2017	QMCM-ASBBLK26B-052517	240-80281-1	-88.458427186	47.146234122	SACM (Observation #49)	rubber coated fibrous belt, black	non-friable
QMCM-ASBBLK26C	5/26/2017	QMCM-ASBBLK26C-052517	240-80281-1	-88.458427186	47.146234122	SACM (Observation #49)	rubber coated fibrous belt, black	non-friable
QMCM-ASBBLK27A	5/26/2017	QMCM-ASBBLK27A-052517	240-80281-1	-88.458427186	47.146234122	SACM (Observation #49)	gray gasket	non-friable
QMCM-ASBBLK28A	5/26/2017	QMCM-ASBBLK28A-052517	240-80281-1	-88.457383048	47.145882467	SACM (Observation #53)	felt roofing w/ mastic	non-friable
QMCM-ASBBLK28B	5/26/2017	QMCM-ASBBLK28B-052517	240-80281-1	-88.457383048	47.145882467	SACM (Observation #53)	felt roofing w/ mastic	non-friable
QMCM-ASBBLK28C	5/26/2017	QMCM-ASBBLK28C-052517	240-80281-1	-88.457383048	47.145882467	SACM (Observation #53)	felt roofing w/ mastic	non-friable
QMCM-ASBBLK29A	5/26/2017	QMCM-ASBBLK29A-052517	240-80281-1	-88.458325536	47.146302343	SACM (Observation #48)	black tar roofing	non-friable
QMCM-ASBBLK29B	5/26/2017	QMCM-ASBBLK29B-052517	240-80281-1	-88.458325536	47.146302343	SACM (Observation #48)	black tar roofing	non-friable
QMCM-ASBBLK29C	5/26/2017	QMCM-ASBBLK29C-052517	240-80281-1	-88.458325536	47.146302343	SACM (Observation #48)	black tar roofing	non-friable
QMCM-ASBBLK30A	5/26/2017	QMCM-ASBBLK30A-052517	240-80281-1	-88.458379638	47.146419847	SACM (Observation #47)	rubber coated, woven hose	non-friable
QMCM-ASBBLK30B	5/26/2017	QMCM-ASBBLK30B-052517	240-80281-1	-88.458379638	47.146419847	SACM (Observation #47)	rubber coated, woven hose	non-friable
QMCM-ASBBLK31A	5/26/2017	QMCM-ASBBLK31A-052517	240-80281-1	-88.457571669	47.146866674	SACM (Observation #45)	black/metallic roofing on wooden boat	non-friable
QMCM-ASBBLK31B	5/26/2017	QMCM-ASBBLK31B-052517	240-80281-1	-88.457571669	47.146866674	SACM (Observation #45)	black/metallic roofing on wooden boat	non-friable
QMCM-ASBBLK31C	5/26/2017	QMCM-ASBBLK31C-052517	240-80281-1	-88.457571669	47.146866674	SACM (Observation #45)	black/metallic roofing on wooden boat	non-friable
QMCM-ASBBLK32A	5/26/2017	QMCM-ASBBLK32A-052517	240-80281-1	-88.458060719	47.146998583	SACM (Observation #42)	black tar paper roofing	non-friable
QMCM-ASBBLK32B	5/26/2017	QMCM-ASBBLK32B-052517	240-80281-1	-88.458060719	47.146998583	SACM (Observation #42)	black tar paper roofing	non-friable
QMCM-ASBBLK32C	5/26/2017	QMCM-ASBBLK32C-052517	240-80281-1	-88.457060739	47.146842134	SACM (Observation #42)	black tar paper roofing	non-friable
QMCM-ASBBLK33A	5/26/2017	QMCM-ASBBLK33A-052517	240-80281-1	-88.456976417	47.146832062	SACM	black wire wrap	non-friable
QMCM-ASBBLK34A	5/26/2017	QMCM-ASBBLK34A-052517	240-80281-1	-88.457952977	47.146886735	SACM (Observation #43)	woven layers	non-friable
QMCM-ASBBLK35A	5/26/2017	QMCM-ASBBLK35A-052517	240-80281-1	-88.457854025	47.147713966	SACM (Observation #40)	black layered felt paper roofing	non-friable
QMCM-ASBBLK36A	5/26/2017	QMCM-ASBBLK36A-052517	240-80281-1	-88.456909492	47.148571063	SACM (Observations #39)	conveyor belt	non-friable
QMCM-ASBBLK36B	5/26/2017	QMCM-ASBBLK36B-052517	240-80281-1	-88.457683535	47.147367866	SACM (Observations #41)	conveyor belt	non-friable
QMCM-ASBBLK37A	5/26/2017	QMCM-ASBBLK37A-052517	240-80281-1	-88.456731015	47.148391856	SACM (Observations within DumpArea#1)	gray woven metallic painted fabric tubing	non-friable
QMCM-ASBBLK37B	5/26/2017	QMCM-ASBBLK37B-052517	240-80281-1	-88.456731015	47.148391856	SACM (Observations within DumpArea#1)	gray woven metallic painted fabric tubing	non-friable
QMCM-ASBBLK37C	5/26/2017	QMCM-ASBBLK37C-052517	240-80281-1	-88.456731015	47.148391856	SACM (Observations within DumpArea#1)	gray woven metallic painted fabric tubing	non-friable
QMCM-ASBBLK38A	5/26/2017	QMCM-ASBBLK38A-052517	240-80281-1	-88.456731015	47.148391856	SACM (Observations within DumpArea#1)	white woven screen	non-friable
QMCM-ASBBLK39A	5/26/2017	QMCM-ASBBLK39A-052517	240-80281-1	-88.456731015	47.148391856	SACM (Observations within DumpArea#1)	black tape wrapped hose	non-friable
QMCM-ASBBLK39B	5/26/2017	QMCM-ASBBLK39B-052517	240-80281-1	-88.456731015	47.148391856	SACM (Observations within DumpArea#1)	black tape wrapped hose	non-friable
QMCM-ASBBLK39C	5/26/2017	QMCM-ASBBLK39C-052517	240-80281-1	-88.456731015	47.148391856	SACM (Observations within DumpArea#1)	black tape wrapped hose	non-friable
QMCM-ASBBLK40A	5/26/2017	QMCM-ASBBLK40A-052517	240-80281-1	-88.456731015	47.148391856	SACM (Observations within DumpArea#1)	black linoleum	non-friable
QMCM-ASBBLK41A	5/26/2017	QMCM-ASBBLK41A-052517	240-80281-1	-88.456731015	47.148391856	SACM (Observations within DumpArea#1)	white linoleum	non-friable
QMCM-ASBBLK42A	5/26/2017	QMCM-ASBBLK42A-052517	240-80281-1	-88.457257844	47.148705814	SACM (Observation #38)	white/gray paper-like, layered gasket material	friable
QMCM-ASBBLK42B	5/26/2017	QMCM-ASBBLK42B-052517	240-80281-1	-88.457257844	47.148705814	SACM (Observation #38)	white/gray paper-like, layered gasket material	friable
QMCM-ASBBLK42C	5/26/2017	QMCM-ASBBLK42C-052517	240-80281-1	-88.457257844	47.148705814	SACM (Observation #38)	white/gray paper-like, layered gasket material	friable

TABLE 3-2
Sampling and Analysis Summary
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

					Sample Type/Matrix						Requested Laboratory Analyses							Water Quality Parameters					Duplicate Analyses						
Proposed Sampling Location	Sample Date	Field Sample Identification	Sample Notes	Sampling Method	Surface Soil	Subsurface Soil	Groundwater	Surface Water	Sediment	Drums, Containers, and Building Materials/SACM	VOCs	SVOCs	PCBs	Metals	Cyanide	Asbestos	Waste Characterization	Temperature (C°)	Conductivity (mS/cm)	Dissolved Oxygen (%)	pH	Turbidity (nTu)	VOCs	SVOCs	PCBs	Metals	Cyanide	Asbestos	Waste Characterization
Quincy Stamp Mills (continued)																													
QMCM-ASBBLK23A	5/26/2017	QMCM-ASBBLK23A-052517	2LF, attached to rusted metal flange	Hand Tools						X						X													
QMCM-ASBBLK23B	5/26/2017	QMCM-ASBBLK23B-052517	sample not analyzed due to prior positive series	Hand Tools						X						X													
QMCM-ASBBLK23C	5/26/2017	QMCM-ASBBLK23C-052517	sample not analyzed due to prior positive series	Hand Tools						X						X													
QMCM-ASBBLK24A	5/26/2017	QMCM-ASBBLK24A-052517	90SF	Hand Tools						X						X													
QMCM-ASBBLK24B	5/26/2017	QMCM-ASBBLK24B-052517		Hand Tools						X						X													
QMCM-ASBBLK24C	5/26/2017	QMCM-ASBBLK24C-052517		Hand Tools						X						X													
QMCM-ASBBLK25A	5/26/2017	QMCM-ASBBLK25A-052517	20SF	Hand Tools						X						X													
QMCM-ASBBLK25B	5/26/2017	QMCM-ASBBLK25B-052517	sample not analyzed due to prior positive series	Hand Tools						X						X													
QMCM-ASBBLK25C	5/26/2017	QMCM-ASBBLK25C-052517	sample not analyzed due to prior positive series	Hand Tools						X						X													
QMCM-ASBBLK26A	5/26/2017	QMCM-ASBBLK26A-052517	15SF	Hand Tools						X						X													
QMCM-ASBBLK26B	5/26/2017	QMCM-ASBBLK26B-052517		Hand Tools						X						X													
QMCM-ASBBLK26C	5/26/2017	QMCM-ASBBLK26C-052517		Hand Tools						X						X													
QMCM-ASBBLK27A	5/26/2017	QMCM-ASBBLK27A-052517	3LF	Hand Tools						X						X													
QMCM-ASBBLK28A	5/26/2017	QMCM-ASBBLK28A-052517	25SF	Hand Tools						X						X													
QMCM-ASBBLK28B	5/26/2017	QMCM-ASBBLK28B-052517		Hand Tools						X						X													
QMCM-ASBBLK28C	5/26/2017	QMCM-ASBBLK28C-052517		Hand Tools						X						X													
QMCM-ASBBLK29A	5/26/2017	QMCM-ASBBLK29A-052517	25SF, potentially more buried	Hand Tools						X						X													
QMCM-ASBBLK29B	5/26/2017	QMCM-ASBBLK29B-052517		Hand Tools						X						X													
QMCM-ASBBLK29C	5/26/2017	QMCM-ASBBLK29C-052517		Hand Tools						X						X													
QMCM-ASBBLK30A	5/26/2017	QMCM-ASBBLK30A-052517	10SF	Hand Tools						X						X													
QMCM-ASBBLK30B	5/26/2017	QMCM-ASBBLK30B-052517		Hand Tools						X						X													
QMCM-ASBBLK31A	5/26/2017	QMCM-ASBBLK31A-052517	150SF, attached to wooden boat structure	Hand Tools						X						X													
QMCM-ASBBLK31B	5/26/2017	QMCM-ASBBLK31B-052517		Hand Tools						X						X													
QMCM-ASBBLK31C	5/26/2017	QMCM-ASBBLK31C-052517		Hand Tools						X						X													
QMCM-ASBBLK32A	5/26/2017	QMCM-ASBBLK32A-052517	25SF, potentially more buried	Hand Tools						X						X													
QMCM-ASBBLK32B	5/26/2017	QMCM-ASBBLK32B-052517		Hand Tools						X						X													
QMCM-ASBBLK32C	5/26/2017	QMCM-ASBBLK32C-052517		Hand Tools						X						X													
QMCM-ASBBLK33A	5/26/2017	QMCM-ASBBLK33A-052517	10LF	Hand Tools						X						X													
QMCM-ASBBLK34A	5/26/2017	QMCM-ASBBLK34A-052517	10SF	Hand Tools						X						X													
QMCM-ASBBLK35A	5/26/2017	QMCM-ASBBLK35A-052517	5SF, attached to wooden board near brick wall	Hand Tools						X						X													
QMCM-ASBBLK36A	5/26/2017	QMCM-ASBBLK36A-052517	each tube is approximately 3'x3'	Hand Tools						X						X													
QMCM-ASBBLK36B	5/26/2017	QMCM-ASBBLK36B-052517		Hand Tools						X						X													
QMCM-ASBBLK37A	5/26/2017	QMCM-ASBBLK37A-052517	15LF, potentially more buried	Hand Tools						X						X													
QMCM-ASBBLK37B	5/26/2017	QMCM-ASBBLK37B-052517	sample not analyzed due to prior positive series	Hand Tools						X						X													
QMCM-ASBBLK37C	5/26/2017	QMCM-ASBBLK37C-052517	sample not analyzed due to prior positive series	Hand Tools						X						X													
QMCM-ASBBLK38A	5/26/2017	QMCM-ASBBLK38A-052517	2SF	Hand Tools						X						X													
QMCM-ASBBLK39A	5/26/2017	QMCM-ASBBLK39A-052517	15LF, potentially more buried	Hand Tools						X						X													
QMCM-ASBBLK39B	5/26/2017	QMCM-ASBBLK39B-052517	sample not analyzed due to prior positive series	Hand Tools						X						X													
QMCM-ASBBLK39C	5/26/2017	QMCM-ASBBLK39C-052517	sample not analyzed due to prior positive series	Hand Tools						X						X													
QMCM-ASBBLK40A	5/26/2017	QMCM-ASBBLK40A-052517	5SF, potentially more buried	Hand Tools						X						X													
QMCM-ASBBLK41A	5/26/2017	QMCM-ASBBLK41A-052517	5SF, potentially more buried	Hand Tools						X						X													
QMCM-ASBBLK42A	5/26/2017	QMCM-ASBBLK42A-052517	1SF	Hand Tools						X						X													
QMCM-ASBBLK42B	5/26/2017	QMCM-ASBBLK42B-052517	sample not analyzed due to prior positive series	Hand Tools						X						X													
QMCM-ASBBLK42C	5/26/2017	QMCM-ASBBLK42C-052517	sample not analyzed due to prior positive series	Hand Tools						X						X													

TABLE 3-2
Sampling and Analysis Summary
Quincy Mining Company Mason 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
Quincy Stamp Mills (continued)								
QMCM-ASBBLK43A	5/26/2017	QMCM-ASBBLK43A-052517	240-80281-1	-88.457257844	47.148705814	SACM (Observation #38)	Transite tile	non-friable
QMCM-ASBBLK43B	5/26/2017	QMCM-ASBBLK43B-052517	240-80281-1	-88.457257844	47.148705814	SACM (Observation #38)	Transite tile	non-friable
QMCM-ASBBLK43C	5/26/2017	QMCM-ASBBLK43C-052517	240-80281-1	-88.457257844	47.148705814	SACM (Observation #38)	Transite tile	non-friable
QMCM-ASBBLK44A	5/26/2017	QMCM-ASBBLK44A-052517	240-80281-1	-88.457257844	47.148705814	SACM (Observation #38)	black Transite tile	non-friable
QMCM-ASBBLK44B	5/26/2017	QMCM-ASBBLK44B-052517	240-80281-1	-88.457257844	47.148705814	SACM (Observation #38)	black Transite tile	non-friable
QMCM-ASBBLK44C	5/26/2017	QMCM-ASBBLK44C-052517	240-80281-1	-88.457257844	47.148705814	SACM (Observation #38)	black Transite tile	non-friable
QMCM-ASBBLK45A	5/26/2017	QMCM-ASBBLK45A-052517	240-80281-1	-88.459816711	47.144706005	SACM (Observation #54)	silver coated black roofing on shoreline near dredge	friable
QMCM-ASBBLK45B	5/26/2017	QMCM-ASBBLK45B-052517	240-80281-1	-88.459816711	47.144706005	SACM (Observation #54)	silver coated black roofing on shoreline near dredge	friable
QMCM-ASBBLK45C	5/26/2017	QMCM-ASBBLK45C-052517	240-80281-1	-88.459816711	47.144706005	SACM (Observation #54)	silver coated black roofing on shoreline near dredge	friable
QMCM-ASBBLK46A	5/26/2017	QMCM-ASBBLK46A-052517	240-80281-1	-88.462744205	47.142414701	SACM (Observation #79)	black gasket	non-friable
QMCM-ASBBLK47A	5/26/2017	QMCM-ASBBLK47A-052517	240-80281-1	-88.462744205	47.142414701	SACM (Observation #79)	black rubber coated fabric tubing	non-friable
QMCM-ASBBLK47B	5/26/2017	QMCM-ASBBLK47B-052517	240-80281-1	-88.462744205	47.142414701	SACM (Observation #79)	black rubber coated fabric tubing	non-friable
QMCM-ASBBLK47C	5/26/2017	QMCM-ASBBLK47C-052517	240-80281-1	-88.462744205	47.142414701	SACM (Observation #79)	black rubber coated fabric tubing	non-friable
QMCM-ASBBLK48A	5/26/2017	QMCM-ASBBLK48A-052517	240-80281-1	-88.462744205	47.142414701	SACM (Observation #79)	gray woven fabric	non-friable
QMCM-ASBBLK48B	5/26/2017	QMCM-ASBBLK48B-052517	240-80281-1	-88.462744205	47.142414701	SACM (Observation #79)	gray woven fabric	non-friable
QMCM-ASBBLK48C	5/26/2017	QMCM-ASBBLK48C-052517	240-80281-1	-88.462744205	47.142414701	SACM (Observation #79)	gray woven fabric	non-friable
QMCM-ASBBLK49A	5/26/2017	QMCM-ASBBLK49A-052517	240-80281-1	-88.462744205	47.142414701	SACM (Observation #79)	coated fabric gasket	non-friable
QMCM-ASBBLK50A	5/26/2017	QMCM-ASBBLK50A-052517	240-80281-1	-88.462744205	47.142414701	SACM (Observation #79)	layered red/gray belting	non-friable
QMCM-ASBBLK51A	5/26/2017	QMCM-ASBBLK51A-052517	240-80281-1	-88.464389907	47.140829304	SACM (Observation #80)	asphaltic roofing	non-friable
QMCM-ASBBLK51B	5/26/2017	QMCM-ASBBLK51B-052517	240-80281-1	-88.464389907	47.140829304	SACM (Observation #80)	asphaltic roofing	non-friable
QMCM-ASBBLK51C	5/26/2017	QMCM-ASBBLK51C-052517	240-80281-1	-88.464389907	47.140829304	SACM (Observation #80)	asphaltic roofing	non-friable
QMCM-ASBBLK52A	5/26/2017	QMCM-ASBBLK52A-052517	240-80281-1	-88.465991728	47.139826643	SACM (Observation #82)	black felt paper roofing	non-friable
QMCM-ASBBLK52B	5/26/2017	QMCM-ASBBLK52B-052517	240-80281-1	-88.465991728	47.139826643	SACM (Observation #82)	black felt paper roofing	non-friable
QMCM-ASBBLK52C	5/26/2017	QMCM-ASBBLK52C-052517	240-80281-1	-88.465991728	47.139826643	SACM (Observation #82)	black felt paper roofing	non-friable
QMCM-ASBBLK53A	5/26/2017	QMCM-ASBBLK53A-052517	240-80281-1	-88.466936538	47.139005143	SACM (Observation #84)	felt paper w/ silver paint	friable
QMCM-ASBBLK53B	5/26/2017	QMCM-ASBBLK53B-052517	240-80281-1	-88.466936538	47.139005143	SACM (Observation #84)	felt paper w/ silver paint	friable
QMCM-ASBBLK53C	5/26/2017	QMCM-ASBBLK53C-052517	240-80281-1	-88.466936538	47.139005143	SACM (Observation #84)	felt paper w/ silver paint	friable
QMCM-ASBBLK54A	5/26/2017	QMCM-ASBBLK54A-052517	240-80281-1	-88.466936538	47.139005143	SACM (Observation #84)	green floral floor tile w/ felt paper	non-friable
QMCM-ASBBLK55A	5/26/2017	QMCM-ASBBLK55A-052517	240-80281-1	-88.466936538	47.139005143	SACM (Observation #84)	green patterned floor tile w/ felt paper	non-friable
QMCM-ASBBLK56A	5/26/2017	QMCM-ASBBLK56A-052517	240-80281-1	-88.466936538	47.139005143	SACM (Observation #84)	red patterned floor tile w/ felt paper	non-friable
QMCM-ASBBLK57A	5/26/2017	QMCM-ASBBLK57A-052517	240-80281-1	-88.466936538	47.139005143	SACM (Observation #84)	pink layered floor tile w/ felt paper	non-friable
QMCM-ASBBLK58A	5/26/2017	QMCM-ASBBLK58A-052517	240-80281-1	-88.459726602	47.146825146	SACM (Observation #35)	black asphaltic tar roofing	non-friable
QMCM-ASBBLK58B	5/26/2017	QMCM-ASBBLK58B-052517	240-80281-1	-88.459726602	47.146825146	SACM (Observation #35)	black asphaltic tar roofing	non-friable
QMCM-ASBBLK58C	5/26/2017	QMCM-ASBBLK58C-052517	240-80281-1	-88.459726602	47.146825146	SACM (Observation #35)	black asphaltic tar roofing	non-friable
QMCM-ASBBLK59A	5/26/2017	QMCM-ASBBLK59A-052517	240-80281-1	-88.459880514	47.147102728	SACM (Observation #34)	black tar/felt paper roofing w/specks, weathered and nailed to board	friable
QMCM-ASBBLK59B	5/26/2017	QMCM-ASBBLK59B-052517	240-80281-1	-88.459880514	47.147102728	SACM (Observation #34)	black tar/felt paper roofing w/specks, weathered and nailed to board	friable
QMCM-ASBBLK59C	5/26/2017	QMCM-ASBBLK59C-052517	240-80281-1	-88.459880514	47.147102728	SACM (Observation #34)	black tar/felt paper roofing w/specks, weathered and nailed to board	friable
QMCM-ASBBLK60A	5/26/2017	QMCM-ASBBLK60A-052517	240-80281-1	-88.460583840	47.147068151	SACM (Observations #27)	suspect TSI material, coloring varies, mostly dark gray/white	friable
QMCM-ASBBLK60B	5/26/2017	QMCM-ASBBLK60B-052517	240-80281-1	-88.460754615	47.146753298	SACM (Observations #29)	suspect TSI material, coloring varies, mostly dark gray/white	friable
QMCM-ASBBLK60C	5/26/2017	QMCM-ASBBLK60C-052517	240-80281-1	-88.460354605	47.146869574	SACM (Observations #31)	suspect TSI material, coloring varies, mostly dark gray/white	friable
QMCM-ASBBLK61A	5/26/2017	QMCM-ASBBLK61A-052517	240-80281-1	-88.460454647	47.146974324	SACM (Observation #33)	woven material w/ yellow paint coating	non-friable
QMCM-ASBBLK62A	5/26/2017	QMCM-ASBBLK62A-052517	240-80281-1	-88.460529540	47.146727429	SACM (Observation #30)	red/black woven fabric w/ white strip	non-friable
QMCM-ASBBLK62B	5/26/2017	QMCM-ASBBLK62B-052517	240-80281-1	-88.460529540	47.146727429	SACM (Observation #30)	red/black woven fabric w/ white strip	non-friable
QMCM-ASBBLK62C	5/26/2017	QMCM-ASBBLK62C-052517	240-80281-1	-88.460529540	47.146727429	SACM (Observation #30)	red/black woven fabric w/ white strip	non-friable

TABLE 3-2
Sampling and Analysis Summary
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

					Sample Type/Matrix						Requested Laboratory Analyses							Water Quality Parameters					Duplicate Analyses						
Proposed Sampling Location	Sample Date	Field Sample Identification	Sample Notes	Sampling Method	Surface Soil	Subsurface Soil	Groundwater	Surface Water	Sediment	Drums, Containers, and Building Materials/SACM	VOCs	SVOCs	PCBs	Metals	Cyanide	Asbestos	Waste Characterization	Temperature (C°)	Conductivity (mS/cm)	Dissolved Oxygen (%)	pH	Turbidity (nTu)	VOCs	SVOCs	PCBs	Metals	Cyanide	Asbestos	Waste Characterization
Quincy Stamp Mills (continued)																													
QMCM-ASBBLK43A	5/26/2017	QMCM-ASBBLK43A-052517	5SF, scattered pieces	Hand Tools						X						X													
QMCM-ASBBLK43B	5/26/2017	QMCM-ASBBLK43B-052517	sample not analyzed due to prior positive series	Hand Tools						X						X													
QMCM-ASBBLK43C	5/26/2017	QMCM-ASBBLK43C-052517	sample not analyzed due to prior positive series	Hand Tools						X						X													
QMCM-ASBBLK44A	5/26/2017	QMCM-ASBBLK44A-052517	2SF, scattered pieces	Hand Tools						X						X													
QMCM-ASBBLK44B	5/26/2017	QMCM-ASBBLK44B-052517		Hand Tools						X						X													
QMCM-ASBBLK44C	5/26/2017	QMCM-ASBBLK44C-052517		Hand Tools						X						X													
QMCM-ASBBLK45A	5/26/2017	QMCM-ASBBLK45A-052517	10SF, scattered along shoreline	Hand Tools						X						X													
QMCM-ASBBLK45B	5/26/2017	QMCM-ASBBLK45B-052517	sample not analyzed due to prior positive series	Hand Tools						X						X													
QMCM-ASBBLK45C	5/26/2017	QMCM-ASBBLK45C-052517	sample not analyzed due to prior positive series	Hand Tools						X						X													
QMCM-ASBBLK46A	5/26/2017	QMCM-ASBBLK46A-052517	1SF	Hand Tools						X						X													
QMCM-ASBBLK47A	5/26/2017	QMCM-ASBBLK47A-052517	10LF	Hand Tools						X						X													
QMCM-ASBBLK47B	5/26/2017	QMCM-ASBBLK47B-052517		Hand Tools						X						X													
QMCM-ASBBLK47C	5/26/2017	QMCM-ASBBLK47C-052517		Hand Tools						X						X													
QMCM-ASBBLK48A	5/26/2017	QMCM-ASBBLK48A-052517	15SF	Hand Tools						X						X													
QMCM-ASBBLK48B	5/26/2017	QMCM-ASBBLK48B-052517		Hand Tools						X						X													
QMCM-ASBBLK48C	5/26/2017	QMCM-ASBBLK48C-052517		Hand Tools						X						X													
QMCM-ASBBLK49A	5/26/2017	QMCM-ASBBLK49A-052517	1SF	Hand Tools						X						X													
QMCM-ASBBLK50A	5/26/2017	QMCM-ASBBLK50A-052517	1SF	Hand Tools						X						X													
QMCM-ASBBLK51A	5/26/2017	QMCM-ASBBLK51A-052517	20SF	Hand Tools						X						X													
QMCM-ASBBLK51B	5/26/2017	QMCM-ASBBLK51B-052517		Hand Tools						X						X													
QMCM-ASBBLK51C	5/26/2017	QMCM-ASBBLK51C-052517		Hand Tools						X						X													
QMCM-ASBBLK52A	5/26/2017	QMCM-ASBBLK52A-052517	25SF	Hand Tools						X						X													
QMCM-ASBBLK52B	5/26/2017	QMCM-ASBBLK52B-052517		Hand Tools						X						X													
QMCM-ASBBLK52C	5/26/2017	QMCM-ASBBLK52C-052517		Hand Tools						X						X													
QMCM-ASBBLK53A	5/26/2017	QMCM-ASBBLK53A-052517	15SF, potentially more buried	Hand Tools						X						X													
QMCM-ASBBLK53B	5/26/2017	QMCM-ASBBLK53B-052517	sample not analyzed due to prior positive series	Hand Tools						X						X													
QMCM-ASBBLK53C	5/26/2017	QMCM-ASBBLK53C-052517	sample not analyzed due to prior positive series	Hand Tools						X						X													
QMCM-ASBBLK54A	5/26/2017	QMCM-ASBBLK54A-052517	10SF	Hand Tools						X						X													
QMCM-ASBBLK55A	5/26/2017	QMCM-ASBBLK55A-052517	10SF	Hand Tools						X						X													
QMCM-ASBBLK56A	5/26/2017	QMCM-ASBBLK56A-052517	10SF	Hand Tools						X						X													
QMCM-ASBBLK57A	5/26/2017	QMCM-ASBBLK57A-052517	10SF	Hand Tools						X						X													
QMCM-ASBBLK58A	5/26/2017	QMCM-ASBBLK58A-052517	50SF, scattered near M-26	Hand Tools						X						X													
QMCM-ASBBLK58B	5/26/2017	QMCM-ASBBLK58B-052517		Hand Tools						X						X													
QMCM-ASBBLK58C	5/26/2017	QMCM-ASBBLK58C-052517		Hand Tools						X						X													
QMCM-ASBBLK59A	5/26/2017	QMCM-ASBBLK59A-052517	25SF, nailed to board, potentially more buried	Hand Tools						X						X													
QMCM-ASBBLK59B	5/26/2017	QMCM-ASBBLK59B-052517	sample not analyzed due to prior positive series	Hand Tools						X						X													
QMCM-ASBBLK59C	5/26/2017	QMCM-ASBBLK59C-052517	sample not analyzed due to prior positive series	Hand Tools						X						X													
QMCM-ASBBLK60A	5/26/2017	QMCM-ASBBLK60A-052517	scattered piles within area totaling 6000SF	Hand Tools						X						X													
QMCM-ASBBLK60B	5/26/2017	QMCM-ASBBLK60B-052517	sample not analyzed due to prior positive series	Hand Tools						X						X													
QMCM-ASBBLK60C	5/26/2017	QMCM-ASBBLK60C-052517	sample not analyzed due to prior positive series	Hand Tools						X						X													
QMCM-ASBBLK61A	5/26/2017	QMCM-ASBBLK61A-052517	3SF	Hand Tools						X						X													
QMCM-ASBBLK62A	5/26/2017	QMCM-ASBBLK62A-052517	20LF	Hand Tools						X						X													
QMCM-ASBBLK62B	5/26/2017	QMCM-ASBBLK62B-052517		Hand Tools						X						X													
QMCM-ASBBLK62C	5/26/2017	QMCM-ASBBLK62C-052517		Hand Tools						X						X													

TABLE 3-2
Sampling and Analysis Summary
Quincy Mining Company Mason 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
Quincy Stamp Mills (continued)								
QMCM-ASBBLK63A	5/26/2017	QMCM-ASBBLK63A-052517	240-80281-1	-88.460495103	47.146781189	SACM (Observation #32)	layered gray woven fabric, in sheets	non-friable
QMCM-ASBBLK63B	5/26/2017	QMCM-ASBBLK63B-052517	240-80281-1	-88.460495103	47.146781189	SACM (Observation #32)	layered gray woven fabric, in sheets	non-friable
QMCM-ASBBLK63C	5/26/2017	QMCM-ASBBLK63C-052517	240-80281-1	-88.460495103	47.146781189	SACM (Observation #32)	layered gray woven fabric, in sheets	non-friable
QMCM-ASBBLK64A	5/26/2017	QMCM-ASBBLK64A-052517	240-80281-1	-88.460471316	47.147409870	SACM (Observation #28)	suspect fire door TSI material	friable
QMCM-ASBBLK64B	5/26/2017	QMCM-ASBBLK64B-052517	240-80281-1	-88.460471316	47.147409870	SACM (Observation #28)	suspect fire door TSI material	friable
QMCM-ASBBLK64C	5/26/2017	QMCM-ASBBLK64C-052517	240-80281-1	-88.460471316	47.147409870	SACM (Observation #28)	suspect fire door TSI material	friable
QMCM-ASBBLK65A	5/26/2017	QMCM-ASBBLK65A-052517	240-80281-1	-88.461213326	47.146654602	SACM (Observation #25)	black/gray asphalt shingles	non-friable
QMCM-ASBBLK65B	5/26/2017	QMCM-ASBBLK65B-052517	240-80281-1	-88.461213326	47.146654602	SACM (Observation #25)	black/gray asphalt shingles	non-friable
QMCM-ASBBLK65C	5/26/2017	QMCM-ASBBLK65C-052517	240-80281-1	-88.461213326	47.146654602	SACM (Observation #25)	black/gray asphalt shingles	non-friable
QMCM-ASBBLK66A	5/26/2017	QMCM-ASBBLK66A-052517	240-80281-1	-88.461133230	47.146548449	SACM (Observation #37)	white weathered woven belting	non-friable
QMCM-ASBBLK67A	5/26/2017	QMCM-ASBBLK67A-052617	240-80281-1	-88.460438145	47.147533550	SACM (Observation #23)	gray/white window glazing	non-friable
QMCM-ASBBLK67B	5/26/2017	QMCM-ASBBLK67B-052617	240-80281-1	-88.460438145	47.147533550	SACM (Observation #23)	gray/white window glazing	non-friable
QMCM-ASBBLK67C	5/26/2017	QMCM-ASBBLK67C-052617	240-80281-1	-88.460438145	47.147533550	SACM (Observation #23)	gray/white window glazing	non-friable
QMCM-ASBBLK68A	5/26/2017	QMCM-ASBBLK68A-052617	240-80281-1	-88.460190051	47.147709742	SACM (Observation #21)	slate sheeting	non-friable
QMCM-ASBBLK68B	5/26/2017	QMCM-ASBBLK68B-052617	240-80281-1	-88.460190051	47.147709742	SACM (Observation #21)	slate sheeting	non-friable
QMCM-ASBBLK68C	5/26/2017	QMCM-ASBBLK68C-052617	240-80281-1	-88.460190051	47.147709742	SACM (Observation #21)	slate sheeting	non-friable
QMCM-ASBBLK69A	5/26/2017	QMCM-ASBBLK69A-052617	240-80281-1	-88.460401999	47.147693275	SACM (Observation #24)	black fabric tubing	non-friable
QMCM-ASBBLK69B	5/26/2017	QMCM-ASBBLK69B-052617	240-80281-1	-88.460401999	47.147693275	SACM (Observation #24)	black fabric tubing	non-friable
QMCM-ASBBLK69C	5/26/2017	QMCM-ASBBLK69C-052617	240-80281-1	-88.460401999	47.147693275	SACM (Observation #24)	black fabric tubing	non-friable
QMCM-ASBBLK70A	5/26/2017	QMCM-ASBBLK70A-052617	240-80281-1	-88.459900822	47.147550311	SACM (Observation #22)	white/gray woven fabric material with visibly weathered black coating	friable
QMCM-ASBBLK71A	5/26/2017	QMCM-ASBBLK71A-052617	240-80281-1	-88.459051868	47.148968865	SACM (Observation #14)	black foundation mastic	non-friable
QMCM-ASBBLK71B	5/26/2017	QMCM-ASBBLK71B-052617	240-80281-1	-88.459051868	47.148968865	SACM (Observation #14)	black foundation mastic	non-friable
QMCM-ASBBLK71C	5/26/2017	QMCM-ASBBLK71C-052617	240-80281-1	-88.459051868	47.148968865	SACM (Observation #14)	black foundation mastic	non-friable
QMCM-ASBBLK72A	5/26/2017	QMCM-ASBBLK72A-052617	240-80281-1	-88.459062066	47.148920280	SACM (Observation #12)	tar mastic, loose in blocky fist-sized chunks	non-friable
QMCM-ASBBLK72B	5/26/2017	QMCM-ASBBLK72B-052617	240-80281-1	-88.459062066	47.148920280	SACM (Observation #12)	tar mastic, loose in blocky fist-sized chunks	non-friable
QMCM-ASBBLK72C	5/26/2017	QMCM-ASBBLK72C-052617	240-80281-1	-88.459062066	47.148920280	SACM (Observation #12)	tar mastic, loose in blocky fist-sized chunks	non-friable
QMCM-ASBBLK73A	5/26/2017	QMCM-ASBBLK73A052617	240-80281-1	-88.459158415	47.148951965	SACM (Observation #19)	gray woven material	non-friable
QMCM-ASBBLK73B	5/26/2017	QMCM-ASBBLK73B-052617	240-80281-1	-88.459158415	47.148951965	SACM (Observation #19)	gray woven material	non-friable
QMCM-ASBBLK73C	5/26/2017	QMCM-ASBBLK73C-052617	240-80281-1	-88.458816318	47.148951223	SACM (Observation #19)	gray woven material	non-friable
QMCM-ASBBLK74A	5/26/2017	QMCM-ASBBLK74A-052617	240-80281-1	-88.459247512	47.149041147	SACM (Observation #17)	suspect TSI material, coloring varies, mostly beige/cream	friable
QMCM-ASBBLK74B	5/26/2017	QMCM-ASBBLK74B-052617	240-80281-1	-88.459247512	47.149041147	SACM (Observation #17)	suspect TSI material, coloring varies, mostly beige/cream	friable
QMCM-ASBBLK74C	5/26/2017	QMCM-ASBBLK74C-052617	240-80281-1	-88.459247512	47.149041147	SACM (Observation #17)	suspect TSI material, coloring varies, mostly beige/cream	friable
QMCM-ASBBLK75A	5/26/2017	QMCM-ASBBLK75A-052617	240-80281-1	-88.459174972	47.148944986	SACM (Observation #18)	suspect TSI fibrous material, gray/black	friable
QMCM-ASBBLK75B	5/26/2017	QMCM-ASBBLK75B-052617	240-80281-1	-88.459174972	47.148944986	SACM (Observation #18)	suspect TSI fibrous material, gray/black	friable
QMCM-ASBBLK75C	5/26/2017	QMCM-ASBBLK75C-052617	240-80281-1	-88.459174972	47.148944986	SACM (Observation #18)	suspect TSI fibrous material, gray/black	friable
QMCM-ASBBLK76A	5/26/2017	QMCM-ASBBLK76A-052617	240-80281-1	-88.459035230	47.148988462	SACM (Observation #15)	black mesh imprint felt paper, some with burlap	friable
QMCM-ASBBLK76B	5/26/2017	QMCM-ASBBLK76B-052617	240-80281-1	-88.459035230	47.148988462	SACM (Observation #15)	black mesh imprint felt paper, some with burlap	friable
QMCM-ASBBLK76C	5/26/2017	QMCM-ASBBLK76C-052617	240-80281-1	-88.459035230	47.148988462	SACM (Observation #15)	black mesh imprint felt paper, some with burlap	friable
QMCM-ASBBLK77A	5/26/2017	QMCM-ASBBLK77A-052617	240-80281-1	-88.459066160	47.149036523	SACM (Observation #16)	red woven fabric	non-friable
QMCM-ASBBLK77B	5/26/2017	QMCM-ASBBLK77B-052617	240-80281-1	-88.459066160	47.149036523	SACM (Observation #16)	red woven fabric	non-friable
QMCM-ASBBLK77C	5/26/2017	QMCM-ASBBLK77C-052617	240-80281-1	-88.459066160	47.149036523	SACM (Observation #16)	red woven fabric	non-friable
QMCM-ASBBLK78A	5/26/2017	QMCM-ASBBLK78A-052617	240-80281-1	-88.458891690	47.148892486	SACM (Observation #11)	black woven material	non-friable
QMCM-ASBBLK78B	5/26/2017	QMCM-ASBBLK78B-052617	240-80281-1	-88.458891690	47.148892486	SACM (Observation #11)	black woven material	non-friable
QMCM-ASBBLK78C	5/26/2017	QMCM-ASBBLK78C-052617	240-80281-1	-88.458891690	47.148892486	SACM (Observation #11)	black woven material	non-friable

TABLE 3-2
Sampling and Analysis Summary
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

					Sample Type/Matrix						Requested Laboratory Analyses							Water Quality Parameters					Duplicate Analyses						
Proposed Sampling Location	Sample Date	Field Sample Identification	Sample Notes	Sampling Method	Surface Soil	Subsurface Soil	Groundwater	Surface Water	Sediment	Drums, Containers, and Building Materials/SACM	VOCs	SVOCs	PCBs	Metals	Cyanide	Asbestos	Waste Characterization	Temperature (C°)	Conductivity (mS/cm)	Dissolved Oxygen (%)	pH	Turbidity (nTu)	VOCs	SVOCs	PCBs	Metals	Cyanide	Asbestos	Waste Characterization
Quincy Stamp Mills (continued)																													
QMCM-ASBBLK63A	5/26/2017	QMCM-ASBBLK63A-052517	75SF	Hand Tools						X						X													
QMCM-ASBBLK63B	5/26/2017	QMCM-ASBBLK63B-052517		Hand Tools						X						X													
QMCM-ASBBLK63C	5/26/2017	QMCM-ASBBLK63C-052517		Hand Tools						X						X													
QMCM-ASBBLK64A	5/26/2017	QMCM-ASBBLK64A-052517	40SF	Hand Tools						X						X													
QMCM-ASBBLK64B	5/26/2017	QMCM-ASBBLK64B-052517	sample not analyzed due to prior positive series	Hand Tools						X						X													
QMCM-ASBBLK64C	5/26/2017	QMCM-ASBBLK64C-052517	sample not analyzed due to prior positive series	Hand Tools						X						X													
QMCM-ASBBLK65A	5/26/2017	QMCM-ASBBLK65A-052517	50SF	Hand Tools						X						X													
QMCM-ASBBLK65B	5/26/2017	QMCM-ASBBLK65B-052517		Hand Tools						X						X													
QMCM-ASBBLK65C	5/26/2017	QMCM-ASBBLK65C-052517		Hand Tools						X						X													
QMCM-ASBBLK66A	5/26/2017	QMCM-ASBBLK66A-052517	5SF	Hand Tools						X						X													
QMCM-ASBBLK67A	5/26/2017	QMCM-ASBBLK67A-052617	20LF	Hand Tools						X						X													
QMCM-ASBBLK67B	5/26/2017	QMCM-ASBBLK67B-052617		Hand Tools						X						X													
QMCM-ASBBLK67C	5/26/2017	QMCM-ASBBLK67C-052617		Hand Tools						X						X													
QMCM-ASBBLK68A	5/26/2017	QMCM-ASBBLK68A-052617	5SF, large sheet was not observed after recon activities	Hand Tools						X						X													
QMCM-ASBBLK68B	5/26/2017	QMCM-ASBBLK68B-052617		Hand Tools						X						X													
QMCM-ASBBLK68C	5/26/2017	QMCM-ASBBLK68C-052617		Hand Tools						X						X													
QMCM-ASBBLK69A	5/26/2017	QMCM-ASBBLK69A-052617	5LF, potentially more buried	Hand Tools						X						X													
QMCM-ASBBLK69B	5/26/2017	QMCM-ASBBLK69B-052617		Hand Tools						X						X													
QMCM-ASBBLK69C	5/26/2017	QMCM-ASBBLK69C-052617		Hand Tools						X						X													
QMCM-ASBBLK70A	5/26/2017	QMCM-ASBBLK70A-052617	6SF, potentially more buried	Hand Tools						X						X													
QMCM-ASBBLK71A	5/26/2017	QMCM-ASBBLK71A-052617	5SF	Hand Tools						X						X													
QMCM-ASBBLK71B	5/26/2017	QMCM-ASBBLK71B-052617		Hand Tools						X						X													
QMCM-ASBBLK71C	5/26/2017	QMCM-ASBBLK71C-052617		Hand Tools						X						X													
QMCM-ASBBLK72A	5/26/2017	QMCM-ASBBLK72A-052617	3SF	Hand Tools						X						X													
QMCM-ASBBLK72B	5/26/2017	QMCM-ASBBLK72B-052617		Hand Tools						X						X													
QMCM-ASBBLK72C	5/26/2017	QMCM-ASBBLK72C-052617		Hand Tools						X						X													
QMCM-ASBBLK73A	5/26/2017	QMCM-ASBBLK73A052617	20SF, scattered in area	Hand Tools						X						X													
QMCM-ASBBLK73B	5/26/2017	QMCM-ASBBLK73B-052617		Hand Tools						X						X													
QMCM-ASBBLK73C	5/26/2017	QMCM-ASBBLK73C-052617		Hand Tools						X						X													
QMCM-ASBBLK74A	5/26/2017	QMCM-ASBBLK74A-052617	scattered piles within area totaling 1000SF	Hand Tools						X						X													
QMCM-ASBBLK74B	5/26/2017	QMCM-ASBBLK74B-052617	sample not analyzed due to prior positive series	Hand Tools						X						X													
QMCM-ASBBLK74C	5/26/2017	QMCM-ASBBLK74C-052617	sample not analyzed due to prior positive series	Hand Tools						X						X													
QMCM-ASBBLK75A	5/26/2017	QMCM-ASBBLK75A-052617	3SF	Hand Tools						X						X													
QMCM-ASBBLK75B	5/26/2017	QMCM-ASBBLK75B-052617		Hand Tools						X						X													
QMCM-ASBBLK75C	5/26/2017	QMCM-ASBBLK75C-052617		Hand Tools						X						X													
QMCM-ASBBLK76A	5/26/2017	QMCM-ASBBLK76A-052617	15SF, scattered in area	Hand Tools						X						X													
QMCM-ASBBLK76B	5/26/2017	QMCM-ASBBLK76B-052617	sample not analyzed due to prior positive series	Hand Tools						X						X													
QMCM-ASBBLK76C	5/26/2017	QMCM-ASBBLK76C-052617	sample not analyzed due to prior positive series	Hand Tools						X						X													
QMCM-ASBBLK77A	5/26/2017	QMCM-ASBBLK77A-052617	10SF, scattered in area	Hand Tools						X						X													
QMCM-ASBBLK77B	5/26/2017	QMCM-ASBBLK77B-052617		Hand Tools						X						X													
QMCM-ASBBLK77C	5/26/2017	QMCM-ASBBLK77C-052617		Hand Tools						X						X													
QMCM-ASBBLK78A	5/26/2017	QMCM-ASBBLK78A-052617	5SF	Hand Tools						X						X													
QMCM-ASBBLK78B	5/26/2017	QMCM-ASBBLK78B-052617		Hand Tools						X						X													
QMCM-ASBBLK78C	5/26/2017	QMCM-ASBBLK78C-052617		Hand Tools						X						X													

TABLE 3-2
Sampling and Analysis Summary
Quincy Mining Company Mason 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
Quincy Stamp Mills (continued)								
QMCM-ASBBLK79A	5/26/2017	QMCM-ASBBLK79A-052617	240-80281-1	-88.458891690	47.148892486	SACM (Observation #11)	black mastic w/ fabric	non-friable
QMCM-ASBBLK80A	5/26/2017	QMCM-ASBBLK80A-052617	240-80281-1	-88.459025713	47.149273403	SACM (Observation #1)	layered woven gaskets	non-friable
QMCM-ASBBLK80B	5/26/2017	QMCM-ASBBLK80B-052617	240-80281-1	-88.459025713	47.149273403	SACM (Observation #1)	layered woven gaskets	non-friable
QMCM-ASBBLK80C	5/26/2017	QMCM-ASBBLK80C-052617	240-80281-1	-88.459025713	47.149273403	SACM (Observation #1)	layered woven gaskets	non-friable
QMCM-ASBBLK81A	5/26/2017	QMCM-ASBBLK81A-052617	240-80281-1	-88.459025713	47.149273403	SACM (Observation #1)	gray woven fabric	non-friable
QMCM-ASBBLK82A	5/26/2017	QMCM-ASBBLK82A-052617	240-80281-1	-88.459025713	47.149273403	SACM (Observation #1)	gray/brown woven fabric	non-friable
QMCM-ASBBLK83A	5/26/2017	QMCM-ASBBLK83A-052617	240-80281-1	-88.459025713	47.149273403	SACM (Observation #1)	gray coated felt paper	friable
QMCM-ASBBLK84A	5/26/2017	QMCM-ASBBLK84A-052617	240-80281-1	-88.458531889	47.148899081	SACM (Observation #8)	felt paper roofing, black and layered with tar-substance	friable
QMCM-ASBBLK85A	5/26/2017	QMCM-ASBBLK85A-052617	240-80281-1	-88.458662586	47.148558340	SACM (Observation #7)	yellow firebricks	non-friable
QMCM-ASBBLK85B	5/26/2017	QMCM-ASBBLK85B-052617	240-80281-1	-88.458662586	47.148558340	SACM (Observation #7)	yellow firebricks	non-friable
QMCM-ASBBLK85C	5/26/2017	QMCM-ASBBLK85C-052617	240-80281-1	-88.458662586	47.148558340	SACM (Observation #7)	yellow firebricks	non-friable
QMCM-ASBBLK86A	5/26/2017	QMCM-ASBBLK86A-052617	240-80281-1	-88.458780801	47.148939153	SACM (Observation #10)	black roofing w/ metallic coating, layered with felt paper	non-friable
QMCM-ASBBLK87A	5/26/2017	QMCM-ASBBLK87A-052617	240-80281-1	-88.458869260	47.148506698	SACM (Observation #2)	tar pebble felt paper roofing	friable
QMCM-ASBBLK87B	5/26/2017	QMCM-ASBBLK87B-052617	240-80281-1	-88.458869260	47.148506698	SACM (Observation #2)	tar pebble felt paper roofing	friable
QMCM-ASBBLK87C	5/26/2017	QMCM-ASBBLK87C-052617	240-80281-1	-88.458869260	47.148506698	SACM (Observation #2)	tar pebble felt paper roofing	friable
QMCM-RPM01	5/16/2017	QMCM-RPM01 0"-6"	17051193	-88.459121079	47.148780748	Suspect tailings (Observation #3)	Gray fine-grained sand material with finer silt. Likely tailings.	–
QMCM-RPM04	5/16/2017	QMCM-RPM04 0"-6"	17051193	-88.459025710	47.149273400	Waste deposit	Black tar-like and greasy substance, contains fibrous material, hardened on top where exposed to air, softer underneath	–
QMCM-RPM05	5/16/2017	QMCM-RPM05 0"-6"	17051193	-88.459003130	47.148865930	Suspect processing cake material	Yellow/orange cake-like material in small pieces, found on concrete foundation floor, mixed with soil, gravel, wood debris	–
QMCM-RPM06	5/16/2017	QMCM-RPM06 0"-6"	17051193	-88.460590741	47.146549180	Suspect tailing/sludge material in Mineral House thickener	Brown silty sand with some clay, cohesive, wet	–
QMCM-DM02	5/17/2017	QMCM-DM02 0"-6"	17051193	-88.458267728	47.146352203	Crushed drum with granular, tan substance (Observation: Drum#17)	Medium to coarse grained granular substance, appears sand-like	–
QMCM-DM03	5/17/2017	QMCM-DM03 0"-6"	17051193	-88.458762768	47.146316109	Crushed drum with crystallized, white solid substance (Observation: Drum#19)	White and beige semi-hardened material in gravel sized chunks, cohesive with applied pressure	–
Quincy Reclamation Plant								
QMCM-SS41	5/17/2017	QMCM-SS41 0"-6"	1705193	-88.463358292	47.140855649	Proximal to XRF-10 (2013) location	Dark brown coarse SAND; moist	–
QMCM-SS42	5/17/2017	QMCM-SS42 0"-6"	1705193	-88.463460291	47.140832607	Proximal to XRF-10 (2013) location	Brown to red SAND; moist	–
QMCM-SS43	5/17/2017	QMCM-SS43 0"-6"	1705193	-88.463510980	47.140776186	Proximal to XRF-10 (2013) location	Brown silty SAND; moist	–
QMCM-SS44	5/17/2017	QMCM-SS44 0"-6"	1705194	-88.463373657	47.140753317	Proximal to XRF-10 (2013) location	Brown to red coarse SAND; moist with organics	–
QMCM-SS45	5/17/2017	QMCM-SS45 0"-6"	1705193	-88.464640769	47.140760265	On substation pad	Brown SAND; moist with organics	–
QMCM-SS46	5/17/2017	QMCM-SS46 0"-6"	1705193	-88.464537509	47.140754110	On substation pad	Brown silty SAND; moist	–
QMCM-SB09	5/20/2017	QMCM-SB09 0-6"	1705254	-88.463276430	47.141995620	Petroleum-like odor near drum	TOPSOIL to 6 in	–
	5/20/2017	QMCM-SB09 6"-4'	1705254			Petroleum-like odor near drum	SAND, Fine to medium, gray to 5 ft; saturated at 4 ft	–
QMCM-SB24	5/19/2017	QMCM-SB24 0-6"	1705253	-88.464478974	47.140999910	Near Substation / PCB exceedance (SS-18)	ROAD GRAVEL to 6 in	–
	5/19/2017	QMCM-SB24 6"-4'	1705253			Near Substation / PCB exceedance (SS-18)	SAND, Fine to medium, brown to 5 ft; saturated at 4.5 ft	–
QMCM-SB25	5/19/2017	QMCM-SB25 0-6"	1705253	-88.464599334	47.140953453	Near Substation / PCB exceedance (SS-18)	SILTY SAND, Fine, gray to 1 ft	–
	5/19/2017	QMCM-SB25 6"-4'	1705253			Near Substation / PCB exceedance (SS-18)	SAND, Fine to medium, brown to 5 ft; saturated at 4 ft	–
QMCM-SB26	5/19/2017	QMCM-SB26 0-6"	1705253	-88.464643934	47.140851787	Near Substation / PCB exceedance (SS-18)	SILTY SAND, Fine, gray to 1 ft	–
	5/19/2017	QMCM-SB26 6"-4'	1705253			Near Substation / PCB exceedance (SS-18)	SAND, Fine to medium, brown to 5 ft; saturated at 4.5 ft	–
QMCM-SB27	5/19/2017	QMCM-SB27 0-6"	1705253	-88.464461350	47.140816410	Near Substation / PCB exceedance (SS-18)	SILTY SAND, Fine, gray to 1 ft	–
	5/19/2017	QMCM-SB27 6"-4'	1705253			Near Substation / PCB exceedance (SS-18)	SAND, Fine to medium, brown to 5 ft; saturated at 4.5 ft	–
QMCM-SB28	5/19/2017	QMCM-SB28 0-6"	1705253	-88.464302648	47.140828164	Near Substation / PCB exceedance (SS-18)	SILTY SAND, Fine, gray to 1 ft	–
	5/19/2017	QMCM-SB28 6"-4"	1705253			Near Substation / PCB exceedance (SS-18)	SAND, Fine to medium, brown to 5ft; saturated at 4.5 ft	–

TABLE 3-2
Sampling and Analysis Summary
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

					Sample Type/Matrix						Requested Laboratory Analyses							Water Quality Parameters					Duplicate Analyses						
Proposed Sampling Location	Sample Date	Field Sample Identification	Sample Notes	Sampling Method	Surface Soil	Subsurface Soil	Groundwater	Surface Water	Sediment	Drums, Containers, and Building Materials/SACM	VOCs	SVOCs	PCBs	Metals	Cyanide	Asbestos	Waste Characterization	Temperature (C°)	Conductivity (mS/cm)	Dissolved Oxygen (%)	pH	Turbidity (nTu)	VOCs	SVOCs	PCBs	Metals	Cyanide	Asbestos	Waste Characterization
Quincy Stamp Mills (continued)																													
QMCM-ASBBLK79A	5/26/2017	QMCM-ASBBLK79A-052617	1SF	Hand Tools						X						X													
QMCM-ASBBLK80A	5/26/2017	QMCM-ASBBLK80A-052617	15LF, potentially more buried	Hand Tools						X						X													
QMCM-ASBBLK80B	5/26/2017	QMCM-ASBBLK80B-052617	sample not analyzed due to prior positive series	Hand Tools						X						X													
QMCM-ASBBLK80C	5/26/2017	QMCM-ASBBLK80C-052617	sample not analyzed due to prior positive series	Hand Tools						X						X													
QMCM-ASBBLK81A	5/26/2017	QMCM-ASBBLK81A-052617	5SF	Hand Tools						X						X													
QMCM-ASBBLK82A	5/26/2017	QMCM-ASBBLK82A-052617	5SF	Hand Tools						X						X													
QMCM-ASBBLK83A	5/26/2017	QMCM-ASBBLK83A-052617	5SF, potentially more buried	Hand Tools						X						X													
QMCM-ASBBLK84A	5/26/2017	QMCM-ASBBLK84A-052617	10SF, small pieces scattered in area	Hand Tools						X						X													
QMCM-ASBBLK85A	5/26/2017	QMCM-ASBBLK85A-052617	800CF	Hand Tools						X						X													
QMCM-ASBBLK85B	5/26/2017	QMCM-ASBBLK85B-052617		Hand Tools						X						X													
QMCM-ASBBLK85C	5/26/2017	QMCM-ASBBLK85C-052617		Hand Tools						X						X													
QMCM-ASBBLK86A	5/26/2017	QMCM-ASBBLK86A-052617	25SF, scattered in area, potentially more	Hand Tools						X						X													
QMCM-ASBBLK87A	5/26/2017	QMCM-ASBBLK87A-052617	35SF	Hand Tools						X						X													
QMCM-ASBBLK87B	5/26/2017	QMCM-ASBBLK87B-052617		Hand Tools						X						X													
QMCM-ASBBLK87C	5/26/2017	QMCM-ASBBLK87C-052617		Hand Tools						X						X													
QMCM-RPM01	5/16/2017	QMCM-RPM01 0"-6"		Hand Tools						X	X	X	X	X	X		X												
QMCM-RPM04	5/16/2017	QMCM-RPM04 0"-6"		Hand Tools						X	X	X	X	X	X		X												
QMCM-RPM05	5/16/2017	QMCM-RPM05 0"-6"		Hand Tools						X	X	X	X	X	X		X												
QMCM-RPM06	5/16/2017	QMCM-RPM06 0"-6"		Hand Tools						X	X	X	X	X	X		X												
QMCM-DM02	5/17/2017	QMCM-DM02 0"-6"		Hand Tools						X	X	X	X	X	X		X												
QMCM-DM03	5/17/2017	QMCM-DM03 0"-6"		Hand Tools						X	X	X	X	X	X		X												
Quincy Reclamation Plant																													
QMCM-SS41	5/17/2017	QMCM-SS41 0"-6"		Hand Tools	X								X	X															
QMCM-SS42	5/17/2017	QMCM-SS42 0"-6"		Hand Tools	X								X	X															
QMCM-SS43	5/17/2017	QMCM-SS43 0"-6"		Hand Tools	X								X	X															
QMCM-SS44	5/17/2017	QMCM-SS44 0"-6"		Hand Tools	X								X	X												X			
QMCM-SS45	5/17/2017	QMCM-SS45 0"-6"		Hand Tools	X								X																
QMCM-SS46	5/17/2017	QMCM-SS46 0"-6"		Hand Tools	X								X																
QMCM-SB09	5/20/2017	QMCM-SB09 0-6"	Labeled SB39 in field	Direct Push Boring	X						X	X	X	X															
	5/20/2017	QMCM-SB09 6"-4'		Direct Push Boring		X					X	X	X	X															
QMCM-SB24	5/19/2017	QMCM-SB24 0-6"	Duplicate omitted	Direct Push Boring	X								X																
	5/19/2017	QMCM-SB24 6"-4'	Duplicate added	Direct Push Boring		X							X												X				
QMCM-SB25	5/19/2017	QMCM-SB25 0-6"		Direct Push Boring	X								X																
	5/19/2017	QMCM-SB25 6"-4'		Direct Push Boring		X							X																
QMCM-SB26	5/19/2017	QMCM-SB26 0-6"	Adjusted coordinates	Direct Push Boring	X								X																
	5/19/2017	QMCM-SB26 6"-4'		Direct Push Boring		X							X																
QMCM-SB27	5/19/2017	QMCM-SB27 0-6"	Adjusted coordinates	Direct Push Boring	X								X																
	5/19/2017	QMCM-SB27 6"-4'		Direct Push Boring		X							X																
QMCM-SB28	5/19/2017	QMCM-SB28 0-6"		Direct Push Boring	X								X																
	5/19/2017	QMCM-SB28 6"-4"		Direct Push Boring		X							X																

TABLE 3-2
Sampling and Analysis Summary
Quincy Mining Company Mason 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
Quincy Reclamation Plant (continued)								
QMCM-SB29	5/19/2017	QMCM-SB29 0-6"	1705254	-88.464347218	47.140931686	Near Substation / PCB exceedance (SS-18)	SILTY SAND, Fine, gray to 1 ft	--
	5/19/2017	QMCM-SB29 6"-4'	1705254			Near Substation / PCB exceedance (SS-18)	SAND, Fine to medium, brown to 5ft; saturated at 4.5 ft	--
QMCM-SB30	5/18/2017	QMCM-SB30 0-6"	1705253	-88.463917975	47.140088413	Proximal to "flammable storage" building	SAND, Fine to medium, light brown to 2 ft	--
	5/18/2017	QMCM-SB30 6"-7'	1705253			Proximal to "flammable storage" building	SAND, Coarse with gravel, dark gray to 4.5 ft; SAND, Fine to medium, brown to 9 ft; saturated at 7 ft	--
QMCM-SB31	5/18/2017	QMCM-SB31 9"-15"	1705253	-88.463991154	47.140066688	Proximal to "flammable storage" building	SAND, Fine to medium, light brown to 6 ft	--
	5/18/2017	QMCM-SB31 15"-7'	1705253			Proximal to "flammable storage" building	SAND, Fine to medium, brown to 9 ft; saturated at 7 ft	--
QMCM-GW09	5/20/2017	QMCM-GW09 10'-15'	1705257	-88.463075796	47.141906679	Petroleum-like odor near drum	Temporary Screen Interval: 10 ft - 15 ft	--
QMCM-GW24	5/19/2017	QMCM-GW24 10-15'	1705257	-88.464478974	47.140999910	Near Substation / PCB exceedance (SS-18)	Temporary Screen Interval: 10 ft - 15 ft	--
QMCM-GW25	5/19/2017	QMCM-GW25 10-15'	1705257	-88.464599334	47.140953453	Near Substation / PCB exceedance (SS-18)	Temporary Screen Interval: 10 ft - 15 ft	--
QMCM-GW26	5/19/2017	QMCM-GW26 8-13'	1705257	-88.464643934	47.140851787	Near Substation / PCB exceedance (SS-18)	Temporary Screen Interval: 8 ft - 13 ft	--
QMCM-GW27	5/19/2017	QMCM-GW27 8-13'	1705257	-88.464461350	47.140816410	Near Substation / PCB exceedance (SS-18)	Temporary Screen Interval: 8 ft - 13 ft	--
QMCM-GW28	5/19/2017	QMCM-GW28 8-13'	1705257	-88.464302648	47.140828164	Near Substation / PCB exceedance (SS-18)	Temporary Screen Interval: 8 ft - 13 ft	--
QMCM-GW29	5/19/2017	QMCM-GW29 8-13'	1705257	-88.464347218	47.140931686	Near Substation / PCB exceedance (SS-18)	Temporary Screen Interval: 8 ft - 13 ft	--
QMCM-GW30	5/18/2017	QMCM-GW30 12-17'	1705257	-88.463917975	47.140088413	Proximal to "flammable storage" building	Temporary Screen Interval: 12 ft - 17 ft	--
QMCM-GW31	5/18/2017	QMCM-GW31 12-17'	1705257	-88.463991154	47.140066688	Proximal to "flammable storage" building	Temporary Screen Interval: 12 ft - 17 ft	--
QMCM-GW43	9/17/2017	QMCM-GW43 4-9'	1709155	-88.463448755	47.140026210	Downgradient of samples TMW-03 (9/11/2013), QMCM-GW30, QMCM-GW31 (5/18/2017)	Temporary Screen Interval: 4 ft - 9 ft	--
QMCM-GW44	9/17/2017	QMCM-GW44 4-9'	1709155	-88.463636891	47.139904742	Downgradient of samples TMW-03 (9/11/2013), QMCM-GW30, QMCM-GW31 (5/18/2017)	Temporary Screen Interval: 4 ft - 9 ft	--
QMCM-ASBBLK01A	5/24/2017	QMCM-ASBBLK01A-052417	240-80281-1	-88.463825776	47.139514758	SACM (Observation #75)	tan Transite siding	non-friable
QMCM-ASBBLK01B	5/24/2017	QMCM-ASBBLK01B-052417	240-80281-1	-88.463825776	47.139514758	SACM (Observation #75)	tan Transite siding	non-friable
QMCM-ASBBLK01C	5/24/2017	QMCM-ASBBLK01C-052417	240-80281-1	-88.463825776	47.139514758	SACM (Observation #75)	tan Transite siding	non-friable
QMCM-ASBBLK02A	5/24/2017	QMCM-ASBBLK02A-052417	240-80281-1	-88.464632198	47.139897424	SACM (Observation #72)	black tar roofing	non-friable
QMCM-ASBBLK02B	5/24/2017	QMCM-ASBBLK02B-052417	240-80281-1	-88.464632198	47.139897424	SACM (Observation #72)	black tar roofing	non-friable
QMCM-ASBBLK02C	5/24/2017	QMCM-ASBBLK02C-052417	240-80281-1	-88.464632198	47.139897424	SACM (Observation #72)	black tar roofing	non-friable
QMCM-ASBBLK03A	5/24/2017	QMCM-ASBBLK03A-052417	240-80281-1	-88.464470611	47.139780199	SACM (Observation #73)	conveyor belt wrapping	non-friable
QMCM-ASBBLK03B	5/24/2017	QMCM-ASBBLK03B-052417	240-80281-1	-88.464470611	47.139780199	SACM (Observation #73)	conveyor belt wrapping	non-friable
QMCM-ASBBLK03C	5/24/2017	QMCM-ASBBLK03C-052417	240-80281-1	-88.464470611	47.139780199	SACM (Observation #73)	conveyor belt wrapping	non-friable
QMCM-ASBBLK04A	5/24/2017	QMCM-ASBBLK04A-052417	240-80281-1	-88.464299803	47.139791797	SACM (Observation #74)	black roofing w/ metallic coating	non-friable
QMCM-ASBBLK04B	5/24/2017	QMCM-ASBBLK04B-052417	240-80281-1	-88.464299803	47.139791797	SACM (Observation #74)	black roofing w/ metallic coating	non-friable
QMCM-ASBBLK04C	5/24/2017	QMCM-ASBBLK04C-052417	240-80281-1	-88.464299803	47.139791797	SACM (Observation #74)	black roofing w/ metallic coating	non-friable
QMCM-ASBBLK05A	5/24/2017	QMCM-ASBBLK05A-052417	240-80281-1	-88.464839445	47.139997115	SACM (Observation #71)	black wire wrap	non-friable
QMCM-ASBBLK05B	5/24/2017	QMCM-ASBBLK05B-052417	240-80281-1	-88.464839445	47.139997115	SACM (Observation #71)	black wire wrap	non-friable
QMCM-ASBBLK05C	5/24/2017	QMCM-ASBBLK05C-052417	240-80281-1	-88.464839445	47.139997115	SACM (Observation #71)	black wire wrap	non-friable
QMCM-ASBBLK06A	5/24/2017	QMCM-ASBBLK06A-052417	240-80281-1	-88.464201689	47.140126559	SACM (Observation #64)	roofing w/ metallic paint	friable
QMCM-ASBBLK06B	5/24/2017	QMCM-ASBBLK06B-052417	240-80281-1	-88.464201689	47.140126559	SACM (Observation #64)	roofing w/ metallic paint	friable
QMCM-ASBBLK06C	5/24/2017	QMCM-ASBBLK06C-052417	240-80281-1	-88.464201689	47.140126559	SACM (Observation #64)	roofing w/ metallic paint	friable
QMCM-ASBBLK07A	5/24/2017	QMCM-ASBBLK07A-052417	240-80281-1	-88.464201689	47.140126559	SACM (Observation #64)	silver felt paper	friable
QMCM-ASBBLK07B	5/24/2017	QMCM-ASBBLK07B-052417	240-80281-1	-88.464201689	47.140126559	SACM (Observation #64)	silver felt paper	friable
QMCM-ASBBLK07C	5/24/2017	QMCM-ASBBLK07C-052417	240-80281-1	-88.464201689	47.140126559	SACM (Observation #64)	silver felt paper	friable
QMCM-ASBBLK08A	5/24/2017	QMCM-ASBBLK08A-052417	240-80281-1	-88.464444268	47.140439221	SACM (Observation #65)	brownish fibrous string material	friable
QMCM-ASBBLK08B	5/24/2017	QMCM-ASBBLK08B-052417	240-80281-1	-88.464444268	47.140439221	SACM (Observation #65)	brownish fibrous string material	friable
QMCM-ASBBLK08C	5/24/2017	QMCM-ASBBLK08C-052417	240-80281-1	-88.464444268	47.140439221	SACM (Observation #65)	brownish fibrous string material	friable
QMCM-ASBBLK09A	5/24/2017	QMCM-ASBBLK09A-052417	240-80281-1	-88.464444268	47.140439221	SACM (Observation #65)	brown suspect TSI material	friable

TABLE 3-2
Sampling and Analysis Summary
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Proposed Sampling Location	Sample Date	Field Sample Identification	Sample Notes	Sampling Method	Sample Type/Matrix						Requested Laboratory Analyses							Water Quality Parameters					Duplicate Analyses						
					Surface Soil	Subsurface Soil	Groundwater	Surface Water	Sediment	Drums, Containers, and Building Materials/SACM	VOCs	SVOCs	PCBs	Metals	Cyanide	Asbestos	Waste Characterization	Temperature (C°)	Conductivity (mS/cm)	Dissolved Oxygen (%)	pH	Turbidity (nTu)	VOCs	SVOCs	PCBs	Metals	Cyanide	Asbestos	Waste Characterization
Quincy Reclamation Plant (continued)																													
QMCM-SB29	5/19/2017	QMCM-SB29 0-6"	Adjusted coordinates	Direct Push Boring	X								X																
	5/19/2017	QMCM-SB29 6"-4'		Direct Push Boring		X							X																
QMCM-SB30	5/18/2017	QMCM-SB30 0-6"	Duplicate omitted	Direct Push Boring	X						X	X	X	X	X														
	5/18/2017	QMCM-SB30 6"-7'	Duplicate added	Direct Push Boring		X					X	X	X	X	X								X	X	X	X	x		
QMCM-SB31	5/18/2017	QMCM-SB31 9"-15"		Direct Push Boring	X						X	X	X	X	X														
	5/18/2017	QMCM-SB31 15"-7'		Direct Push Boring		X					X	X	X	X	X														
QMCM-GW09	5/20/2017	QMCM-GW09 10'-15'	Adjusted coordinates	Peristaltic Pump			X				X	X	X	X				NA	NA	NA	NA	NM							
QMCM-GW24	5/19/2017	QMCM-GW24 10-15'		Peristaltic Pump			X						X					10	0.439	82	6.78	NM							
QMCM-GW25	5/19/2017	QMCM-GW25 10-15'		Peristaltic Pump			X						X					8.3	0.56	75.7	7.06	NM							
QMCM-GW26	5/19/2017	QMCM-GW26 8-13'	Adjusted coordinates	Peristaltic Pump			X						X					7.1	0.173	62.2	6.98	NM							
QMCM-GW27	5/19/2017	QMCM-GW27 8-13'	Adjusted coordinates	Peristaltic Pump			X						X					7.1	0.173	62.2	6.98	NM							
QMCM-GW28	5/19/2017	QMCM-GW28 8-13'		Peristaltic Pump			X						X					NA	NA	NA	NA	NM							
QMCM-GW29	5/19/2017	QMCM-GW29 8-13'	Adjusted coordinates	Peristaltic Pump			X						X					11.6	0.35	86.4	7.16	NM							
QMCM-GW30	5/18/2017	QMCM-GW30 12-17'		Peristaltic Pump			X				X	X	X	X				6	0.19	2.6	6.84	NM	X	X	X	X			
QMCM-GW31	5/18/2017	QMCM-GW31 12-17'		Peristaltic Pump			X				X	X	X	X				6.2	0.209	2.2	7.18	NM							
QMCM-GW43	9/17/2017	QMCM-GW43 4-9'	No cuttings	Peristaltic Pump							X	X						13.7	0.361	2.5	6.57	NM							
QMCM-GW44	9/17/2017	QMCM-GW44 4-9'	No cuttings	Peristaltic Pump							X	X						12.8	0.284	2	6.22	NM							
QMCM-ASBBLK01A	5/24/2017	QMCM-ASBBLK01A-052417	3 SF, potentially more buried	Hand Tools						X						X													
QMCM-ASBBLK01B	5/24/2017	QMCM-ASBBLK01B-052417	sample not analyzed due to prior positive series	Hand Tools						X						X													
QMCM-ASBBLK01C	5/24/2017	QMCM-ASBBLK01C-052417	sample not analyzed due to prior positive series	Hand Tools						X						X													
QMCM-ASBBLK02A	5/24/2017	QMCM-ASBBLK02A-052417	150SF, buried near wooden floorboard	Hand Tools						X						X													
QMCM-ASBBLK02B	5/24/2017	QMCM-ASBBLK02B-052417		Hand Tools						X						X													
QMCM-ASBBLK02C	5/24/2017	QMCM-ASBBLK02C-052417		Hand Tools						X						X													
QMCM-ASBBLK03A	5/24/2017	QMCM-ASBBLK03A-052417	each tube is approximately 3'x3'	Hand Tools						X						X													
QMCM-ASBBLK03B	5/24/2017	QMCM-ASBBLK03B-052417		Hand Tools						X						X													
QMCM-ASBBLK03C	5/24/2017	QMCM-ASBBLK03C-052417		Hand Tools						X						X													
QMCM-ASBBLK04A	5/24/2017	QMCM-ASBBLK04A-052417	buried material, with wooden floorboard approximately 10'x15'	Hand Tools						X						X													
QMCM-ASBBLK04B	5/24/2017	QMCM-ASBBLK04B-052417	sample not analyzed due to prior positive series	Hand Tools						X						X													
QMCM-ASBBLK04C	5/24/2017	QMCM-ASBBLK04C-052417	sample not analyzed due to prior positive series	Hand Tools						X						X													
QMCM-ASBBLK05A	5/24/2017	QMCM-ASBBLK05A-052417	5LF visible, potentially more buried	Hand Tools						X						X													
QMCM-ASBBLK05B	5/24/2017	QMCM-ASBBLK05B-052417		Hand Tools						X						X													
QMCM-ASBBLK05C	5/24/2017	QMCM-ASBBLK05C-052417		Hand Tools						X						X													
QMCM-ASBBLK06A	5/24/2017	QMCM-ASBBLK06A-052417	mixed with debris and found scattered throughout foundation	Hand Tools						X						X													
QMCM-ASBBLK06B	5/24/2017	QMCM-ASBBLK06B-052417	sample not analyzed due to prior positive series	Hand Tools						X						X													
QMCM-ASBBLK06C	5/24/2017	QMCM-ASBBLK06C-052417	sample not analyzed due to prior positive series	Hand Tools						X						X													
QMCM-ASBBLK07A	5/24/2017	QMCM-ASBBLK07A-052417	130SF, found around inside of circular concrete structures	Hand Tools						X						X													
QMCM-ASBBLK07B	5/24/2017	QMCM-ASBBLK07B-052417	sample not analyzed due to prior positive series	Hand Tools						X						X													
QMCM-ASBBLK07C	5/24/2017	QMCM-ASBBLK07C-052417	sample not analyzed due to prior positive series	Hand Tools						X						X													
QMCM-ASBBLK08A	5/24/2017	QMCM-ASBBLK08A-052417	25SF, found between wooden boards and concrete structure near silver felt paper	Hand Tools						X						X													
QMCM-ASBBLK08B	5/24/2017	QMCM-ASBBLK08B-052417		Hand Tools						X						X													
QMCM-ASBBLK08C	5/24/2017	QMCM-ASBBLK08C-052417		Hand Tools						X						X													
QMCM-ASBBLK09A	5/24/2017	QMCM-ASBBLK09A-052417	2SF of material is visible on wooden board, more may be buried	Hand Tools						X						X													

TABLE 3-2
Sampling and Analysis Summary
Quincy Mining Company Mason 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
Quincy Reclamation Plant (continued)								
QMCM-ASBBLK10A	5/24/2017	QMCM-ASBBLK10A-052417	240-80281-1	-88.464444268	47.140439221	SACM (Observation #65)	black tar mastic	non-friable
QMCM-ASBBLK10B	5/24/2017	QMCM-ASBBLK10B-052417	240-80281-1	-88.464444268	47.140439221	SACM (Observation #65)	black tar mastic	non-friable
QMCM-ASBBLK10C	5/24/2017	QMCM-ASBBLK10C-052417	240-80281-1	-88.464444268	47.140439221	SACM (Observation #65)	black tar mastic	non-friable
QMCM-ASBBLK11A	5/24/2017	QMCM-ASBBLK11A-052417	240-80281-1	-88.464250670	47.140745335	SACM (Observation #67)	rubber coated fabric	non-friable
QMCM-ASBBLK11B	5/24/2017	QMCM-ASBBLK11B-052417	240-80281-1	-88.464250670	47.140745335	SACM (Observation #67)	rubber coated fabric	non-friable
QMCM-ASBBLK11C	5/24/2017	QMCM-ASBBLK11C-052417	240-80281-1	-88.464250670	47.140745335	SACM (Observation #67)	rubber coated fabric	non-friable
QMCM-ASBBLK12A	5/24/2017	QMCM-ASBBLK12A-052417	240-80281-1	-88.464200005	47.140660336	SACM (Observation #68)	black hydraulic tubing	non-friable
QMCM-ASBBLK12B	5/24/2017	QMCM-ASBBLK12B-052417	240-80281-1	-88.464200005	47.140660336	SACM (Observation #68)	black hydraulic tubing	non-friable
QMCM-ASBBLK12C	5/24/2017	QMCM-ASBBLK12C-052417	240-80281-1	-88.464200005	47.140660336	SACM (Observation #68)	black hydraulic tubing	non-friable
QMCM-ASBBLK13A	5/24/2017	QMCM-ASBBLK13A-052417	240-80281-1	-88.463342019	47.140783211	SACM (Observation #62)	2in black fabric wrapped tubing	non-friable
QMCM-ASBBLK13B	5/24/2017	QMCM-ASBBLK13B-052417	240-80281-1	-88.463342019	47.140783211	SACM (Observation #62)	2in black fabric wrapped tubing	non-friable
QMCM-ASBBLK13C	5/24/2017	QMCM-ASBBLK13C-052417	240-80281-1	-88.463342019	47.140783211	SACM (Observation #62)	2in black fabric wrapped tubing	non-friable
QMCM-ASBBLK14A	5/24/2017	QMCM-ASBBLK14A-052417	240-80281-1	-88.463342019	47.140783211	SACM (Observation #62)	fabric wire wrap	non-friable
QMCM-ASBBLK14B	5/24/2017	QMCM-ASBBLK14B-052417	240-80281-1	-88.463342019	47.140783211	SACM (Observation #62)	fabric wire wrap	non-friable
QMCM-ASBBLK14C	5/24/2017	QMCM-ASBBLK14C-052417	240-80281-1	-88.463342019	47.140783211	SACM (Observation #62)	fabric wire wrap	non-friable
QMCM-ASBBLK15A	5/24/2017	QMCM-ASBBLK15A-052417	240-80281-1	-88.463342019	47.140783211	SACM (Observation #62)	green shingle	non-friable
QMCM-ASBBLK15B	5/24/2017	QMCM-ASBBLK15B-052417	240-80281-1	-88.463342019	47.140783211	SACM (Observation #62)	green shingle	non-friable
QMCM-ASBBLK15C	5/24/2017	QMCM-ASBBLK15C-052417	240-80281-1	-88.463342019	47.140783211	SACM (Observation #62)	green shingle	non-friable
QMCM-ASBBLK16A	5/24/2017	QMCM-ASBBLK16A-052417	240-80281-1	-88.463342019	47.140783211	SACM (Observation #62)	black roofing w/ layered felt paper	friable
QMCM-ASBBLK16B	5/24/2017	QMCM-ASBBLK16B-052417	240-80281-1	-88.463342019	47.140783211	SACM (Observation #62)	black roofing w/ layered felt paper	friable
QMCM-ASBBLK16C	5/24/2017	QMCM-ASBBLK16C-052417	240-80281-1	-88.463342019	47.140783211	SACM (Observation #62)	black roofing w/ layered felt paper	friable
QMCM-ASBBLK17A	5/24/2017	QMCM-ASBBLK17A-052417	240-80281-1	-88.463342019	47.140783211	SACM (Observation #62)	white suspect TSI fibrous material	friable
QMCM-ASBBLK17B	5/24/2017	QMCM-ASBBLK17B-052417	240-80281-1	-88.463342019	47.140783211	SACM (Observation #62)	white suspect TSI fibrous material	friable
QMCM-ASBBLK17C	5/24/2017	QMCM-ASBBLK17C-052417	240-80281-1	-88.463342019	47.140783211	SACM (Observation #62)	white suspect TSI fibrous material	friable
QMCM-ASBBLK18A	5/24/2017	QMCM-ASBBLK18A-052417	240-80281-1	-88.463342019	47.140783211	SACM (Observation #62)	1in black solid tubing	non-friable
QMCM-ASBBLK18B	5/24/2017	QMCM-ASBBLK18B-052417	240-80281-1	-88.463342019	47.140783211	SACM (Observation #62)	1in black solid tubing	non-friable
QMCM-ASBBLK18C	5/24/2017	QMCM-ASBBLK18C-052417	240-80281-1	-88.463342019	47.140783211	SACM (Observation #62)	1in black solid tubing	non-friable
QMCM-ASBBLK19A	5/24/2017	QMCM-ASBBLK19A-052417	240-80281-1	-88.463342019	47.140783211	SACM (Observation #62)	white coated wiring wrap	non-friable
QMCM-ASBBLK20A	5/24/2017	QMCM-ASBBLK20A-052417	240-80281-1	-88.463342019	47.140783211	SACM (Observation #62)	black gasket material	non-friable
QMCM-ASBBLK20B	5/24/2017	QMCM-ASBBLK20B-052417	240-80281-1	-88.463342019	47.140783211	SACM (Observation #62)	black gasket material	non-friable
QMCM-ASBBLK20C	5/24/2017	QMCM-ASBBLK20C-052417	240-80281-1	-88.463342019	47.140783211	SACM (Observation #62)	black gasket material	non-friable
QMCM-ASBBLK21A	5/24/2017	QMCM-ASBBLK21A-052417	240-80281-1	-88.460976000	47.140948792	SACM (Observation #61)	black stripping (caulking) around wood pits	non-friable
QMCM-ASBBLK21B	5/24/2017	QMCM-ASBBLK21B-052417	240-80281-1	-88.460976000	47.140948792	SACM (Observation #61)	black stripping (caulking) around wood pits	non-friable
QMCM-ASBBLK21C	5/24/2017	QMCM-ASBBLK21C-052417	240-80281-1	-88.460976000	47.140948792	SACM (Observation #61)	black stripping (caulking) around wood pits	non-friable
QMCM-SD01	6/8/2017	QMCM-SD01 0-2.9'	1706168	-88.461407709	47.141085532	Eastern pond near Quincy Reclamation Plant	SILTY CLAY, dark brown, loose, wet to SILTY CLAY, trace sand, dark brown, noncohesive, non-plastic, wet	--
	6/8/2017	QMCM-SD01 2.9-4.5'	1706168			Eastern pond near Quincy Reclamation Plant	SILTY CLAY, trace sand, dark brown, noncohesive, high plasticity, wet to SAND, medium grain, reddish brown	--
QMCM-SD02	6/8/2017	QMCM-SD02 0-1.4'	1706168	-88.461438471	47.140872865	Eastern pond near Quincy Reclamation Plant	SILTY CLAY, dark brown, trace organics, soft, wet to SILTY CLAY, dark brown, trace organics, firm, wet	--
	6/8/2017	QMCM-SD02 1.4-2.25'	1706168			Eastern pond near Quincy Reclamation Plant	SILTY SAND, fine grain, dark brown, firm	--
QMCM-SD03	6/8/2017	QMCM-SD03 0-3'	1706168	-88.461786249	47.140981681	Eastern pond near Quincy Reclamation Plant	SILTY CLAY, dark brown, loose, wet to SANDY SILT, dark brown, soft, wet	--
	6/8/2017	QMCM-SD03 3-3.9'	1706168			Eastern pond near Quincy Reclamation Plant	SILT, dark brown - red mottled, cohesive, high plasticity to SAND medium to coarse grain, brown, stiff, wet	--

TABLE 3-2
Sampling and Analysis Summary
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

					Sample Type/Matrix						Requested Laboratory Analyses							Water Quality Parameters					Duplicate Analyses						
Proposed Sampling Location	Sample Date	Field Sample Identification	Sample Notes	Sampling Method	Surface Soil	Subsurface Soil	Groundwater	Surface Water	Sediment	Drums, Containers, and Building Materials/SACM	VOCs	SVOCs	PCBs	Metals	Cyanide	Asbestos	Waste Characterization	Temperature (C°)	Conductivity (mS/cm)	Dissolved Oxygen (%)	pH	Turbidity (nTu)	VOCs	SVOCs	PCBs	Metals	Cyanide	Asbestos	Waste Characterization
Quincy Reclamation Plant (continued)																													
QMCM-ASBBLK10A	5/24/2017	QMCM-ASBBLK10A-052417	100SF, found on NE corner of concrete structures	Hand Tools						X						X												X	
QMCM-ASBBLK10B	5/24/2017	QMCM-ASBBLK10B-052417		Hand Tools						X						X													
QMCM-ASBBLK10C	5/24/2017	QMCM-ASBBLK10C-052417		Hand Tools						X						X													
QMCM-ASBBLK11A	5/24/2017	QMCM-ASBBLK11A-052417	10SF	Hand Tools						X						X													
QMCM-ASBBLK11B	5/24/2017	QMCM-ASBBLK11B-052417		Hand Tools						X						X													
QMCM-ASBBLK11C	5/24/2017	QMCM-ASBBLK11C-052417		Hand Tools						X						X													
QMCM-ASBBLK12A	5/24/2017	QMCM-ASBBLK12A-052417	20LF	Hand Tools						X						X													
QMCM-ASBBLK12B	5/24/2017	QMCM-ASBBLK12B-052417		Hand Tools						X						X													
QMCM-ASBBLK12C	5/24/2017	QMCM-ASBBLK12C-052417		Hand Tools						X						X													
QMCM-ASBBLK13A	5/24/2017	QMCM-ASBBLK13A-052417	10LF	Hand Tools						X						X													
QMCM-ASBBLK13B	5/24/2017	QMCM-ASBBLK13B-052417		Hand Tools						X						X													
QMCM-ASBBLK13C	5/24/2017	QMCM-ASBBLK13C-052417		Hand Tools						X						X													
QMCM-ASBBLK14A	5/24/2017	QMCM-ASBBLK14A-052417	3LF	Hand Tools						X						X													
QMCM-ASBBLK14B	5/24/2017	QMCM-ASBBLK14B-052417		Hand Tools						X						X													
QMCM-ASBBLK14C	5/24/2017	QMCM-ASBBLK14C-052417		Hand Tools						X						X													
QMCM-ASBBLK15A	5/24/2017	QMCM-ASBBLK15A-052417	5SF	Hand Tools						X						X													
QMCM-ASBBLK15B	5/24/2017	QMCM-ASBBLK15B-052417		Hand Tools						X						X													
QMCM-ASBBLK15C	5/24/2017	QMCM-ASBBLK15C-052417		Hand Tools						X						X													
QMCM-ASBBLK16A	5/24/2017	QMCM-ASBBLK16A-052417	100SF, scattered throughout Shore Plant foundational area	Hand Tools						X						X													
QMCM-ASBBLK16B	5/24/2017	QMCM-ASBBLK16B-052417		Hand Tools						X						X													
QMCM-ASBBLK16C	5/24/2017	QMCM-ASBBLK16C-052417		Hand Tools						X						X													
QMCM-ASBBLK17A	5/24/2017	QMCM-ASBBLK17A-052417	3SF, potentially more buried in wood debris	Hand Tools						X						X													
QMCM-ASBBLK17B	5/24/2017	QMCM-ASBBLK17B-052417	sample not analyzed due to prior positive series	Hand Tools						X						X													
QMCM-ASBBLK17C	5/24/2017	QMCM-ASBBLK17C-052417	sample not analyzed due to prior positive series	Hand Tools						X						X													
QMCM-ASBBLK18A	5/24/2017	QMCM-ASBBLK18A-052417	7LF	Hand Tools						X						X													
QMCM-ASBBLK18B	5/24/2017	QMCM-ASBBLK18B-052417		Hand Tools						X						X													
QMCM-ASBBLK18C	5/24/2017	QMCM-ASBBLK18C-052417		Hand Tools						X						X													
QMCM-ASBBLK19A	5/24/2017	QMCM-ASBBLK19A-052417	2LF	Hand Tools						X						X													
QMCM-ASBBLK20A	5/24/2017	QMCM-ASBBLK20A-052417	5SF	Hand Tools						X						X													
QMCM-ASBBLK20B	5/24/2017	QMCM-ASBBLK20B-052417		Hand Tools						X						X													
QMCM-ASBBLK20C	5/24/2017	QMCM-ASBBLK20C-052417		Hand Tools						X						X													
QMCM-ASBBLK21A	5/24/2017	QMCM-ASBBLK21A-052417	300LF, surrounding wooden pits	Hand Tools						X						X													
QMCM-ASBBLK21B	5/24/2017	QMCM-ASBBLK21B-052417	sample not analyzed due to prior positive series	Hand Tools						X						X													
QMCM-ASBBLK21C	5/24/2017	QMCM-ASBBLK21C-052417	sample not analyzed due to prior positive series	Hand Tools						X						X													
QMCM-SD01	6/8/2017	QMCM-SD01 0-2.9'		Vibracore Sampler					X			X	X	X															
	6/8/2017	QMCM-SD01 2.9-4.5'		Vibracore Sampler					X			X	X																
QMCM-SD02	6/8/2017	QMCM-SD02 0-1.4'		Vibracore Sampler					X			X	X	X															
	6/8/2017	QMCM-SD02 1.4-2.25'		Vibracore Sampler					X			X	X																
QMCM-SD03	6/8/2017	QMCM-SD03 0-3'		Vibracore Sampler					X			X	X	X															
	6/8/2017	QMCM-SD03 3-3.9'		Vibracore Sampler					X			X	X																

TABLE 3-2
Sampling and Analysis Summary
Quincy Mining Company Mason 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
Quincy Reclamation Plant (continued)								
QMCM-SD04	6/9/2017	QMCM-SD04 0-1'	1706168	-88.462901066	47.140783714	Western pond near Quincy Reclamation Plant - Shore Plant	SILT, dark brown - black, saturated, loose, oily sheen to SILTY SAND, fine grain, brown, firm, moist, oily sheen	--
	6/9/2017	QMCM-SD04 1-1.9'	1706168			Western pond near Quincy Reclamation Plant - Shore Plant	SILTY SAND, medium grain, brown, trace copper colored flecks, oily sheen	--
QMCM-SD05	6/9/2017	QMCM-SD05 0-1.4'	1706168	-88.462962584	47.140561640	Western pond near Quincy Reclamation Plant - Shore Plant	SILT, dark brown - black, saturated, loose to SAND, brown, fine grain, firm, moist	--
	6/9/2017	QMCM-SD05 1.4-2.75'	1706168			Western pond near Quincy Reclamation Plant - Shore Plant	SAND, brown, fine grain, firm, moist	--
QMCM-SD06	6/9/2017	QMCM-SD06 0-1.4'	1706168	-88.463244053	47.140415073	Western pond near Quincy Reclamation Plant - Shore Plant	SILT, dark brown - black, loose, wet to SILTY SAND, fine grain, brown, firm, moist	--
	6/9/2017	QMCM-SD06 1.4-2.75'	1706168			Western pond near Quincy Reclamation Plant - Shore Plant	SILTY SAND, fine grain, brown, firm, moist	--
QMCM-SD07	6/9/2017	QMCM-SD07 0-2.3'	1706168	-88.462629696	47.140201788	Drainage between pond and Torch Lake	SANDY SILT, dark brown, organics, soft, wet to GRAVELLY SAND, medium to coarse grain, dark brown - red, poorly sorted, wet to CLAY red brown mottled, cohesive, soft to SAND, fine grain, brown, well sorted, moist	--
	6/9/2017	QMCM-SD07 2.3-4.8'	1706168			Drainage between pond and Torch Lake	CLAY, reddish brown, noncohesive, non-plastic, loose, saturated to SAND, fine grain, well sorted, reddish brown	--
QMCM-SD08	6/9/2017	QMCM-SD08 0-1.25'	1706168	-88.460517764	47.139930623	Drainage between pond and Torch Lake	SILTY SAND, fine grain, well sorted, dark brown, moist to GRAVELLY SAND, coarse grain, reddish brown, stiff to SILTY SAND, fine grain, well sorted, brown, stiff, wet	--
	6/9/2017	QMCM-SD08 1.25-2.8'	1706168			Drainage between pond and Torch Lake	SILTY SAND, fine grain, well sorted, brown, stiff, wet	--
QMCM-SD09	6/9/2017	QMCM-SD09 0-2.75'	1706168	-88.462351459	47.139294159	Drainage channel between Quincy Reclamation Plant and Quincy Stamp Sands	SILTY CLAY, dark brown - black, loose, saturated to SAND, fine grain, well sorted, brown, stiff, wet	--
	6/9/2017	QMCM-SD09 2.75-4.9'	1706168			Drainage channel between Quincy Reclamation Plant and Quincy Stamp Sands	SILTY CLAY, red brown mottled, noncohesive, non-plastic, loose, wet, firm at bottom of core	--
QMCM-SW01	6/8/2017	QMCM-SW01	1706166	-88.461438471	47.140872865	Eastern pond near Quincy Reclamation Plant		--
QMCM-SW02	6/9/2017	QMCM-SW02	1706166	-88.462962584	47.140561640	Western pond near Quincy Reclamation Plant		--
QMCM-SW03	6/9/2017	QMCM-SW03	1706166	-88.462629696	47.140201788	Drainage between pond and Torch Lake		--
QMCM-SW04	6/9/2017	QMCM-SW04	1706166	-88.462351459	47.139294159	Drainage channel between Quincy Reclamation Plant and Quincy Stamp Sands		--
QMCM-RPM02	5/17/2017	QMCM-RPM02 0"-6"	17051193	-88.464233481	47.140404328	Re-sample location SS-03 (9/10/2013)	Brown, medium grained sandy material, with gravel pieces	--
QMCM-RPM03	5/17/2017	QMCM-RPM03 0"-6"	17051193	-88.464372681	47.140300123	Composite sample of soil/waste on foundation floor	Black, brown crusted material, viscid underneath crust	--
QMCM-RPM07	5/17/2017	QMCM-RPM06 0"-6"	17051193	-88.463342020	47.140783210	Composite sample of waste on foundation of Quincy Reclamation Plant - Shore Plant	Brown and gray fine-grained sand, with hardened appearance on 'top	--
QMCM-SW06	6/9/2017	QMCM-SW06	1706166	-88.461058071	47.140941230	Wood-lined pits east of Eastern pond near Quincy Reclamation Plant - Shore Plant		--
QMCM-SW07	6/9/2017	QMCM-SW07	1706166	-88.460868611	47.140931967	Wood-lined pits east of Eastern pond near Quincy Reclamation Plant - Shore Plant		--
Quincy Stamp Sands								
QMCM-SB32	5/20/2017	QMCM-SB32 9"-15"	1705254	-88.468083423	47.133758372	Proximal to SB-07-2_5 (11/30/2016)	SAND, Fine to medium, gray to 9 ft; saturated at 5 ft	--
	5/20/2017	QMCM-SB32 15"-5'	1705254			Proximal to SB-07-2_5 (11/30/2016)	SAND, Fine to medium, gray to 9 ft; saturated at 5 ft	--
QMCM-SB33	5/20/2017	QMCM-SB33 6"-12"	1705254	-88.470350063	47.132181808	Proximal to SB-07-2_5 (11/30/2016)	SAND, Fine to medium, gray to 5 ft; saturated at 4 ft	--
	5/20/2017	QMCM-SB33 1'-4'	1705254			Proximal to SB-07-2_5 (11/30/2016)	SAND, Fine to medium, gray to 5 ft; saturated at 4 ft	--
QMCM-SB34	5/20/2017	QMCM-SB34 12"-18"	1705254	-88.467477336	47.131844332	Immediately proximal to SB-07-2_5 (11/30/2016)	SAND, Fine to medium, gray to 5 ft; saturated at 2 ft	--
	5/20/2017	QMCM-SB34 18"-24"	1705254			Immediately proximal to SB-07-2_5 (11/30/2016)	SAND, Fine to medium, gray to 5 ft; saturated at 2 ft	--
QMCM-SB35	5/20/2017	QMCM-SB35 12"-18"	1705254	-88.464476539	47.132718197	Proximal to SB-07-2_5 (11/30/2016)	SAND, Fine to medium, gray to 5 ft; saturated at 5 ft	--
	5/20/2017	QMCM-SB35 18"-5'	1705254			Proximal to SB-07-2_5 (11/30/2016)	SAND, Fine to medium, gray to 5 ft; saturated at 5 ft	--
QMCM-SB36	5/20/2017	QMCM-SB36 6"-12"	1705254	-88.462621777	47.130104252	Proximal to SB-07-2_5 (11/30/2016)	SAND, Fine to medium, reddish brown to 2 ft	--
	5/20/2017	QMCM-SB36 12"-2'	1705254			Proximal to SB-07-2_5 (11/30/2016)	SAND, Fine to medium, reddish brown to 2 ft	--
QMCM-GW32	5/20/2017	QMCM-GW32 10'-15'	1705257	-88.468083423	47.133758372	Proximal to SB-07-2_5 (11/30/2016)	Temporary Screen Interval: 10 ft - 15 ft	--

TABLE 3-2
Sampling and Analysis Summary
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Proposed Sampling Location	Sample Date	Field Sample Identification	Sample Notes	Sampling Method	Sample Type/Matrix						Requested Laboratory Analyses							Water Quality Parameters					Duplicate Analyses						
					Surface Soil	Subsurface Soil	Groundwater	Surface Water	Sediment	Drums, Containers, and Building Materials/SACM	VOCs	SVOCs	PCBs	Metals	Cyanide	Asbestos	Waste Characterization	Temperature (C°)	Conductivity (mS/cm)	Dissolved Oxygen (%)	pH	Turbidity (nTu)	VOCs	SVOCs	PCBs	Metals	Cyanide	Asbestos	Waste Characterization
Quincy Reclamation Plant (continued)																													
QMCM-SD04	6/9/2017	QMCM-SD04 0-1'	Oily sheen observed on water surface after coring	Vibracore Sampler					X			X	X	X															
	6/9/2017	QMCM-SD04 1-1.9'		Vibracore Sampler					X			X	X																
QMCM-SD05	6/9/2017	QMCM-SD05 0-1.4'		Vibracore Sampler					X			X	X	X															
	6/9/2017	QMCM-SD05 1.4-2.75'		Vibracore Sampler					X			X	X																
QMCM-SD06	6/9/2017	QMCM-SD06 0-1.4'		Vibracore Sampler					X			X	X	X															
	6/9/2017	QMCM-SD06 1.4-2.75'		Vibracore Sampler					X			X	X																
QMCM-SD07	6/9/2017	QMCM-SD07 0-2.3'	Collected QMCM-SW03	Vibracore Sampler					X			X	X	X															
	6/9/2017	QMCM-SD07 2.3-4.8'		Vibracore Sampler					X			X	X																
QMCM-SD08	6/9/2017	QMCM-SD08 0-1.25'		Vibracore Sampler					X			X	X	X										X	X	X			
	6/9/2017	QMCM-SD08 1.25-2.8'		Vibracore Sampler					X			X	X																
QMCM-SD09	6/9/2017	QMCM-SD09 0-2.75'		Vibracore Sampler					X			X	X	X															
	6/9/2017	QMCM-SD09 2.75-4.9'		Vibracore Sampler					X			X	X																
QMCM-SW01	6/8/2017	QMCM-SW01		Peristaltic Pump				X				X	X	X				21.2	0.221	83.1	8.28	NM							
QMCM-SW02	6/9/2017	QMCM-SW02		Peristaltic Pump				X				X	X	X				11.1	0.706	1.5	7.94	NM							
QMCM-SW03	6/9/2017	QMCM-SW03		Peristaltic Pump				X				X	X	X				19.6	0.182	78.4	7.57	NM		X	X	X			
QMCM-SW04	6/9/2017	QMCM-SW04		Peristaltic Pump				X				X	X	X				17.2	0.151	69.6	7.34	NM							
QMCM-RPM02	5/17/2017	QMCM-RPM02 0"-6"	Duplicate omitted	Hand Tools						X			X	X			X								X	X			
QMCM-RPM03	5/17/2017	QMCM-RPM03 0"-6"		Hand Tools						X							X												
QMCM-RPM07	5/17/2017	QMCM-RPM06 0"-6"		Hand Tools						X							X												
QMCM-SW06	6/9/2017	QMCM-SW06		Peristaltic Pump				X				X	X	X				22.7	0.226	44.6	7.69	NM							
QMCM-SW07	6/9/2017	QMCM-SW07		Peristaltic Pump				X				X	X	X				17.8	0.170	38.6	7.16	NM							
Quincy Stamp Sands																													
QMCM-SB32	5/20/2017	QMCM-SB32 9"-15"		Direct Push Boring	X						X																		
	5/20/2017	QMCM-SB32 15"-5'		Direct Push Boring		X					X																		
QMCM-SB33	5/20/2017	QMCM-SB33 6"-12"	Duplicate omitted	Direct Push Boring	X						X																		
	5/20/2017	QMCM-SB33 1'-4'	Duplicate added	Direct Push Boring		X					X												X						
QMCM-SB34	5/20/2017	QMCM-SB34 12"-18"		Direct Push Boring	X						X																		
	5/20/2017	QMCM-SB34 18"-24"		Direct Push Boring		X					X																		
QMCM-SB35	5/20/2017	QMCM-SB35 12"-18"		Direct Push Boring	X						X																		
	5/20/2017	QMCM-SB35 18"-5'		Direct Push Boring		X					X																		
QMCM-SB36	5/20/2017	QMCM-SB36 6"-12"		Direct Push Boring	X						X																		
	5/20/2017	QMCM-SB36 12"-2'		Direct Push Boring		X					X																		
QMCM-GW32	5/20/2017	QMCM-GW32 10'-15'		Peristaltic Pump			X				X							NA	NA	NA	NA	NM							

TABLE 3-2
Sampling and Analysis Summary
Quincy Mining Company Mason 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
Quincy Stamp Sands (continued)								
QMCM-GW33	5/20/2017	QMCM-GW33 10'-15'	1705257	-88.470350063	47.132181808	Proximal to SB-07-2_5 (11/30/2016)	Temporary Screen Interval: 10 ft - 15 ft	--
QMCM-GW34	5/20/2017	QMCM-GW34 8-13'	1705257	-88.467477336	47.131844332	Immediately proximal to SB-07-2_5 (11/30/2016)	Temporary Screen Interval: 8 ft - 13 ft	--
QMCM-GW35	5/20/2017	QMCM-GW35 12'-17'	1705257	-88.464476539	47.132718197	Proximal to SB-07-2_5 (11/30/2016)	Temporary Screen Interval: 12 ft - 17 ft	--
QMCM-GW36	5/20/2017	QMCM-GW36 8'-13'	1705257	-88.462621777	47.130104252	Proximal to SB-07-2_5 (11/30/2016)	Temporary Screen Interval: 8 ft - 13 ft	--
QMCM-SD10	6/9/2017	QMCM-SD10 0-0.5'	1706168	-88.471329488	47.133980562	Drainage channel near Quincy Stamp Sands	SANDY CLAY, trace organics, brown, loose, wet	--
	6/9/2017	QMCM-SD10 0.5-1'	1706169			Drainage channel near Quincy Stamp Sands	SAND, coarse grain, well sorted, brown, wet	--
QMCM-SW05	6/9/2017	QMCM-SW05	1706166	-88.471329488	47.133980562	Drainage channel near Quincy Stamp Sands		--
Torch Lake								
QMCM-SD12	6/11/2017	QMCM-SD12 0-1'	1706169	-88.451174817	47.149801601	Observation No. 32 - Quincy Dredge No. 1 - sunken in Torch Lake	SILTY CLAY, reddish brown, loose, wet	--
	6/11/2017	QMCM-SD12 1-2.3'	1706169			Observation No. 32 - Quincy Dredge No. 1 - sunken in Torch Lake	SILTY SAND, fine grain, well sorted, reddish brown, firm, wet	--
QMCM-SD13	6/11/2017	QMCM-SD13 0-3'	1706169	-88.450679670	47.150117099	Observation No. 32 - Quincy Dredge No. 1 - sunken in Torch Lake	SILTY CLAY, reddish brown, loose, soft, wet	--
	6/11/2017	QMCM-SD13 3-4.2'	1706169			Observation No. 32 - Quincy Dredge No. 1 - sunken in Torch Lake	SILTY SAND, fine grain, well sorted, reddish brown, firm, wet	--
QMCM-SD14	6/11/2017	QMCM-SD14 0-0.3'	1706169	-88.450304528	47.149805926	Observation No. 32 - Quincy Dredge No. 1 - sunken in Torch Lake	GRAVELLY SAND, coarse grain, reddish brown, wet	--
QMCM-SD15	6/11/2017	QMCM-SD15 0-1.1'	1706169	-88.450752931	47.149488758	Observation No. 32 - Quincy Dredge No. 1 - sunken in Torch Lake	SANDY GRAVEL, coarse grain, reddish brown, wet	--
	6/11/2017	QMCM-SD15 1.1-2.9'	1706169			Observation No. 32 - Quincy Dredge No. 1 - sunken in Torch Lake	SILTY SAND, fine grain, well sorted, reddish brown, wet to GRAVELLY SAND, poorly sorted, reddish brown, wet to SILTY SAND, fine grain, well sorted, reddish brown, wet to GRAVELLY SAND, poorly sorted, reddish brown, wet to SILTY SAND, fine grain, well sorted, reddish brown, wet to GRAVELLY SAND, poorly sorted, reddish brown, wet	--
QMCM-SD17	6/13/2017	QMCM-SD17 0-2'	1706171	-88.456271795	47.147031053	Observation No. 17 - White drum?	SAND and CLAY, brown, some organics to CLAY, reddish brown, soft, wet to SAND, brown, medium grain, well sorted, with thin clay lenses	--
	6/13/2017	QMCM-SD17 2-4.2'	1706171			Observation No. 17 - White drum?	SAND and CLAY, alternating layers of sand and clay, 1-4in thick	--
QMCM-SD19	6/13/2017	QMCM-SD19 0-2.2'	1706170	-88.456562260	47.146547356	Observation No. 35 - Possible drum carcass?	SAND, brown, medium grain, well sorted to CLAY, reddish brown, loose, wet to SAND, brown medium grain, well sorted to CLAY, reddish brown, soft, wet	--
	6/13/2017	QMCM-SD19 2.2-4.3'	1706170			Observation No. 35 - Possible drum carcass?	CLAY, reddish brown, soft, wet to SAND, brown, medium grain, well sorted to CLAY, reddish brown, soft, wet to SAND, brown, medium grain, well sorted to CLAY, reddish brown, soft, wet	--
QMCM-SD20	6/13/2017	QMCM-SD20 0-2.1'	1706170	-88.456748000	47.146315659	Observation No. 36 - Possible Drum?	CLAY, brown, soft, loose, wet to CLAY WITH COAL, reddish brown, gravel sized coal pieces throughout	--
	6/13/2017	QMCM-SD20 2.1-4.25'	1706170			Observation No. 36 - Possible Drum?	CLAY WITH COAL, reddish brown, gravel sized coal pieces throughout	--
QMCM-SD23	6/12/2017	QMCM-SD23 0-2'	1706170	-88.456908954	47.146015437	Observation No. 2 - Open ended barrel, possible contents	SILTY CLAY, reddish brown, loose, soft, wet	--
	6/12/2017	QMCM-SD23 2-4.25'	1706170			Observation No. 2 - Open ended barrel, possible contents	COAL, gravel sixed pieces of coal to SILTY CLAY, reddish, trace coal pieces, and some cardboard like debris to COAL, large pieces of coal in a fine matrix	--
QMCM-SD26	6/13/2017	QMCM-SD26 0-2.5'	1706171	-88.456826199	47.145907756	Observation No. 39 - Drum	CLAY, reddish brown, soft, loose, wet, coal and rock (slate) at 2ft, coal pieces at 4ft	--
	6/13/2017	QMCM-SD26 2.5-5'	1706171			Observation No. 39 - Drum	CLAY, reddish brown, soft, loose, wet, coal and rock (slate) at 2ft, coal pieces at 4ft	--
QMCM-SD28	6/12/2017	QMCM-SD28 0-2'	1706169	-88.456951470	47.145876770	Observation No. 3 - 1/2 drum, metal debris, near pilings, lumber & debris	SILTY CLAY, reddish brown, soft, loose, wet	--
	6/12/2017	QMCM-SD28 2-4'	1706170			Observation No. 3 - 1/2 drum, metal debris, near pilings, lumber & debris	GRAVELLY SAND, reddish brown, coarse grain, with fines, gravel sized coal pieces to SILTY CLAY, reddish brown, wet, loose, with large coal pieces at bottom	--
QMCM-SD31	6/13/2017	QMCM-SD31 0-2.8'	1706171	-88.456895247	47.145811832	Observation No. 12 - Drum	CLAY, brown, loose, soft, wet to CLAY, reddish brown, loose, wet, small sand seam <1in at 2.5ft, coal at 5.6ft	--
	6/13/2017	QMCM-SD31 2.8-5.6'	1706171			Observation No. 12 - Drum	CLAY, brown, loose, soft, wet to CLAY, reddish brown, loose, wet, small sand seam <1in at 2.5ft, coal at 5.6ft	--

TABLE 3-2
Sampling and Analysis Summary
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Proposed Sampling Location	Sample Date	Field Sample Identification	Sample Notes	Sampling Method	Sample Type/Matrix						Requested Laboratory Analyses							Water Quality Parameters					Duplicate Analyses						
					Surface Soil	Subsurface Soil	Groundwater	Surface Water	Sediment	Drums, Containers, and Building Materials/SACM	VOCs	SVOCs	PCBs	Metals	Cyanide	Asbestos	Waste Characterization	Temperature (C°)	Conductivity (mS/cm)	Dissolved Oxygen (%)	pH	Turbidity (nTu)	VOCs	SVOCs	PCBs	Metals	Cyanide	Asbestos	Waste Characterization
Quincy Stamp Sands (continued)																													
QMCM-GW33	5/20/2017	QMCM-GW33 10'-15'		Peristaltic Pump			X				X							NA	NA	NA	NA	NM							
QMCM-GW34	5/20/2017	QMCM-GW34 8-13'		Peristaltic Pump			X				X							NA	NA	NA	NA	NM							
QMCM-GW35	5/20/2017	QMCM-GW35 12'-17'	Duplicate omitted	Peristaltic Pump			X				X							NA	NA	NA	NA	NM							
QMCM-GW36	5/20/2017	QMCM-GW36 8'-13'		Peristaltic Pump			X				X							7.4	0.16	0.7	7.61	NM							
QMCM-SD10	6/9/2017	QMCM-SD10 0-0.5'		Vibracore Sampler					X			X	X	X	X														
	6/9/2017	QMCM-SD10 0.5-1'		Vibracore Sampler					X			X	X																
QMCM-SW05	6/9/2017	QMCM-SW05		Peristaltic Pump				X				X	X	X				18.5	0.105	35.6	7.06	NM							
Torch Lake																													
QMCM-SD12	6/11/2017	QMCM-SD12 0-1'		Vibracore Sampler					X				X	X															
	6/11/2017	QMCM-SD12 1-2.3'		Vibracore Sampler					X				X												X				
QMCM-SD13	6/11/2017	QMCM-SD13 0-3'		Vibracore Sampler					X				X	X															
	6/11/2017	QMCM-SD13 3-4.2'		Vibracore Sampler					X				X																
QMCM-SD14	6/11/2017	QMCM-SD14 0-0.3'		Vibracore Sampler					X				X	X															
QMCM-SD15	6/11/2017	QMCM-SD15 0-1.1'		Vibracore Sampler					X				X	X															
	6/11/2017	QMCM-SD15 1.1-2.9'		Vibracore Sampler					X				X																
QMCM-SD17	6/13/2017	QMCM-SD17 0-2'		Vibracore Sampler					X			X	X	X										X	X	X			
	6/13/2017	QMCM-SD17 2-4.2'		Vibracore Sampler					X				X																
QMCM-SD19	6/13/2017	QMCM-SD19 0-2.2'		Vibracore Sampler					X			X	X	X															
	6/13/2017	QMCM-SD19 2.2-4.3'		Vibracore Sampler					X				X																
QMCM-SD20	6/13/2017	QMCM-SD20 0-2.1'		Vibracore Sampler					X			X	X	X															
	6/13/2017	QMCM-SD20 2.1-4.25'		Vibracore Sampler					X				X																
QMCM-SD23	6/12/2017	QMCM-SD23 0-2'		Vibracore Sampler					X			X	X	X															
	6/12/2017	QMCM-SD23 2-4.25'		Vibracore Sampler					X				X																
QMCM-SD26	6/13/2017	QMCM-SD26 0-2.5'		Vibracore Sampler					X			X	X	X															
	6/13/2017	QMCM-SD26 2.5-5'		Vibracore Sampler					X				X																
QMCM-SD28	6/12/2017	QMCM-SD28 0-2'		Vibracore Sampler					X			X	X	X															
	6/12/2017	QMCM-SD28 2-4'		Vibracore Sampler					X				X																
QMCM-SD31	6/13/2017	QMCM-SD31 0-2.8'		Vibracore Sampler					X			X	X	X															
	6/13/2017	QMCM-SD31 2.8-5.6'		Vibracore Sampler					X				X																

TABLE 3-2
Sampling and Analysis Summary
Quincy Mining Company Mason 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
Torch Lake (continued)								
QMCM-SD33	6/12/2017	QMCM-SD33 0-2.5'	1706169	-88.457051254	47.145677793	Observation No. 11 - Drum on side	SILTY CLAY, reddish brown, soft, loose, wet to GRAVELLY SAND, reddish brown, coarse grain, poorly sorted	--
	6/12/2017	QMCM-SD33 2.5-5.1'	1706169			Observation No. 11 - Drum on side	SILTY CLAY, reddish brown, seam of black friable gravel sized slag at 3.25ft to SILTY SAND, brown, fine grain, well sorted, wet	--
QMCM-SD34	6/12/2017	QMCM-SD34 0-0.8'	1706169	-88.457089469	47.145464727	Observation No. 9 - Concrete slabs w/ rectangular opening	SILTY CLAY, reddish brown, loose, soft, saturated to GRAVELLY SAND, reddish brown, coarse grain, poorly sorted, trace fines	--
	6/12/2017	QMCM-SD34 0.8-2.5'	1706169			Observation No. 9 - Concrete slabs w/ rectangular opening	CLAY, reddish brown, loose, soft, wet, wood debris at 1.75ft to GRAVELLY SAND, reddish brown, coarse grain, poorly sorted, wet	--
QMCM-SD35	6/12/2017	QMCM-SD35 0-0.75'	1706169	-88.457132501	47.145036800	Observation No. 43 - Unknown debris	CLAYEY SILT, reddish brown, loose, soft, wet to GRAVELLY SAND, reddish brown, coarse grain, poorly sorted, firm wet	--
	6/12/2017	QMCM-SD35 0.75-1.5'	1706169			Observation No. 43 - Unknown debris	GRAVELLY SAND, reddish brown, coarse grain, poorly sorted, firm wet	--
QMCM-SD36	6/12/2017	QMCM-SD36 0-1.3'	1706170	-88.459241262	47.144653222	Observation No. 26 - Edge of something buried - contents of a former drum or a timber?	SILTY CLAY, reddish brown, loose, soft, wet to SILTY SAND, reddish brown, fine grain, well sorted, wet	--
	6/12/2017	QMCM-SD36 1.3-1.7'	1706170			Observation No. 26 - Edge of something buried - contents of a former drum or a timber?	GRAVELLY SAND, reddish brown, coarse grain, poorly sorted, wet	--
QMCM-SD38	6/12/2017	QMCM-SD38 0-0.5'	1706169	-88.457657222	47.144618429	Observation No. 7 - Strange surface appearance on sediments	GRAVELLY SAND, reddish brown, coarse grain, poorly sorted	--
QMCM-SD39	6/12/2017	QMCM-SD39 0-1.6'	1706169	-88.456799448	47.144598701	Observation No. 44 - Unknown debris-possible drums	SILTY SAND, reddish brown, fine grain, well sorted, loose, soft, wet	--
	6/12/2017	QMCM-SD39 1.6-3.75'	1706169			Observation No. 44 - Unknown debris-possible drums	SAND, reddish brown, fine grained, well sorted, firm, wet to CLAYEY SAND, red - brown mottled, fine grain, well sorted, soft	--
QMCM-SD40	6/12/2017	QMCM-SD40 0-0.6'	1706170	-88.459541619	47.144659739	Observation No. 33 - Quincy Dredge No. 2 - partially sunken near shoreline	GRAVEL and SAND, brown, coarse grain, small to large gravel, poorly sorted, wet	--
QMCM-SD41	6/12/2017	QMCM-SD41 0-0.3'	1706170	-88.459711839	47.144394086	Observation No. 33 - Quincy Dredge No. 2 - partially sunken near shoreline	GRAVELLY SAND	--
QMCM-SD42	6/12/2017	QMCM-SD42 0-1.3'	1706170	-88.459393784	47.144393588	Observation No. 33 - Quincy Dredge No. 2 - partially sunken near shoreline	SILTY SAND, brown, loose, soft, firming downward, wet	--
	6/12/2017	QMCM-SD42 1.3-2.75'	1706170			Observation No. 33 - Quincy Dredge No. 2 - partially sunken near shoreline	SILTY SAND, brown, loose, soft, firming downward, wet	--
QMCM-SD43	6/12/2017	QMCM-SD43 0-0.9'	1706170	-88.459251025	47.144495523	Observation No. 33 - Quincy Dredge No. 2 - partially sunken near shoreline	SILTY SAND, reddish brown, fin grain, soft to firm	--
	6/12/2017	QMCM-SD43 0.9-3'	1706170			Observation No. 33 - Quincy Dredge No. 2 - partially sunken near shoreline	SILTY SAND, reddish brown, fine grain, firm, less fines than above	--
QMCM-SD46	6/13/2017	QMCM-SD46 0-2.5'	1706170	-88.453960545	47.139613980	Observation No. 31 - Lake bottom has white appearance	SILTY CLAY, reddish brown, loose, soft	--
	6/13/2017	QMCM-SD46 2.5-5.2'	1706170			Observation No. 31 - Lake bottom has white appearance	SILTY CLAY, reddish brown, loose, soft to SAND, brown, medium grain, well sorted	--

TABLE 3-2
Sampling and Analysis Summary
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

					Sample Type/Matrix						Requested Laboratory Analyses							Water Quality Parameters					Duplicate Analyses						
Proposed Sampling Location	Sample Date	Field Sample Identification	Sample Notes	Sampling Method	Surface Soil	Subsurface Soil	Groundwater	Surface Water	Sediment	Drums, Containers, and Building Materials/SACM	VOCs	SVOCs	PCBs	Metals	Cyanide	Asbestos	Waste Characterization	Temperature (C°)	Conductivity (mS/cm)	Dissolved Oxygen (%)	pH	Turbidity (nTu)	VOCs	SVOCs	PCBs	Metals	Cyanide	Asbestos	Waste Characterization
Torch Lake (continued)																													
QMCM-SD33	6/12/2017	QMCM-SD33 0-2.5'		Vibracore Sampler					X			X	X	X															
	6/12/2017	QMCM-SD33 2.5-5.1'		Vibracore Sampler					X				X																
QMCM-SD34	6/12/2017	QMCM-SD34 0-0.8'		Vibracore Sampler					X				X	X															
	6/12/2017	QMCM-SD34 0.8-2.5'		Vibracore Sampler					X				X																
QMCM-SD35	6/12/2017	QMCM-SD35 0-0.75'		Vibracore Sampler					X				X	X															
	6/12/2017	QMCM-SD35 0.75-1.5'		Vibracore Sampler					X				X																
QMCM-SD36	6/12/2017	QMCM-SD36 0-1.3'		Vibracore Sampler					X			X	X	X										X	X	X			
	6/12/2017	QMCM-SD36 1.3-1.7'		Vibracore Sampler					X				X																
QMCM-SD38	6/12/2017	QMCM-SD38 0-0.5'		Vibracore Sampler					X				X	X															
QMCM-SD39	6/12/2017	QMCM-SD39 0-1.6'		Vibracore Sampler					X			X	X	X															
	6/12/2017	QMCM-SD39 1.6-3.75'		Vibracore Sampler					X				X																
QMCM-SD40	6/12/2017	QMCM-SD40 0-0.6'	Analyzed for SVOCs	Vibracore Sampler					X			X	X	X															
QMCM-SD41	6/12/2017	QMCM-SD41 0-0.3'	Sample is composite of two attempts both with a recovery of 0.3'	Vibracore Sampler					X				X	X															
QMCM-SD42	6/12/2017	QMCM-SD42 0-1.3'		Vibracore Sampler					X				X	X															
	6/12/2017	QMCM-SD42 1.3-2.75'	Duplicate added	Vibracore Sampler					X				X																
QMCM-SD43	6/12/2017	QMCM-SD43 0-0.9'		Vibracore Sampler					X				X	X															
	6/12/2017	QMCM-SD43 0.9-3'		Vibracore Sampler					X				X																
QMCM-SD46	6/13/2017	QMCM-SD46 0-2.5'		Vibracore Sampler					X				X	X															
	6/13/2017	QMCM-SD46 2.5-5.2'		Vibracore Sampler					X				X												X				

Table 3-2
Sampling and Analysis Summary
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Notes:

QMCM = Quincy Mining Company Mason Operations Area
SACM = Suspect Asbestos Containing Material
VOCs = Volatile Organic Compounds
SVOCs = Semi-Volatile Organic Compounds
PCBs = Polychlorinated Biphenyls
-- = Not Applicable
C° = Degrees Celsius
mS/cm = Millisiemens per centimeter
% = Percentage
nTU = Nephelometric turbidity units
NM = No measurement
ft = feet
X = Completed sample based on the sampling rationale and the horizontal and vertical location of the sample
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.
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 MDEQ Criteria at time of Project completion.

TABLE 5-1
Sample Analytical Summary - Suspect Asbestos Containing Material
Quincy Mining Company Mason 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
QUINCY STAMP MILLS AREA							
AS-1 (MDEQ 2013)	AS-1	9/10/2013	15%	chrysotile	--	Debris	--
AS-2 (MDEQ 2013)	AS-2	9/10/2013	< 1%		--	Roofing	--
AS-3 (MDEQ 2013)	AS-3	9/10/2013	< 1%		--	Mortar	--
AS-4 (MDEQ 2013)	AS-4	9/10/2013	< 1%		--	Tar Paper	--
AS-5 (MDEQ 2013)	AS-5	9/10/2013	< 1%		--	Mortar	--
QMCM-ASBBLK22A	QMCM-ASBBLK22A-052517	5/25/2017	ND		non-friable	Yellow Fire Bricks	1000CF
QMCM-ASBBLK22B	QMCM-ASBBLK22B-052517	5/25/2017	ND		non-friable	Yellow Fire Bricks	
QMCM-ASBBLK22C	QMCM-ASBBLK22C-052517	5/25/2017	ND		non-friable	Yellow Fire Bricks	
QMCM-ASBBLK23A	QMCM-ASBBLK23A-052517	5/25/2017	85%	chrysotile	friable	Rope Gasket	2LF, attached to rusted metal flange
QMCM-ASBBLK23B	QMCM-ASBBLK23B-052517	5/25/2017	--		friable	Rope Gasket	sample not analyzed due to prior positive series
QMCM-ASBBLK23C	QMCM-ASBBLK23C-052517	5/25/2017	--		friable	Rope Gasket	sample not analyzed due to prior positive series
QMCM-ASBBLK24A	QMCM-ASBBLK24A-052517	5/25/2017	ND		non-friable	Silo Shingle	90SF
QMCM-ASBBLK24B	QMCM-ASBBLK24B-052517	5/25/2017	ND		non-friable	Silo Shingle	
QMCM-ASBBLK24C	QMCM-ASBBLK24C-052517	5/25/2017	ND		non-friable	Silo Shingle	
QMCM-ASBBLK25A	QMCM-ASBBLK25A-052517	5/25/2017	50%	chrysotile	friable	Gray Mastic	20SF
QMCM-ASBBLK25B	QMCM-ASBBLK25B-052517	5/25/2017	--		friable	Gray Mastic	sample not analyzed due to prior positive series
QMCM-ASBBLK25C	QMCM-ASBBLK25C-052517	5/25/2017	--		friable	Gray Mastic	sample not analyzed due to prior positive series
QMCM-ASBBLK26A	QMCM-ASBBLK26A-052517	5/25/2017	ND		non-friable	Black Fibrous Belt	15SF
QMCM-ASBBLK26B	QMCM-ASBBLK26B-052517	5/25/2017	ND		non-friable	Black Fibrous Belt	
QMCM-ASBBLK26C	QMCM-ASBBLK26C-052517	5/25/2017	ND		non-friable	Black Fibrous Belt	
QMCM-ASBBLK27A	QMCM-ASBBLK27A-052517	5/25/2017	ND		non-friable	Gray Gasket	3LF
QMCM-ASBBLK28A	QMCM-ASBBLK28A-052517	5/25/2017	ND		non-friable	Felt Roofing W/ Mastic	25SF
QMCM-ASBBLK28B	QMCM-ASBBLK28B-052517	5/25/2017	ND		non-friable	Felt Roofing W/ Mastic	
QMCM-ASBBLK28C	QMCM-ASBBLK28C-052517	5/25/2017	ND		non-friable	Felt Roofing W/ Mastic	
QMCM-ASBBLK29A	QMCM-ASBBLK29A-052517	5/25/2017	ND		non-friable	Black Tar Roofing	25SF, potentially more buried
QMCM-ASBBLK29B	QMCM-ASBBLK29B-052517	5/25/2017	ND		non-friable	Black Tar Roofing	
QMCM-ASBBLK29C	QMCM-ASBBLK29C-052517	5/25/2017	ND		non-friable	Black Tar Roofing	
QMCM-ASBBLK30A	QMCM-ASBBLK30A-052517	5/25/2017	ND		non-friable	Woven Hose	10SF
QMCM-ASBBLK30B	QMCM-ASBBLK30B-052517	5/25/2017	ND		non-friable	Woven Hose	
QMCM-ASBBLK31A	QMCM-ASBBLK31A-052517	5/25/2017	ND		non-friable	Black/Metallic Roofing	150SF, attached to wooden boat structure
QMCM-ASBBLK31B	QMCM-ASBBLK31B-052517	5/25/2017	ND		non-friable	Black/Metallic Roofing	
QMCM-ASBBLK31C	QMCM-ASBBLK31C-052517	5/25/2017	ND		non-friable	Black/Metallic Roofing	
QMCM-ASBBLK32A	QMCM-ASBBLK32A-052517	5/25/2017	ND		non-friable	Black Tar Roofing	25SF, potentially more buried
QMCM-ASBBLK32B	QMCM-ASBBLK32B-052517	5/25/2017	ND		non-friable	Black Tar Roofing	
QMCM-ASBBLK32C	QMCM-ASBBLK32C-052517	5/25/2017	ND		non-friable	Black Tar Roofing	
QMCM-ASBBLK33A	QMCM-ASBBLK33A-052517	5/25/2017	ND		non-friable	Black Wire Wrap	10LF
QMCM-ASBBLK34A	QMCM-ASBBLK34A-052517	5/25/2017	ND		non-friable	Woven Layers	10SF
QMCM-ASBBLK35A	QMCM-ASBBLK35A-052517	5/25/2017	ND		non-friable	Black Layered Felt Paper	5SF, attached to wooden board near brick wall
QMCM-ASBBLK36A	QMCM-ASBBLK36A-052517	5/25/2017	ND		non-friable	Conveyor Belt	each tube is approximately 3'x3'
QMCM-ASBBLK36B	QMCM-ASBBLK36B-052517	5/25/2017	ND		non-friable	Conveyor Belt	

TABLE 5-1
Sample Analytical Summary - Suspect Asbestos Containing Material
Quincy Mining Company Mason 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
QUINCY STAMP MILLS AREA (continued)							
QMCM-ASBBLK37A	QMCM-ASBBLK37A-052517	5/25/2017	90%	chrysotile	non-friable	Gray Woven Tubing	15LF, potentially more buried
QMCM-ASBBLK37B	QMCM-ASBBLK37B-052517	5/25/2017	--		non-friable	Gray Woven Tubing	sample not analyzed due to prior positive series
QMCM-ASBBLK37C	QMCM-ASBBLK37C-052517	5/25/2017	--		non-friable	Gray Woven Tubing	sample not analyzed due to prior positive series
QMCM-ASBBLK38A	QMCM-ASBBLK38A-052517	5/25/2017	ND		non-friable	White Woven Screen	2SF
QMCM-ASBBLK39A	QMCM-ASBBLK39A-052517	5/25/2017	70%	chrysotile	non-friable	Black Tape Wrapped Hose	15LF, potentially more buried
QMCM-ASBBLK39B	QMCM-ASBBLK39B-052517	5/25/2017	--		non-friable	Black Tape Wrapped Hose	sample not analyzed due to prior positive series
QMCM-ASBBLK39C	QMCM-ASBBLK39C-052517	5/25/2017	--		non-friable	Black Tape Wrapped Hose	sample not analyzed due to prior positive series
QMCM-ASBBLK40A	QMCM-ASBBLK40A-052517	5/25/2017	ND		non-friable	Black Linoleum	5SF, potentially more buried
QMCM-ASBBLK41A	QMCM-ASBBLK41A-052517	5/25/2017	ND		non-friable	White Linoleum	5SF, potentially more buried
QMCM-ASBBLK42A	QMCM-ASBBLK42A-052517	5/25/2017	85%	chrysotile	friable	White Layered Gasket	1SF
QMCM-ASBBLK42B	QMCM-ASBBLK42B-052517	5/25/2017	--		friable	White Layered Gasket	sample not analyzed due to prior positive series
QMCM-ASBBLK42C	QMCM-ASBBLK42C-052517	5/25/2017	--		friable	White Layered Gasket	sample not analyzed due to prior positive series
QMCM-ASBBLK43A	QMCM-ASBBLK43A-052517	5/25/2017	18%	chrysotile	non-friable	Transite Tile	5SF, scattered pieces
QMCM-ASBBLK43B	QMCM-ASBBLK43B-052517	5/25/2017	--		non-friable	Transite Tile	sample not analyzed due to prior positive series
QMCM-ASBBLK43C	QMCM-ASBBLK43C-052517	5/25/2017	--		non-friable	Transite Tile	sample not analyzed due to prior positive series
QMCM-ASBBLK44A	QMCM-ASBBLK44A-052517	5/25/2017	ND		non-friable	Black Transite Tile	2SF, scattered pieces
QMCM-ASBBLK44B	QMCM-ASBBLK44B-052517	5/25/2017	ND		non-friable	Black Transite Tile	
QMCM-ASBBLK44C	QMCM-ASBBLK44C-052517	5/25/2017	ND		non-friable	Black Transite Tile	
QMCM-ASBBLK45A	QMCM-ASBBLK45A-052517	5/25/2017	5%	chrysotile	friable	Metallic/Black Roofing	10SF, scattered along shoreline
QMCM-ASBBLK45B	QMCM-ASBBLK45B-052517	5/25/2017	--		friable	Metallic/Black Roofing	sample not analyzed due to prior positive series
QMCM-ASBBLK45C	QMCM-ASBBLK45C-052517	5/25/2017	--		friable	Metallic/Black Roofing	sample not analyzed due to prior positive series
QMCM-ASBBLK58A	QMCM-ASBBLK58A-052517	5/25/2017	ND		non-friable	Black Asphaltic Tar Roofing	50SF, scattered near M-26
QMCM-ASBBLK58B	QMCM-ASBBLK58B-052517	5/25/2017	ND		non-friable	Black Asphaltic Tar Roofing	
QMCM-ASBBLK58C	QMCM-ASBBLK58C-052517	5/25/2017	ND		non-friable	Black Asphaltic Tar Roofing	
QMCM-ASBBLK59A	QMCM-ASBBLK59A-052517	5/25/2017	15%	chrysotile	friable	Black Roofing W/ Specks	25SF, nailed to board, potentially more buried
QMCM-ASBBLK59B	QMCM-ASBBLK59B-052517	5/25/2017	--		friable	Black Roofing W/ Specks	sample not analyzed due to prior positive series
QMCM-ASBBLK59C	QMCM-ASBBLK59C-052517	5/25/2017	--		friable	Black Roofing W/ Specks	sample not analyzed due to prior positive series
QMCM-ASBBLK60A	QMCM-ASBBLK60A-052517	5/25/2017	85%	chrysotile	friable	Dark Gray/White TSI	scattered piles within area totaling 6000SF
QMCM-ASBBLK60B	QMCM-ASBBLK60B-052517	5/25/2017	--		friable	Dark Gray/White TSI	sample not analyzed due to prior positive series
QMCM-ASBBLK60C	QMCM-ASBBLK60C-052517	5/25/2017	--		friable	Dark Gray/White TSI	sample not analyzed due to prior positive series
QMCM-ASBBLK61A	QMCM-ASBBLK61A-052517	5/25/2017	ND		non-friable	Woven Material W/ Yellow	3SF
QMCM-ASBBLK62A	QMCM-ASBBLK62A-052517	5/25/2017	ND		non-friable	Red/Black Woven Fabric	20LF
QMCM-ASBBLK62B	QMCM-ASBBLK62B-052517	5/25/2017	ND		non-friable	Red/Black Woven Fabric	
QMCM-ASBBLK62C	QMCM-ASBBLK62C-052517	5/25/2017	ND		non-friable	Red/Black Woven Fabric	
QMCM-ASBBLK63A	QMCM-ASBBLK63A-052517	5/25/2017	ND		non-friable	Gray Layered Fabric	75SF
QMCM-ASBBLK63B	QMCM-ASBBLK63B-052517	5/25/2017	ND		non-friable	Gray Layered Fabric	
QMCM-ASBBLK63C	QMCM-ASBBLK63C-052517	5/25/2017	ND		non-friable	Gray Layered Fabric	
QMCM-ASBBLK64A	QMCM-ASBBLK64A-052517	5/25/2017	85%	chrysotile	friable	Fire Door TSI	40SF
QMCM-ASBBLK64B	QMCM-ASBBLK64B-052517	5/25/2017	--		friable	Fire Door TSI	sample not analyzed due to prior positive series
QMCM-ASBBLK64C	QMCM-ASBBLK64C-052517	5/25/2017	--		friable	Fire Door TSI	sample not analyzed due to prior positive series

TABLE 5-1
Sample Analytical Summary - Suspect Asbestos Containing Material
Quincy Mining Company Mason 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
QUINCY STAMP MILLS AREA (continued)							
QMCM-ASBBLK65A	QMCM-ASBBLK65A-052517	5/25/2017	ND		non-friable	Black/Gray Shingles	50SF
QMCM-ASBBLK65B	QMCM-ASBBLK65B-052517	5/25/2017	ND		non-friable	Black/Gray Shingles	
QMCM-ASBBLK65C	QMCM-ASBBLK65C-052517	5/25/2017	ND		non-friable	Black/Gray Shingles	
QMCM-ASBBLK66A	QMCM-ASBBLK66A-052517	5/25/2017	ND		non-friable	White Belting	5SF
QMCM-ASBBLK67A	QMCM-ASBBLK67A-052617	5/26/2017	ND		non-friable	Window Glazing	20LF
QMCM-ASBBLK67B	QMCM-ASBBLK67B-052617	5/26/2017	ND		non-friable	Window Glazing	
QMCM-ASBBLK67C	QMCM-ASBBLK67C-052617	5/26/2017	ND		non-friable	Window Glazing	
QMCM-ASBBLK68A	QMCM-ASBBLK68A-052617	5/26/2017	ND		non-friable	Slate Sheeting	5SF, large sheet was not observed after recon activities
QMCM-ASBBLK68B	QMCM-ASBBLK68B-052617	5/26/2017	ND		non-friable	Slate Sheeting	
QMCM-ASBBLK68C	QMCM-ASBBLK68C-052617	5/26/2017	ND		non-friable	Slate Sheeting	
QMCM-ASBBLK69A	QMCM-ASBBLK69A-052617	5/26/2017	ND		non-friable	Black Fabric Tubing	5LF, potentially more buried
QMCM-ASBBLK69B	QMCM-ASBBLK69B-052617	5/26/2017	ND		non-friable	Black Fabric Tubing	
QMCM-ASBBLK69C	QMCM-ASBBLK69C-052617	5/26/2017	ND		non-friable	Black Fabric Tubing	
QMCM-ASBBLK70A	QMCM-ASBBLK70A-052617	5/26/2017	90%	chrysotile	friable	White/Black Fabric	6SF, potentially more buried
QMCM-ASBBLK71A	QMCM-ASBBLK71A-052617	5/26/2017	ND		non-friable	Black Foundation Mastic	5SF
QMCM-ASBBLK71B	QMCM-ASBBLK71B-052617	5/26/2017	ND		non-friable	Black Foundation Mastic	
QMCM-ASBBLK71C	QMCM-ASBBLK71C-052617	5/26/2017	ND		non-friable	Black Foundation Mastic	
QMCM-ASBBLK72A	QMCM-ASBBLK72A-052617	5/26/2017	ND		non-friable	Loose Tar Mastic	3SF
QMCM-ASBBLK72B	QMCM-ASBBLK72B-052617	5/26/2017	ND		non-friable	Loose Tar Mastic	
QMCM-ASBBLK72C	QMCM-ASBBLK72C-052617	5/26/2017	ND		non-friable	Loose Tar Mastic	
QMCM-ASBBLK73A	QMCM-ASBBLK73A-052617	5/26/2017	ND		non-friable	Gray Woven Material	20SF, scattered in area
QMCM-ASBBLK73B	QMCM-ASBBLK73B-052617	5/26/2017	ND		non-friable	Gray Woven Material	
QMCM-ASBBLK73C	QMCM-ASBBLK73C-052617	5/26/2017	ND		non-friable	Gray Woven Material	
QMCM-ASBBLK74A	QMCM-ASBBLK74A-052617	5/26/2017	85%	chrysotile	friable	Beige TSI	scattered piles within area totaling 1000SF
QMCM-ASBBLK74B	QMCM-ASBBLK74B-052617	5/26/2017	--		friable	Beige TSI	sample not analyzed due to prior positive series
QMCM-ASBBLK74C	QMCM-ASBBLK74C-052617	5/26/2017	--		friable	Beige TSI	sample not analyzed due to prior positive series
QMCM-ASBBLK75A	QMCM-ASBBLK75A-052617	5/26/2017	ND		friable	Black Fibrous Material	3SF
QMCM-ASBBLK75B	QMCM-ASBBLK75B-052617	5/26/2017	ND		friable	Black Fibrous Material	
QMCM-ASBBLK75C	QMCM-ASBBLK75C-052617	5/26/2017	2%	chrysotile	friable	Black Fibrous Material	
QMCM-ASBBLK76A	QMCM-ASBBLK76A-052617	5/26/2017	12%	chrysotile	friable	Black Mesh Imprint Felt Paper	15SF, scattered in area
QMCM-ASBBLK76B	QMCM-ASBBLK76B-052617	5/26/2017	--		friable	Black Mesh Imprint Felt Paper	sample not analyzed due to prior positive series
QMCM-ASBBLK76C	QMCM-ASBBLK76C-052617	5/26/2017	--		friable	Black Mesh Imprint Felt Paper	sample not analyzed due to prior positive series
QMCM-ASBBLK77A	QMCM-ASBBLK77A-052617	5/26/2017	ND		non-friable	Red Woven Fabric	10SF, scattered in area
QMCM-ASBBLK77B	QMCM-ASBBLK77B-052617	5/26/2017	ND		non-friable	Red Woven Fabric	
QMCM-ASBBLK77C	QMCM-ASBBLK77C-052617	5/26/2017	ND		non-friable	Red Woven Fabric	
QMCM-ASBBLK78A	QMCM-ASBBLK78A-052617	5/26/2017	ND		non-friable	Black Woven Material	5SF
QMCM-ASBBLK78B	QMCM-ASBBLK78B-052617	5/26/2017	ND		non-friable	Black Woven Material	
QMCM-ASBBLK78C	QMCM-ASBBLK78C-052617	5/26/2017	ND		non-friable	Black Woven Material	
QMCM-ASBBLK79A	QMCM-ASBBLK79A-052617	5/26/2017	ND		non-friable	Black Mastic W/ Fabric	1SF

TABLE 5-1
Sample Analytical Summary - Suspect Asbestos Containing Material
Quincy Mining Company Mason 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
QUINCY STAMP MILLS AREA (continued)							
QMCM-ASBBLK80A	QMCM-ASBBLK80A-052617	5/26/2017	45%	chrysotile	non-friable	Layered Gaskets	15LF, potentially more buried
QMCM-ASBBLK80B	QMCM-ASBBLK80B-052617	5/26/2017	--		non-friable	Layered Gaskets	sample not analyzed due to prior positive series
QMCM-ASBBLK80C	QMCM-ASBBLK80C-052617	5/26/2017	--		non-friable	Layered Gaskets	sample not analyzed due to prior positive series
QMCM-ASBBLK81A	QMCM-ASBBLK81A-052617	5/26/2017	ND		non-friable	Gray Woven Fabric	5SF
QMCM-ASBBLK82A	QMCM-ASBBLK82A-052617	5/26/2017	ND		non-friable	Gray/Brown Woven Fabric	5SF
QMCM-ASBBLK83A	QMCM-ASBBLK83A-052617	5/26/2017	90%	chrysotile	friable	Gray Coated Felt Paper	5SF, potentially more buried
QMCM-ASBBLK83A	QMCM-ASBBLK83A-052617	5/26/2017	2%	crocidolite	friable	Gray Coated Felt Paper	5SF, potentially more buried
QMCM-ASBBLK84A	QMCM-ASBBLK84A-052617	5/26/2017	60%	chrysotile	friable	Felt Paper Roofing	10SF, small pieces scattered in area
QMCM-ASBBLK85A	QMCM-ASBBLK85A-052617	5/26/2017	ND		non-friable	Light Yellow Fire Bricks	800CF
QMCM-ASBBLK85B	QMCM-ASBBLK85B-052617	5/26/2017	ND		non-friable	Light Yellow Fire Bricks	
QMCM-ASBBLK85C	QMCM-ASBBLK85C-052617	5/26/2017	ND		non-friable	Light Yellow Fire Bricks	
QMCM-ASBBLK86A	QMCM-ASBBLK86A-052617	5/26/2017	70%	chrysotile	non-friable	Metallic Roofing	25SF, scattered in area, potentially more
QMCM-ASBBLK87A	QMCM-ASBBLK87A-052617	5/26/2017	ND		friable	Tar Pebble Felt Paper Roofing	35SF
QMCM-ASBBLK87B	QMCM-ASBBLK87B-052617	5/26/2017	ND		friable	Tar Pebble Felt Paper Roofing	
QMCM-ASBBLK87C	QMCM-ASBBLK87C-052617	5/26/2017	ND		friable	Tar Pebble Felt Paper Roofing	
QUINCY RECLAMATION PLANT							
QMCM-ASBBLK05A	QMCM-ASBBLK05A-052417	5/24/2017	ND		non-friable	Black Wire Wrap	5LF visible, potentially more buried
QMCM-ASBBLK05B	QMCM-ASBBLK05B-052417	5/24/2017	ND		non-friable	Black Wire Wrap	
QMCM-ASBBLK05C	QMCM-ASBBLK05C-052417	5/24/2017	ND		non-friable	Black Wire Wrap	
QMCM-ASBBLK06A	QMCM-ASBBLK06A-052417	5/24/2017	4%	chrysotile	friable	Metallic Paint Roofing	mixed with debris and found scattered throughout foundational area
QMCM-ASBBLK06B	QMCM-ASBBLK06B-052417	5/24/2017	--		friable	Metallic Paint Roofing	sample not analyzed due to prior positive series
QMCM-ASBBLK06C	QMCM-ASBBLK06C-052417	5/24/2017	--		friable	Metallic Paint Roofing	sample not analyzed due to prior positive series
QMCM-ASBBLK07A	QMCM-ASBBLK07A-052417	5/24/2017	20%	chrysotile	friable	Silver Felt Paper	130SF, found around inside of circular concrete structures
QMCM-ASBBLK07B	QMCM-ASBBLK07B-052417	5/24/2017	--		friable	Silver Felt Paper	sample not analyzed due to prior positive series
QMCM-ASBBLK07C	QMCM-ASBBLK07C-052417	5/24/2017	--		friable	Silver Felt Paper	sample not analyzed due to prior positive series
QMCM-ASBBLK08A	QMCM-ASBBLK08A-052417	5/24/2017	ND		friable	Brownish Fibrous String	25SF, found between wooden boards and concrete structure near silver felt paper
QMCM-ASBBLK08B	QMCM-ASBBLK08B-052417	5/24/2017	ND		friable	Brownish Fibrous String	
QMCM-ASBBLK08C	QMCM-ASBBLK08C-052417	5/24/2017	ND		friable	Brownish Fibrous String	
QMCM-ASBBLK09A	QMCM-ASBBLK09A-052417	5/24/2017	30%	chrysotile	friable	Brown TSI	2SF of material is visible on wooden board, more may be buried within debris
QMCM-ASBBLK10A	QMCM-ASBBLK10A-052417	5/24/2017	ND		non-friable	Black Tar Mastic	100SF, found on NE corner of concrete structures
QMCM-ASBBLK10B	QMCM-ASBBLK10B-052417	5/24/2017	ND		non-friable	Black Tar Mastic	
QMCM-ASBBLK10C	QMCM-ASBBLK10C-052417	5/24/2017	ND		non-friable	Black Tar Mastic	
QMCM-ASBBLK11A	QMCM-ASBBLK11A-052417	5/24/2017	ND		non-friable	Rubber Coated Fabric	10SF
QMCM-ASBBLK11B	QMCM-ASBBLK11B-052417	5/24/2017	ND		non-friable	Rubber Coated Fabric	
QMCM-ASBBLK11C	QMCM-ASBBLK11C-052417	5/24/2017	ND		non-friable	Rubber Coated Fabric	
QMCM-ASBBLK12A	QMCM-ASBBLK12A-052417	5/24/2017	ND		non-friable	Black Tubing	20LF
QMCM-ASBBLK12B	QMCM-ASBBLK12B-052417	5/24/2017	ND		non-friable	Black Tubing	
QMCM-ASBBLK12C	QMCM-ASBBLK12C-052417	5/24/2017	ND		non-friable	Black Tubing	

TABLE 5-1
Sample Analytical Summary - Suspect Asbestos Containing Material
Quincy Mining Company Mason 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
QUINCY RECLAMATION PLANT (continued)							
QMCM-ASBBLK13A	QMCM-ASBBLK13A-052417	5/24/2017	ND		non-friable	Black Wrapped Tubing	10LF
QMCM-ASBBLK13B	QMCM-ASBBLK13B-052417	5/24/2017	ND		non-friable	Black Wrapped Tubing	
QMCM-ASBBLK13C	QMCM-ASBBLK13C-052417	5/24/2017	ND		non-friable	Black Wrapped Tubing	
QMCM-ASBBLK14A	QMCM-ASBBLK14A-052417	5/24/2017	ND		non-friable	Woven Wrap	3LF
QMCM-ASBBLK14B	QMCM-ASBBLK14B-052417	5/24/2017	ND		non-friable	Woven Wrap	
QMCM-ASBBLK14C	QMCM-ASBBLK14C-052417	5/24/2017	ND		non-friable	Woven Wrap	
QMCM-ASBBLK15A	QMCM-ASBBLK15A-052417	5/24/2017	ND		non-friable	Green Shingle	5SF
QMCM-ASBBLK15B	QMCM-ASBBLK15B-052417	5/24/2017	ND		non-friable	Green Shingle	
QMCM-ASBBLK15C	QMCM-ASBBLK15C-052417	5/24/2017	ND		non-friable	Green Shingle	
QMCM-ASBBLK16A	QMCM-ASBBLK16A-052417	5/24/2017	ND		friable	Black Felt Paper Roofing	100SF, scattered throughout Shore Plant foundational area
QMCM-ASBBLK16B	QMCM-ASBBLK16B-052417	5/24/2017	ND		friable	Black Felt Paper Roofing	
QMCM-ASBBLK16C	QMCM-ASBBLK16C-052417	5/24/2017	3%	chrysotile	friable	Black Felt Paper Roofing	
QMCM-ASBBLK17A	QMCM-ASBBLK17A-052417	5/24/2017	80%	chrysotile	friable	White TSI	3SF, potentially more buried in wood debris
QMCM-ASBBLK17B	QMCM-ASBBLK17B-052417	5/24/2017	--		friable	White TSI	sample not analyzed due to prior positive series
QMCM-ASBBLK17C	QMCM-ASBBLK17C-052417	5/24/2017	--		friable	White TSI	sample not analyzed due to prior positive series
QMCM-ASBBLK18A	QMCM-ASBBLK18A-052417	5/24/2017	ND		non-friable	Black Solid Tubing	7LF
QMCM-ASBBLK18B	QMCM-ASBBLK18B-052417	5/24/2017	ND		non-friable	Black Solid Tubing	
QMCM-ASBBLK18C	QMCM-ASBBLK18C-052417	5/24/2017	ND		non-friable	Black Solid Tubing	
QMCM-ASBBLK19A	QMCM-ASBBLK19A-052417	5/24/2017	ND		non-friable	White Wiring Wrap	2LF
QMCM-ASBBLK20A	QMCM-ASBBLK20A-052417	5/24/2017	ND		non-friable	Black Gasket	5SF
QMCM-ASBBLK20B	QMCM-ASBBLK20B-052417	5/24/2017	ND		non-friable	Black Gasket	
QMCM-ASBBLK20C	QMCM-ASBBLK20C-052417	5/24/2017	ND		non-friable	Black Gasket	
QMCM-ASBBLK21A	QMCM-ASBBLK21A-052417	5/24/2017	20%	chrysotile	non-friable	Black Caulking	300LF, surrounding wooden pits
QMCM-ASBBLK21B	QMCM-ASBBLK21B-052417	5/24/2017	--		non-friable	Black Caulking	sample not analyzed due to prior positive series
QMCM-ASBBLK21C	QMCM-ASBBLK21C-052417	5/24/2017	--		non-friable	Black Caulking	sample not analyzed due to prior positive series
QMCM-ASBBLK46A	QMCM-ASBBLK46A-052517	5/25/2017	ND		non-friable	Black Gasket	1SF
QMCM-ASBBLK47A	QMCM-ASBBLK47A-052517	5/25/2017	ND		non-friable	Black Fabric Tubing	10LF
QMCM-ASBBLK47B	QMCM-ASBBLK47B-052517	5/25/2017	ND		non-friable	Black Fabric Tubing	
QMCM-ASBBLK47C	QMCM-ASBBLK47C-052517	5/25/2017	ND		non-friable	Black Fabric Tubing	
QMCM-ASBBLK48A	QMCM-ASBBLK48A-052517	5/25/2017	ND		non-friable	Gray Woven Fabric	15SF
QMCM-ASBBLK48B	QMCM-ASBBLK48B-052517	5/25/2017	ND		non-friable	Gray Woven Fabric	
QMCM-ASBBLK48C	QMCM-ASBBLK48C-052517	5/25/2017	ND		non-friable	Gray Woven Fabric	
QMCM-ASBBLK49A	QMCM-ASBBLK49A-052517	5/25/2017	ND		non-friable	Coated Fabric Gasket	1SF
QMCM-ASBBLK50A	QMCM-ASBBLK50A-052517	5/25/2017	ND		non-friable	Red/Gray Belting	1SF
QMCM-ASBBLK51A	QMCM-ASBBLK51A-052517	5/25/2017	ND		non-friable	Asphaltic Roofing	20SF
QMCM-ASBBLK51B	QMCM-ASBBLK51B-052517	5/25/2017	ND		non-friable	Asphaltic Roofing	
QMCM-ASBBLK51C	QMCM-ASBBLK51C-052517	5/25/2017	ND		non-friable	Asphaltic Roofing	
QMCM-ASBBLK52A	QMCM-ASBBLK52A-052517	5/25/2017	ND		non-friable	Black Felt Paper Roofing	25SF
QMCM-ASBBLK52B	QMCM-ASBBLK52B-052517	5/25/2017	ND		non-friable	Black Felt Paper Roofing	
QMCM-ASBBLK52C	QMCM-ASBBLK52C-052517	5/25/2017	ND		non-friable	Black Felt Paper Roofing	

TABLE 5-1
Sample Analytical Summary - Suspect Asbestos Containing Material
Quincy Mining Company Mason 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
QUINCY RECLAMATION PLANT (continued)							
QMCM-ASBBLK53A	QMCM-ASBBLK53A-052517	5/25/2017	4%	chrysotile	friable	Felt Paper W/ Silver Paint	15SF, potentially more buried
QMCM-ASBBLK53B	QMCM-ASBBLK53B-052517	5/25/2017	–		friable	Felt Paper W/ Silver Paint	sample not analyzed due to prior positive series
QMCM-ASBBLK53C	QMCM-ASBBLK53C-052517	5/25/2017	–		friable	Felt Paper W/ Silver Paint	sample not analyzed due to prior positive series
QMCM-ASBBLK54A	QMCM-ASBBLK54A-052517	5/25/2017	ND		non-friable	Green Floral Linoleum	10SF
QMCM-ASBBLK55A	QMCM-ASBBLK55A-052517	5/25/2017	ND		non-friable	Green Patterned Linoleum	10SF
QMCM-ASBBLK56A	QMCM-ASBBLK56A-052517	5/25/2017	ND		non-friable	Red Patterned Linoleum	10SF
QMCM-ASBBLK57A	QMCM-ASBBLK57A-052517	5/25/2017	ND		non-friable	Pink Layered Linoleum	10SF
QUINCY STAMP SANDS AREA							
QMCM-ASBBLK01A	QMCM-ASBBLK01A-052417	5/24/2017	18%	chrysotile	non-friable	Transite Siding	3 SF, potentially more buried
QMCM-ASBBLK01B	QMCM-ASBBLK01B-052417	5/24/2017	–		non-friable	Transite Siding	sample not analyzed due to prior positive series
QMCM-ASBBLK01C	QMCM-ASBBLK01C-052417	5/24/2017	–		non-friable	Transite Siding	sample not analyzed due to prior positive series
QMCM-ASBBLK02A	QMCM-ASBBLK02A-052417	5/24/2017	ND		non-friable	Black Tar Roofing	150SF, buried near wooden floorboard
QMCM-ASBBLK02B	QMCM-ASBBLK02B-052417	5/25/2017	ND		non-friable	Black Tar Roofing	
QMCM-ASBBLK02C	QMCM-ASBBLK02C-052417	5/26/2017	ND		non-friable	Black Tar Roofing	
QMCM-ASBBLK03A	QMCM-ASBBLK03A-052417	5/24/2017	ND		non-friable	Conveyor Belt	each tube is approximately 3'x3'
QMCM-ASBBLK03B	QMCM-ASBBLK03B-052417	5/24/2017	ND		non-friable	Conveyor Belt	
QMCM-ASBBLK03C	QMCM-ASBBLK03C-052417	5/24/2017	ND		non-friable	Conveyor Belt	
QMCM-ASBBLK04A	QMCM-ASBBLK04A-052417	5/24/2017	3%	chrysotile	non-friable	Metallic Roofing	buried material, with wooden floorboard approximately 10'x15'
QMCM-ASBBLK04B	QMCM-ASBBLK04B-052417	5/24/2017	–		non-friable	Metallic Roofing	sample not analyzed due to prior positive series
QMCM-ASBBLK04C	QMCM-ASBBLK04C-052417	5/24/2017	–		non-friable	Metallic Roofing	sample not analyzed due to prior positive series

– = Not analyzed
ND = Not detected
SF = Square feet
LF = Linear feet
CF = Cubic feet

Results greater than the National Emissions Standard for Hazardous Air Pollutants (NESHAP) and MDEQ Particulate Soil Inhalation Criteria of 1% are highlighted yellow

Evaluation based on MDEQ Criteria at time of Project completion.

TABLE 5-2
Sample Analytical Summary - Abandoned Container, Residual Process Material, and Waste
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY STAMP MILLS AREA											
Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	QMCM-DM02		QMCM-DM03		QMCM-RPM01		QMCM-RPM04		QMCM-RPM05		QMCM-RPM06	
Field Sample ID									QMCM - DM02-0"-6"		QMCM - DM03-0"-6"		QMCM - RPM01-0"-6"		QMCM - RPM04-0"-6"		QMCM - RPM05-0"-6"		QMCM - RPM06-0"-6"	
Sample Date									05/17/17		05/17/17		05/19/17		05/16/17		05/16/17		05/16/17	
Sample Interval (bgs)									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									Medium to coarse grained granular substance, appears sand-like		White and beige semi-hardened material in gravel sized chunks, cohesive with applied pressure		Grey fine-grained sand material with finer silt. Likely tailings.		Black tar-like and greasy substance, contains fibrous material, hardened on top where exposed to air, softer underneath		Yellow/orange cake-like material in small pieces, found on concrete foundation floor, mixed with soil, gravel, wood debris		Brown silty sand with some clay, cohesive, wet	
									Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Inorganics - Metals (mg/kg)																				
ANTIMONY	7440-36-0	1.2 (X)	4.3	13,000	180	4.3	5,900	670	–	–	–	–	–	–	–	–	–	–	–	–
ARSENIC	7440-38-2	4.6	4.6	720	7.6	4.6	910	37	2.1	–	1.3	–	<4.4 U	–	4.5	–	16	[2,4,10,11]	<4.3 UJ	–
BARIUM	7440-39-3	130	1,300 (G)	330,000	37,000	1,300	150,000	130,000	13	–	7.4	–	12	–	2,600	[2,4,11]	3,500	[2,4,11]	40	–
BERYLLIUM	7440-41-7	4.6 (G)	51	1,300	410	51	590	1,600	–	–	–	–	–	–	–	–	–	–	–	–
CADMIUM	7440-43-9	1.6 (G,X)	6.0	1,700	550	6.0	2,200	2,100	<0.86 UJ	–	<0.9 U	–	<8.8 UJ	–	2.6	[2]	1.9	[2]	<8.6 UJ	–
CHROMIUM	7440-47-3	1,200,000 (G,H,X)	1,000,000 (D,H)	330,000 (H)	790,000 (H)	1,000,000 (D,H)	150,000 (H)	1,000,000 (D,H)	2.3	–	10	–	31	–	8.7	–	18	–	40	–
COBALT	7440-48-4	2.0	0.8	13,000	2,600	2.0	5,900	9,000	–	–	–	–	–	–	–	–	–	–	–	–
COPPER	7440-50-8	32 (G)	5,800	130,000	20,000	5,800	59,000	73,000	–	–	–	–	–	–	–	–	–	–	–	–
IRON	7439-89-6	NA	12,000 (B)	ID	160,000	12,000 (B)	ID	580,000	–	–	–	–	–	–	–	–	–	–	–	–
LEAD	7439-92-1	1,900 (G,X)	700	100,000	400	700	44,000	900 (DD)	5.3	–	5.2	–	14	–	13,000	[2,4,10,11,17]	8,500	[2,4,10,11,17]	24	–
MANGANESE	7439-96-5	440 (B,G,X)	440 (B)	3,300	25,000	440 (B)	1,500	90,000	–	–	–	–	–	–	–	–	–	–	–	–
MERCURY	7439-97-6	0.13 (B, Z)	1.7 (Z)	20000 (Z)	160 (Z)	1.7 (Z)	8800 (Z)	580 (Z)	<0.018 UJ	–	0.092	–	0.79	[2]	0.6	[2]	0.93	[2]	0.075	–
MOLYBDENUM	7439-98-7	2.4 (X)	1.5	ID	2,600	1.5	ID	9,600	–	–	–	–	–	–	–	–	–	–	–	–
NICKEL	7440-02-0	29 (G)	100	13,000	40,000	100	16,000	150,000	–	–	–	–	–	–	–	–	–	–	–	–
SELENIUM	7782-49-2	0.41 (B)	4.0	130,000	2,600	4.0	59,000	9,600	0.98	[2]	1.4	[2]	13	[2,4,11]	0.78	[2]	2.9	[2]	16	[2,4,11]
SILVER	7440-22-4	1.0 (M); 0.027	4.5	6,700	2,500	13	2,900	9,000	<0.43 U	–	<0.45 U	–	11	[2,4]	1.3	[2]	6.3	[2,4]	1.2	[2]
VANADIUM	7440-62-2	430	72	ID	750 (DD)	990	ID	5,500 (DD)	–	–	–	–	–	–	–	–	–	–	–	–
ZINC	7440-66-6	62 (G)	2,400	ID	170,000	5,000	ID	630,000	–	–	–	–	–	–	–	–	–	–	–	–
Inorganics - Cyanide (mg/kg)																				
AVAILABLE CYANIDE	57-12-5	0.1 (P,R)	4.0 (P,R)	250 (P,R)	12 (P,R)	4.0 (P,R)	250 (P,R)	250 (P,R)	<110 U	–	<120 U	–	<110 U	–	<100 U	–	<110 U	–	<120 U	–
Organics - PCBs (ug/kg)																				
TOTAL PCBS	TPCB	NLL	NLL	5,200,000 (J)	1,000 (J,T)	NLL	6,500,000 (J)	1,000 (J,T)	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–
Organics - SVOCs (ug/kg)																				
2-METHYLNAPHTHALENE (SVOC)	91-57-6S	4,200	57,000	8.7E+08	8,100,000	170,000	2.9E+08	2.6E+07	200	–	<7.8 U	–	<7.3 U	–	<10,000 U	–	8,100	[2]	<8.2 U	–
3 & 4-METHYLPHENOL	108-39-4, 106-44-5	NA	NA	NA	NA	NA	NA	NA	<700 U	–	<38 U	–	<36 U	–	<100,000 U	–	6,800	–	<41 U	–
ACENAPHTHENE	83-32-9	8,700	300,000	1.4E+10	4.1E+07	880,000	6.2E+09	1.3E+08	<140 U	–	<7.8 U	–	<7.3 U	–	<10,000 U	–	1,500	–	<8.2 U	–
ACENAPHTHYLENE	208-96-8	ID	5,900	2.3E+09	1,600,000	17,000	1E+09	5,200,000	<140 U	–	<7.8 U	–	<7.3 U	–	<10,000 U	–	31,000	[4,11]	<8.2 U	–
ANTHRACENE	120-12-7	ID	41,000	6.7E+10	2.3E+08	41,000	2.9E+10	7.3E+08	1,100	–	19	–	<7.3 U	–	<10,000 U	–	24,000	–	<8.2 U	–
BENZO(A)ANTHRACENE	56-55-3	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)	3,400	–	24	–	16	–	<10,000 U	–	100,000	[10,17]	32	–
BENZO(A)PYRENE	50-32-8	NLL	NLL	1,500,000 (Q)	2,000 (Q)	NLL	1,900,000 (Q)	8,000 (Q)	3,000	[10]	18	–	<7.3 U	–	<10,000 U	–	100,000	[10,17]	21	–
BENZO(B)FLUORANTHENE	205-99-2	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)	3,100	–	14	–	<7.3 U	–	<10,000 U	–	150,000	[10,17]	26	–

TABLE 5-2
Sample Analytical Summary - Abandoned Container, Residual Process Material, and Waste
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY STAMP MILLS AREA											
Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	QMCM-DM02		QMCM-DM03		QMCM-RPM01		QMCM-RPM04		QMCM-RPM05		QMCM-RPM06	
Field Sample ID									QMCM - DM02-0"-6"		QMCM - DM03-0"-6"		QMCM - RPM01-0"-6"		QMCM - RPM04-0"-6"		QMCM - RPM05-0"-6"		QMCM - RPM06-0"-6"	
Sample Date									05/17/17		05/17/17		05/19/17		05/16/17		05/16/17		05/16/17	
Sample Interval (bgs)									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									Medium to coarse grained granular substance, appears sand-like		White and beige semi-hardened material in gravel sized chunks, cohesive with applied pressure		Grey fine-grained sand material with finer silt. Likely tailings.		Black tar-like and greasy substance, contains fibrous material, hardened on top where exposed to air, softer underneath		Yellow/orange cake-like material in small pieces, found on concrete foundation floor, mixed with soil, gravel, wood debris		Brown silty sand with some clay, cohesive, wet	
									Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Organics - SVOCs (ug/kg) (continued)																				
BENZO(G,H,I)PERYLENE	191-24-2	NLL	NLL	8E+08 (Q)	2,500,000 (Q)	NLL	3.5E+08 (Q)	7,000,000 (Q)	**1,600**	–	<7.8 U	–	<7.3 U	–	<10,000 U	–	**63,000**	–	**11**	–
BENZO(K)FLUORANTHENE	207-08-9	NLL	NLL	ID	200,000 (Q)	NLL	ID	800,000 (Q)	**1,000**	–	<7.8 U	–	<7.3 U	–	<10,000 U	–	**50,000**	–	**9**	–
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	NLL	NLL	7E+08	2,800,000	NLL	8.9E+08	1.2E+07 (C)	<700 U	–	<38 U	–	<36 U	–	<100,000 U	–	<2900 U	–	<41 U	–
CARBAZOLE	86-74-8	1,100	9,400	6.2E+07	530,000	39,000	7.8E+07	2,400,000	<700 U	–	<38 U	–	<36 U	–	<100,000 U	–	**33,000**	[2,4]	<41 U	–
CHRYSENE	218-01-9	NLL	NLL	ID	2,000,000 (Q)	NLL	ID	8,000,000 (Q)	**3,200**	–	<7.8 U	–	<7.3 U	–	<10,000 U	–	**120,000**	–	<8.2 U	–
DIBENZO(A,H)ANTHRACENE	53-70-3	NLL	NLL	ID	2,000 (Q)	NLL	ID	8,000 (Q)	**460**	–	<7.8 U	–	<7.3 U	–	<10,000 U	–	**18,000**	[10,17]	<8.2 U	–
DIBENZOFURAN	132-64-9	1,700	ID	6,700,000	ID	ID	2,900,000	ID	<700 U	–	<38 U	–	<36 U	–	<100,000 U	–	**16,000**	[2]	<41 U	–
FLUORANTHENE	206-44-0	5,500	730,000	9.3E+09	4.6E+07	730,000	4.1E+09	1.3E+08	**5,700**	[2]	**28**	–	**14**	–	<10,000 U	–	**270,000**	[2]	**39**	–
FLUORENE	86-73-7	5,300	390,000	9.3E+09	2.7E+07	890,000	4.1E+09	8.7E+07	**180**	–	<7.8 U	–	<7.3 U	–	<10,000 U	–	**7,400**	[2]	<8.2 U	–
INDENO(1,2,3-CD)PYRENE	193-39-5	NLL	NLL	ID	20,000	NLL	ID	80,000	**1,700**	–	**9.3**	–	<7.3 U	–	<100,000 U	–	**78,000**	[10]	**17**	–
NAPHTHALENE (SVOC)	91-20-3S	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	<140 U	–	<7.8 U	–	<7.3 U	–	<10,000 U	–	**24,000**	[2]	<8.2 U	–
PHENANTHRENE	85-01-8	2,100	56,000	6,700,000	1,600,000	160,000	2,900,000	5,200,000	**5,000**	[2]	<7.8 U	–	<7.3 U	–	<10,000 U	–	**230,000**	[2,4,6,7,8,11,13,14,15]	<8.2 U	–
PYRENE	129-00-0	ID	480,000	6.7E+09	2.9E+07	480,000	2.9E+09	8.4E+07	**8,800**	–	**24**	–	<7.3 U	–	<10,000 U	–	**210,000**	–	**28**	–
Organics - VOCs (ug/kg)																				
1,2,4-TRIMETHYLBENZENE	95-63-6	570 (I)	2,100 (I)	8.2E+10 (I)	3.2E+07 (C,I)	2,100 (I)	3.6E+10 (I)	1E+08 (C,I)	**190**	–	<41 U	–	<40 U	–	<46 U	–	<640 U	–	<45 U	–
2-METHYLNAPHTHALENE (VOC)	91-57-6V	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07	**420**	–	<140 U	–	<130 U	–	<150 UJ	–	<2,100 UJ	–	<150 U	–
BENZENE	71-43-2	240 (I,X)	100 (I)	3.8E+08 (I)	180,000 (I)	100 (I)	4.7E+08 (I)	840,000 (C,I)	**79**	–	<41 U	–	<40 U	–	<46 U	–	<640 U	–	<45 U	–
CHLOROMETHANE	74-87-3	ID	5,200	4.90E+09	1.6E+6 (C)	22,000	2.60E+09	7.4E+6 (C)	<220 U	–	<140 U	–	<130 U	–	**250**	–	<2,100 U	–	<150 U	–
ETHYLBENZENE	100-41-4	360 (I)	1,500 (I)	1E+10 (I)	2.2E+07 (C,I)	1,500 (I)	1.3E+10 (I)	7.1E+07 (C, I)	<67 UJ	–	<41 U	–	<40 U	–	<46 U	–	<640 U	–	<45 U	–
M,P-XYLENE	1330-20-7	NA	NA	NA	NA	NA	NA	NA	**680**	–	<120 U	–	<120 U	–	<140 U	–	<1900 U	–	<140 U	–
NAPHTHALENE (VOC)	91-20-3V	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	**420**	–	<140 U	–	<130 U	–	<150 U	–	**2,800**	[2]	<150 U	–
O-XYLENE	95-47-6	NA	NA	NA	NA	NA	NA	NA	**270**	–	<41 U	–	<40 U	–	<46 U	–	<640 U	–	<45 U	–
TOLUENE	108-88-3	5,400 (I)	16,000 (I)	2.7E+10 (I)	5E+07 (C,I)	16,000 (I)	1.2E+10 (I)	1.6E+08 (C,I)	**410**	–	<41 U	–	<40 U	–	<46 U	–	<640 U	–	<45 U	–
XYLENE - TOTAL	1330-20-7	820 (I)	5,600 (I)	2.9E+11 (I)	4.1E+08 (C,I)	5600 (I)	1.3E+11 (I)	1E+09 (I)	**950**	[2]	<0 U	–	<0 U	–	<0 U	–	<0 U	–	<0 U	–
Organics - Pesticides (ug/kg)																				
									ND	–	ND	–	ND	–	ND	–	ND	–	ND	–
Organics - Herbicides (ug/kg)																				
2,4-D	94-75-7	4,400	1,400	6.70E+09	2.50E+06	1,400	2.90E+09	8.60E+06	**60**	–	<7.6 U	–	<11 U	–	<31 U	–	<110 U	–	<8.2 U	–

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

TABLE 5-2
Sample Analytical Summary - Abandoned Container, Residual Process Material, and Waste
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY RECLAMATION PLANT AREA									
Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	QMCM-RPM02		QMCM-RPM03		QMCM-RPM07		W-01 (MDEQ 2013)		W-02 (MDEQ 2013)	
Field Sample ID									QMCM - RPM02-0"-6"		QMCM - RPM03-0"-6"		QMCM - RPM07-0"-6"		W-01		W-02	
Sample Date									05/17/17		05/17/17		05/17/17		09/10/13		09/10/13	
Sample Interval (bgs)									0 - 0.5 ft		0 - 0.5 ft		0 - 0.5 ft		0 - 2 in		0 - 6 in	
Sample Description									Brown, medium grained sandy material, with gravel pieces		Black, brown crusted material, viscid underneath crust		Brown and gray fine-grained sand, with hardened appearance on 'top'		Moist, dark greenish gray, silt with some green metallic scale.		Moist, brown to black, silty, fine sand with a tarry matrix. Tar smell	
									Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Inorganics - Metals (mg/kg)																		
ANTIMONY	7440-36-0	1.2 (X)	4.3	13,000	180	4.3	5,900	670	–	–	–	–	–	–	64 J	[2,4,11]	3.4	[2]
ARSENIC	7440-38-2	4.6	4.6	720	7.6	4.6	910	37	5	[2,4,11]	<4.1 UJ	–	5	[2,4,11]	16	[2,4,10,11]	2.1	–
BARIUM	7440-39-3	130	1,300 (G)	330,000	37,000	1,300	150,000	130,000	240	[2]	130	–	11	–	110	–	31	–
BERYLLIUM	7440-41-7	4.6 (G)	51	1,300	410	51	590	1,600	–	–	–	–	–	–	<2 U	–	0.4	–
CADMIUM	7440-43-9	1.6 (G,X)	6.0	1,700	550	6.0	2,200	2,100	1.4	–	<8.3 UJ	–	<8.1 UJ	–	<2 U	–	<0.2 U	–
CHROMIUM	7440-47-3	1,200,000 (G,H,X)	1,000,000 (D,H)	330,000 (H)	790,000 (H)	1,000,000 (D,H)	150,000 (H)	1,000,000 (D,H)	31	–	52	–	25	–	35	–	22	–
COBALT	7440-48-4	2.0	0.8	13,000	2,600	2.0	5,900	9,000	–	–	–	–	–	–	16	[2,4,11]	16	[2,4,11]
COPPER	7440-50-8	32 (G)	5,800	130,000	20,000	5,800	59,000	73,000	–	–	–	–	–	–	270,000	[2,4,9,10,11,16,17]	7,000	[2,4,11]
IRON	7439-89-6	NA	12,000 (B)	ID	160,000	12,000 (B)	ID	580,000	–	–	–	–	–	–	46,000	[4,11]	36,000	[4,11]
LEAD	7439-92-1	1,900 (G,X)	700	100,000	400	700	44,000	900 (DD)	1,100	[4,10,11,17]	440	[10]	260	–	370 J	–	760	[4,10,11]
MANGANESE	7439-96-5	440 (B,G,X)	440 (B)	3,300	25,000	440 (B)	1,500	90,000	–	–	–	–	–	–	560	[2,4,11]	470	[2,4,11]
MERCURY	7439-97-6	0.13 (B, Z)	1.7 (Z)	20000 (Z)	160 (Z)	1.7 (Z)	8800 (Z)	580 (Z)	1.3	[2]	0.7	[2]	0.48	[2]	10	[2,4,11]	0.3	[2]
MOLYBDENUM	7439-98-7	24 (X)	1.5	ID	2,600	1.5	ID	9,600	–	–	–	–	–	–	<10,000 U	–	2,400	[4]
NICKEL	7440-02-0	29 (G)	100	13,000	40,000	100	16,000	150,000	–	–	–	–	–	–	46	[2]	30	[2]
SELENIUM	7782-49-2	0.41 (B)	4.0	130,000	2,600	4.0	59,000	9,600	2.9	[2]	2.8	[2]	2.5	[2]	21	[2,4,11]	0.3	–
SILVER	7440-22-4	1.0 (M); 0.027	4.5	6,700	2,500	13	2,900	9,000	9.5	[2,4]	24	[2,4,11]	4	[2]	260 J	[2,4,11]	2.5	[2]
VANADIUM	7440-62-2	430	72	ID	750 (DD)	990	ID	5,500 (DD)	–	–	–	–	–	–	78	[4]	75	[4]
ZINC	7440-66-6	62 (G)	2,400	ID	170,000	5,000	ID	630,000	–	–	–	–	–	–	300	[2]	53	–
Inorganics - Cyanide (mg/kg)																		
AVAILABLE CYANIDE	57-12-5	0.1 (P,R)	4.0 (P,R)	250 (P,R)	12 (P,R)	4.0 (P,R)	250 (P,R)	250 (P,R)	<110 U	–	<110 U	–	<110 U	–	–	–	–	–
Organics - PCBs (ug/kg)																		
TOTAL PCBS	TPCB	NLL	NLL	5,200,000 (J)	1,000 (J,T)	NLL	6,500,000 (J)	1,000 (J,T)	ND	–	ND	–	ND	–	–	–	–	–
Organics - SVOCs (ug/kg)																		
2-METHYLNAPHTHALENE (SVOC)	91-57-6S	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07	<140 U	–	<11,000 U	–	<550 U	–	<610 U	–	<330,000 U	–
3 & 4-METHYLPHENOL	108-39-4, 106-44-5	NA	NA	NA	NA	NA	NA	NA	<710 U	–	<110,000 U	–	<2,700 U	–	<1600 U	–	–	–
ACENAPHTHENE	83-32-9	8,700	300,000	1.4E+10	4.1E+07	880,000	6.2E+09	1.3E+08	<140 U	–	<11,000 U	–	<550 U	–	<240 U	–	<130,000 U	–
ACENAPHTHYLENE	208-96-8	ID	5,900	2.3E+09	1,600,000	17,000	1E+09	5,200,000	<140 U	–	<11,000 U	–	<550 U	–	<240 U	–	<130,000 U	–
ANTHRACENE	120-12-7	ID	41,000	6.7E+10	2.3E+08	41,000	2.9E+10	7.3E+08	<140 U	–	<11,000 U	–	<550 U	–	<240 U	–	<130,000 U	–
BENZO(A)ANTHRACENE	56-55-3	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)	1,000	–	<11,000 U	–	<550 U	–	<240 U	–	<130,000 U	–
BENZO(A)PYRENE	50-32-8	NLL	NLL	1,500,000 (Q)	2,000 (Q)	NLL	1,900,000 (Q)	8,000 (Q)	880	–	<11,000 U	–	<550 U	–	<490 U	–	<260,000 U	–
BENZO(B)FLUORANTHENE	205-99-2	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)	1,400	–	<11,000 U	–	<550 U	–	<490 U	–	<260,000 U	–

TABLE 5-2
Sample Analytical Summary - Abandoned Container, Residual Process Material, and Waste
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY RECLAMATION PLANT AREA									
Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	QMCM-RPM02		QMCM-RPM03		QMCM-RPM07		W-01 (MDEQ 2013)		W-02 (MDEQ 2013)	
Field Sample ID									QMCM - RPM02-0"-6"		QMCM - RPM03-0"-6"		QMCM - RPM07-0"-6"		W-01		W-02	
Sample Date									05/17/17		05/17/17		05/17/17		09/10/13		09/10/13	
Sample Interval (bgs)									0 - 0.5 ft		0 - 0.5 ft		0 - 0.5 ft		0 - 2 in		0 - 6 in	
Sample Description									Brown, medium grained sandy material, with gravel pieces		Black, brown crusted material, viscid underneath crust		Brown and gray fine-grained sand, with hardened appearance on 'top'		Moist, dark greenish gray, silt with some green metallic scale.		Moist, brown to black, silty, fine sand with a tarry matrix. Tar smell	
									Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Organics - SVOCs (ug/kg) (continued)																		
BENZO(G,H,I)PERYLENE	191-24-2	NLL	NLL	8E+08 (Q)	2,500,000 (Q)	NLL	3.5E+08 (Q)	7,000,000 (Q)	**720**	–	<11,000 U	–	<550 U	–	<490 UJ	–	<260,000 UJ	–
BENZO(K)FLUORANTHENE	207-08-9	NLL	NLL	ID	200,000 (Q)	NLL	ID	800,000 (Q)	**430**	–	<11,000 U	–	<550 U	–	<490 U	–	<260,000 U	–
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	NLL	NLL	7E+08	2,800,000	NLL	8.9E+08	1.2E+07 (C)	<710 U	–	<110,000 U	–	<2,700 U	–	**1,100**	–	–	–
CARBAZOLE	86-74-8	1,100	9,400	6.2E+07	530,000	39,000	7.8E+07	2,400,000	<710 U	–	<110,000 U	–	<2,700 U	–	<610 U	–	–	–
CHRYSENE	218-01-9	NLL	NLL	ID	2,000,000 (Q)	NLL	ID	8,000,000 (Q)	**520**	–	<11,000 U	–	<550 U	–	<240 U	–	<130,000 U	–
DIBENZO(A,H)ANTHRACENE	53-70-3	NLL	NLL	ID	2,000 (Q)	NLL	ID	8,000 (Q)	**240**	–	<11,000 U	–	<550 U	–	<490 U	–	<260,000 U	–
DIBENZOFURAN	132-64-9	1,700	ID	6,700,000	ID	ID	2,900,000	ID	<710 U	–	<110,000 U	–	<2,700 U	–	<610 U	–	–	–
FLUORANTHENE	206-44-0	5,500	730,000	9.3E+09	4.6E+07	730,000	4.1E+09	1.3E+08	**1,500**	–	<11,000 U	–	<550 U	–	**260**	–	<130,000 U	–
FLUORENE	86-73-7	5,300	390,000	9.3E+09	2.7E+07	890,000	4.1E+09	8.7E+07	<140 U	–	<11,000 U	–	<550 U	–	<240 U	–	<130,000 U	–
INDENO(1,2,3-CD)PYRENE	193-39-5	NLL	NLL	ID	20,000	NLL	ID	80,000	**760**	–	<110,000 U	–	<550 U	–	<490 U	–	<260,000 U	–
NAPHTHALENE (SVOC)	91-20-3S	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	<140 U	–	<11,000 U	–	<550 U	–	<240 U	–	<130,000 U	–
PHENANTHRENE	85-01-8	2,100	56,000	6,700,000	1,600,000	160,000	2,900,000	5,200,000	<140 U	–	<11,000 U	–	<550 U	–	**300**	–	<130,000 U	–
PYRENE	129-00-0	ID	480,000	6.7E+09	2.9E+07	480,000	2.9E+09	8.4E+07	**1,300**	–	<11,000 U	–	<550 U	–	**290**	–	<130,000 U	–
Organics - VOCs (ug/kg)																		
1,2,4-TRIMETHYLBENZENE	95-63-6	570 (I)	2,100 (I)	8.2E+10 (I)	3.2E+07 (C,I)	2,100 (I)	3.6E+10 (I)	1E+08 (C,I)	**82**	–	**120**	–	<41 U	–	–	–	–	–
2-METHYLNAPHTHALENE (VOC)	91-57-6V	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07	<160 UJ	–	<160 UJ	–	<140 U	–	–	–	–	–
BENZENE	71-43-2	240 (I,X)	100 (I)	3.8E+08 (I)	180,000 (I)	100 (I)	4.7E+08 (I)	840,000 (C,I)	<47 U	–	<47 U	–	<41 U	–	–	–	–	–
CHLOROMETHANE	74-87-3	ID	5,200	4.90E+09	1.6E+6 (C)	22,000	2.60E+09	7.4E+6 (C)	<160 U	–	<160 U	–	<140 U	–	–	–	–	–
ETHYLBENZENE	100-41-4	360 (I)	1,500 (I)	1E+10 (I)	2.2E+07 (C,I)	1,500 (I)	1.3E+10 (I)	7.1E+07 (C, I)	<47 UJ	–	**94**	–	<41 U	–	–	–	–	–
M,P-XYLENE	1330-20-7	NA	NA	NA	NA	NA	NA	NA	**300**	–	**510**	–	<120 U	–	–	–	–	–
NAPHTHALENE (VOC)	91-20-3V	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	**170**	–	<160 UJ	–	<140 UJ	–	–	–	–	–
O-XYLENE	95-47-6	NA	NA	NA	NA	NA	NA	NA	**120**	–	**140**	–	<41 U	–	–	–	–	–
TOLUENE	108-88-3	5,400 (I)	16,000 (I)	2.7E+10 (I)	5E+07 (C,I)	16,000 (I)	1.2E+10 (I)	1.6E+08 (C,I)	**180**	–	**390**	–	<41 U	–	–	–	–	–
XYLENE - TOTAL	1330-20-7	820 (I)	5,600 (I)	2.9E+11 (I)	4.1E+08 (C,I)	5600 (I)	1.3E+11 (I)	1E+09 (I)	**420**	–	**650**	–	<0 U	–	–	–	–	–
Organics - Pesticides (ug/kg)																		
									ND	–	ND	–	ND	–	–	–	–	–
Organics - Herbicides (ug/kg)																		
2,4-D	94-75-7	4,400	1,400	6.70E+09	2.50E+06	1,400	2.90E+09	8.60E+06	<8.7 U	–	<22 U	–	<8.1 U	–	–	–	–	–

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

TABLE 5-2
Sample Analytical Summary - Abandoned Container, Residual Process Material, and Waste
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Abandoned Container, Residual Process Material, and Waste Table Footnotes:

- MDEQ 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.
- 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. ND indicates that one or more analyte of that group was tested and not detected and a -- indicates not analyzed.
- **Bold** values are concentrations detected above the laboratory reporting limit.
- **Bold/Shaded** cells indicate analyte concentration exceeded applicable criteria. MDEQ 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
[3]* - Soil Saturation Concentration Screening Levels
[4] - Residential Drinking Water Protection Criteria
[5]* - Residential Soil Volatilization to Indoor Air Inhalation Criteria (VSIC)
[6]** - Residential Infinite Source Volatile Soil Inhalation Criteria
[7]** - Residential Finite VSIC for 5 Meter Source Thickness
[8]** - Residential Finite VSIC for 2 Meter Source Thickness
[9] - Residential Particulate Soil Inhalation Criteria
[10]- Residential Direct Contact Criteria
[11] - Nonresidential Drinking Water Protection Criteria
[12]* - Nonresidential Soil Volatilization to Indoor Air Inhalation
[13]** - Nonresidential Infinite Source Volatile Soil Inhalation Criteria
[14]** - Nonresidential Finite VSIC for 5 Meter Source Thickness
[15]** - Nonresidential Finite VSIC for 2 Meter Source Thickness
[16] - Nonresidential Particulate Soil Inhalation Criteria
[17] - Nonresidential Direct Contact Criteria

* = Individual criteria for this group are not presented in this table because none were exceeded.
** = Individual criteria for this group are not presented due to limited exceedances. Phenanthrene in sample QMCM-RPM05 exceeded [6], [7], [8] which are 160,000 ug/kg and [13], [14], and [15] which are 190,000 ug/kg.
Evaluation based on MDEQ 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.

-- = Not analyzed/Not Reported
bgs = Below ground surface
ft = Feet
in = Inches
mg/kg = Milligrams per kilogram
PCBs = Polychlorinated biphenyls
VOC = Volatile organic compounds
SVOC = Semi-volatile organic compound
ug/kg = Micrograms per kilogram
% = Percentage

Criteria Footnote:

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.
(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.
(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 CaCO3/L, use 400 mg CaCO3/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 Environmental Quality (DEQ) internet web site. A hardness value of 47.5 CaCO3/L and pH of 7, derived from the MDEQ 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 DEQ, 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 DEQ, 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 DEQ, 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 DEQ, 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 DEQ, 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 DEQ, 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.

Laboratory Footnote:

J = The result is an estimated quantity
ND = Not Detected
U = Analyte analyzed for but not detected above the reported sample reporting limit.

TABLE 5-3
Sample Analytical Summary - Waste Characterization
Quincy Mining Company Mason Operation Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location			QUINCY STAMP MILLS AREA												QUINCY RECLAMATION PLANT AREA					
Station Name	Units	[18] Hazardous Waste Toxicity Value	QMCM-DM02		QMCM-DM03		QMCM-RPM01		QMCM-RPM04		QMCM-RPM05		QMCM-RPM06		QMCM-RPM02		QMCM-RPM03		QMCM-RPM07	
Sample ID			QMCM - DM02-0"-6" (TCLP)		QMCM - DM03-0"-6" (TCLP)		QMCM - RPM01-0"-6" (TCLP)		QMCM - RPM04-0"-6" (TCLP)		QMCM - RPM05-0"-6" (TCLP)		QMCM - RPM06-0"-6" (TCLP)		QMCM - RPM02-0"-6" (TCLP)		QMCM - RPM03-0"-6" (TCLP)		QMCM - RPM07-0"-6" (TCLP)	
Sample Date			05/17/17		05/16/17		05/17/17		05/16/17		05/17/17		05/17/17		05/17/17		05/16/17		05/17/17	
Sample Interval (bgs)			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		0 - 0.5 ft	
Sample Description			Medium to coarse grained granular substance, appears sand-like		White and beige semi-hardened material in gravel sized chunks, cohesive with applied pressure		Grey fine-grained sand material with finer silt. Likely tailings.		Black tar-like and greasy substance, contains fibrous material, hardened on top where exposed to air, softer underneath		Yellow/orange cake-like material in small pieces, found on concrete foundation floor, mixed with soil, gravel, wood debris		Brown silty sand with some clay, cohesive, wet		Brown, medium grained sandy material, with gravel pieces		Black, brown crusted material, viscid underneath crust		Brown and gray fine-grained sand, with hardened appearance on 'top'	
			Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Inorganics - TCLP Metals																				
ARSENIC	mg/l	5	<0.5 U	–	<0.5 U	–	<0.5 U	–	<0.5 U	–	<0.5 U	–	<0.5 U	–	<0.5 U	–	<0.5 U	–	<0.5 U	–
BARIUM	mg/l	100	<0.5 UJ	–	<0.5 UJ	–	<0.5 UJ	–	<0.5 UJ	–	**3.4**	–	<0.5 UJ	–	**1.6**	–	<0.5 UJ	–	<0.5 UJ	–
CADMIUM	mg/l	1	<1.0 UJ	–	<1.0 UJ	–	<1.0 UJ	–	<1.0 U	–	<1.0 U	–	<1.0 UJ	–	<1.0 UJ	–	<1.0 UJ	–	<1.0 UJ	–
CHROMIUM	mg/l	5	<0.5 U	–	<0.5 U	–	<0.5 U	–	<0.5 U	–	<0.5 U	–	<0.5 UJ	–	<0.5 U	–	<0.5 U	–	<0.5 U	–
LEAD	mg/l	5	<0.5 U	–	<0.5 UJ	–	<0.5 U	–	**1.1**	–	**15**	[18]	<0.5 U	–	**4.9**	–	**0.53**	–	**0.65**	–
MERCURY	mg/l	0.2	<0.002 U	–	<0.002 U	–	<0.002 U	–	<0.002 U	–	<0.002 U	–	<0.002 U	–	<0.002 U	–	<0.002 U	–	<0.002 U	–
SELENIUM	mg/l	1	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–
SILVER	mg/l	5	<0.5 U	–	<0.5 U	–	<0.5 U	–	<0.5 U	–	<0.5 U	–	<0.5 U	–	<0.5 U	–	<0.5 U	–	<0.5 U	–
Organics - TCLP SVOCs																				
HEXACHLOROETHANE (SVOC)	ug/l	3,000	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–
m-Cresol	ug/l	200,000	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–
o-Cresol	ug/l	200,000	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–
p-Cresol	ug/l	200,000	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–
2,4,5-TRICHLOROPHENOL	ug/l	400,000	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–
2,4,6-TRICHLOROPHENOL	ug/l	2,000	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–
2,4-DINITROTOLUENE	ug/l	130	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–
HEXACHLORO-1,3-BUTADIENE	ug/l	500	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–
HEXACHLOROBENZENE	ug/l	130	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–
NITROBENZENE	ug/l	2,000	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–
PENTACHLOROPHENOL	ug/l	100,000	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–
PYRIDINE	ug/l	5,000	<200 U	–	<200 U	–	<200 U	–	<200 U	–	<200 U	–	<200 U	–	<200 U	–	<200 U	–	<200 U	–
Organics - TCLP VOCs																				
1,1-DICHLOROETHYLENE	ug/l	700	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–
1,2-DICHLOROETHANE	ug/l	500	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–
1,4-DICHLOROBENZENE	ug/l	7,500	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–
2-BUTANONE (MEK)	ug/l	200,000	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–	<100 U	–
BENZENE	ug/l	500	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 UJ	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–
CARBON TETRACHLORIDE	ug/l	500	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–
CHLOROBENZENE	ug/l	100,000	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–
CHLOROFORM	ug/l	6,000	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–
TETRACHLOROETHYLENE	ug/l	700	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–
TRICHLOROETHYLENE	ug/l	500	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–
VINYL CHLORIDE	ug/l	200	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–

TABLE 5-3
Sample Analytical Summary - Waste Characterization
Quincy Mining Company Mason Operation Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location			QUINCY STAMP MILLS AREA												QUINCY RECLAMATION PLANT AREA					
Station Name	Units	[18] Hazardous Waste Toxicity Value	QMCM-DM02		QMCM-DM03		QMCM-RPM01		QMCM-RPM04		QMCM-RPM05		QMCM-RPM06		QMCM-RPM02		QMCM-RPM03		QMCM-RPM07	
Sample ID			QMCM - DM02-0"-6" (TCLP)		QMCM - DM03-0"-6" (TCLP)		QMCM - RPM01-0"-6" (TCLP)		QMCM - RPM04-0"-6" (TCLP)		QMCM - RPM05-0"-6" (TCLP)		QMCM - RPM06-0"-6" (TCLP)		QMCM - RPM02-0"-6" (TCLP)		QMCM - RPM03-0"-6" (TCLP)		QMCM - RPM07-0"-6" (TCLP)	
Sample Date			05/17/17		05/16/17		05/17/17		05/16/17		05/17/17		05/17/17		05/17/17		05/16/17		05/17/17	
Sample Interval (bgs)			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		0 - 0.5 ft	
Sample Description			Medium to coarse grained granular substance, appears sand-like		White and beige semi-hardened material in gravel sized chunks, cohesive with applied pressure		Grey fine-grained sand material with finer silt. Likely tailings.		Black tar-like and greasy substance, contains fibrous material, hardened on top where exposed to air, softer underneath		Yellow/orange cake-like material in small pieces, found on concrete foundation floor, mixed with soil, gravel, wood debris		Brown silty sand with some clay, cohesive, wet		Brown, medium grained sandy material, with gravel pieces		Black, brown crusted material, viscid underneath crust		Brown and gray fine-grained sand, with hardened appearance on 'top'	
			Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Organics - TCLP Pesticides																				
Chlordane, Technical	ug/l	30	<0.5 U	--	<0.5 U	--	<0.5 U	--	<0.5 U	--	<0.5 U	--	<0.5 U	--	<0.5 U	--	<0.5 U	--	<0.5 U	--
Endrin	ug/l	20	<0.02 U	--	<0.02 U	--	<0.02 U	--	**0.12**	--	<0.02 U	--	<0.02 U	--	<0.02 U	--	<0.02 U	--	<0.02 U	--
gamma-BHC (Lindane)	ug/l	400	<0.01 U	--	<0.01 U	--	<0.01 U	--	<0.01 U	--	<0.01 U	--	<0.01 U	--	<0.01 U	--	<0.01 U	--	<0.01 U	--
Heptachlor	ug/l	8	<0.01 U	--	<0.01 U	--	**0.012**	--	<0.01 U	--	<0.01 U	--	<0.01 U	--	<0.01 U	--	<0.01 U	--	<0.01 U	--
Heptachlor epoxide	ug/l	8	<0.01 U	--	<0.01 U	--	<0.01 U	--	<0.01 U	--	<0.01 U	--	<0.01 U	--	<0.01 U	--	<0.01 U	--	<0.01 U	--
Methoxychlor	ug/l	10,000	<0.04 U	--	<0.04 U	--	<0.04 U	--	<0.04 U	--	<0.04 U	--	<0.04 U	--	<0.04 U	--	<0.04 U	--	<0.04 U	--
Toxaphene	ug/l	500	<2.0 U	--	<2.0 U	--	<2.0 U	--	<2.0 U	--	<2.0 U	--	<2.0 U	--	<2.0 U	--	<2.0 U	--	<2.0 U	--
Organics - TCLP Herbicides																				
2,4,5-TP (Silvex)	ug/l	1,000	<5.0 U	--	<5.0 U	--	<5.0 U	--	<5.0 U	--	<5.0 U	--	<5.0 U	--	<5.0 U	--	<5.0 U	--	<5.0 U	--
2,4-D	ug/l	10,000	<5.0 U	--	**7.4**	--	<5.0 U	--	<5.0 UJ	--	<5.0 U	--	<5.0 UJ	--	<5.0 U	--	<5.0 U	--	**7.4**	--
Other - General Chemistry																				
PERCENT MOISTURE	%	--	**8.4**	--	**16**	--	**9.4**	--	**2.7**	--	**13**	--	**20**	--	**11**	--	**6.1**	--	**4.8**	--
pH	s.u.	--	**6.25**	--	**7.1**	--	**7.81**	--	**5.56**	--	**6.55**	--	**8.04**	--	**7.51**	--	**8.2**	--	**6.45**	--
Flashpoint/Ignitability	Deg F	--	<1 U	--	<1 U	--	<1 U	--	<1 U	--	<1 U	--	<1 U	--	<1 U	--	<1 U	--	<1 U	--
Free Liquids	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hardness (Calculation)	mg/l	--	--	--	--	--	**170,000**	--	**13,000**	--	**30,000**	--	**210,000**	--	--	--	**110,000**	--	--	--
Unionized Hydrogen Sulfide	mg/kg	--	<110 U	--	<120 U	--	<110 U	--	<100 U	--	<110 U	--	<120 U	--	<110 U	--	<110 U	--	<110 U	--

Note: Hazardous Waste Toxicitiy Screening values are from Title 40 of the Code of Federal Regulation, Chapter 1, Section 261.20-24

- **Bold** values are concentrations detected above the laboratory reporting limit.
- **Bold/Shaded** cells indicate analyte concentration exceeds the hazardous waste toxicity value.

Evaluation based on MDEQ 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.

TCLP = Toxicity Charateristic Leaching Procedure
ft = Feet
-- = No value listed
mg/l = Milligram per liter
ug/l = Micrograms per liter
mg/kg = Milligram per kilogram
% = Percentage
F = Degrees Fahrenheit
SU = Standard unit
J = The result is an estimated quantity
U = Analyte analyzed for but not detected above reported sample reporting limit
SVOCs = Semi-volatile organic compounds
VOCs = Volatile organic compounds

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY STAMP MILLS AREA																	
Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	MasonB-6		QMCM-SB01								QMCM-SB02				QMCM-SB03			
Field Sample ID									Mason XRF6		QMCM-SB01 0-6"		QMCM-SB01 0-6" DUP		QMCM-SB01 6"-8'		QMCM-SB01 6"-8" DUP		QMCM-SB02 4"-10"		QMCM-SB02 10"-4'		QMCM-SB03 0-6"		QMCM-SB03 6"-5'	
Sample Date									09/06/07		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17	
Sample Interval (bgs)									0 - 0 in		0 - 0.5 ft		0 - 0.5 ft		0.5 - 8 ft		0.5 - 8 ft		0.25 - 0.83 ft		0.83 - 4 ft		0 - 0.5 ft		0.5 - 5 ft	
Sample Description									–		TOPSOIL to 6 in		Field Duplicate		SAND, Medium, gray to 5 ft; SILT SAND, Fine, gray to 8.5 ft		Field Duplicate		GRAVEL, Reddish brown to 1 ft		GRAVEL, Reddish brown to 1 ft; SILT SAND, Fine, gray to 4 ft		TOPSOIL to 6 in, No Cap Present		SAND, Medium, dark gray to 3.5 ft; SAND, Fine to medium, reddish brown to 9 ft, saturated at 5 ft	
									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	6,900 (B)	ID	50,000 (DD)	6,900 (B)	ID	370,000 (DD)	16,000 J	[4,11]	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ANTIMONY	7440-36-0	1.2 (X)	4.3	13,000	180	4.3	5,900	670	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ARSENIC	7440-38-2	4.6	4.6	720	7.6	4.6	910	37	6.7	[2,4,11]	9.3	[2,4,10,11]	8.7	[2,4,10,11]	6.5	[2,4,11]	6.1	[2,4,11]	4.6	–	6.3	[2,4,11]	7.2	[2,4,11]	4.7	[2,4,11]
BARIUM	7440-39-3	130	1,300 (G)	330,000	37,000	1,300	150,000	130,000	–	–	160	[2]	110	–	50	–	72	–	31	–	46	–	48	–	19	–
BERYLLIUM	7440-41-7	4.6 (G)	51	1,300	410	51	590	1,600	0.75 J	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CADMIUM	7440-43-9	1.6 (G,X)	6.0	1,700	550	6.0	2,200	2,100	–	–	2.4	[2]	1.5	–	0.5	–	0.6	–	0.3	–	0.2	–	0.3	–	<0.2 U	–
CALCIUM	7440-70-2	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CHROMIUM	7440-47-3	1,200,000 (G,H,X)	1,000,000 (D,H)	330,000 (H)	790,000 (H)	1,000,000 (D,H)	150,000 (H)	1,000,000 (D,H)	8.2 J	–	93	–	90	–	25	–	20	–	23	–	18	–	11	–	7.2	–
COBALT	7440-48-4	2.0	0.8	13,000	2,600	2.0	5,900	9,000	17	[2,4,11]	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
COPPER	7440-50-8	32 (G)	5,800	130,000	20,000	5,800	59,000	73,000	1,900	[2]	3,200	[2]	2,600	[2]	310	[2]	300	[2]	3,000	[2]	2,000	[2]	1,500	[2]	18	–
IRON	7439-89-6	NA	12,000 (B)	ID	160,000	12,000 (B)	ID	580,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
LEAD	7439-92-1	1,900 (G,X)	700	100,000	400	700	44,000	900 (DD)	1,100	[4,10,11,17]	520	[10]	450	[10]	110	–	220	–	99	–	39	–	790	[4,10,11]	1.6	–
LITHIUM	7439-93-2	9.8 (B)	9.8 (B)	2,300,000	4,200 (DD)	9.8 (B)	1,000,000	31,000 (DD)	7.1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MAGNESIUM	7439-95-4	NA	8,000	6,700,000	1,000,000 (D)	22,000	2,900,000	1,000,000 (D)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MANGANESE	7439-96-5	440 (B,G,X)	440 (B)	3,300	25,000	440 (B)	1,500	90,000	790	[2,4,11]	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MERCURY	7439-97-6	0.13 (B, Z)	1.7 (Z)	20000 (Z)	160 (Z)	1.7 (Z)	8800 (Z)	580 (Z)	0.51	[2]	0.4	[2]	0.3	[2]	0.2	[2]	0.2	[2]	0.1	–	<0.06 U	–	0.1	–	<0.06 U	–
NICKEL	7440-02-0	29 (G)	100	13,000	40,000	100	16,000	150,000	31	[2]	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
POTASSIUM	7440-09-7	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SELENIUM	7782-49-2	0.41 (B)	4.0	130,000	2,600	4.0	59,000	9,600	–	–	<0.2 U	–	<0.2 U	–	<0.2 U	–	<0.2 U	–	<0.2 U	–	<0.2 U	–	0.5	[2]	0.3	–
SILVER	7440-22-4	1.0 (M); 0.027	4.5	6,700	2,500	13	2,900	9,000	5.3	[2,4]	3	[2]	3	[2]	3.5	[2]	3.2	[2]	2.4	[2]	1.3	[2]	2.9	[2]	<0.1 U	–
SODIUM	7440-23-5	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
THALLIUM	7440-28-0	1.4	2.3	13,000	35	2.3	5,900	130	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
VANADIUM	7440-62-2	430	72	ID	750 (DD)	990	ID	5,500 (DD)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ZINC	7440-66-6	62 (G)	2,400	ID	170,000	5,000	ID	630,000	110 J	[2]	1,200	[2]	740	[2]	180	[2]	180	[2]	130	[2]	68	[2]	100	[2]	12	–
Inorganics - Cyanide (mg/kg)																										
CYANIDE	57-12-5	0.1 (P,R)	4.0 (P,R)	250 (P,R)	12 (P,R)	4.0 (P,R)	250 (P,R)	250 (P,R)	–	–	<0.13 U	–	<0.12 U	–	<0.12 U	–	<0.12 U	–	<0.12 U	–	<0.13 U	–	<0.11 U	–	0.11	–
Organics - PCBs (ug/kg)																										
AROCLOR-1260	11096-82-5	NA	NA	NA	NA	NA	NA	NA	<39 U	–	<130 U	–	<160 U	–	<120 U	–	<190 U	–	<120 U	–	<130 U	–	<110 U	–	<160 U	–
AROCLOR-1262	37324-23-5	NA	NA	NA	NA	NA	NA	NA	<39 U	–	<130 U	–	<160 U	–	<120 U	–	<190 U	–	<120 U	–	<130 U	–	<110 U	–	<160 U	–
TOTAL PCBS	TPCB	NLL	NLL	5,200,000 (J)	1,000 (J,T)	NLL	6,500,000 (J)	1,000 (J,T)	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location		[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	QUINCY STAMP MILLS AREA																	
Station Name	CAS Number								MasonB-6		QMCM-SB01								QMCM-SB02				QMCM-SB03			
Field Sample ID									Mason XRF6		QMCM-SB01 0-6"		QMCM-SB01 0-6" DUP		QMCM-SB01 6"-8'		QMCM-SB01 6"-8" DUP		QMCM-SB02 4"-10"		QMCM-SB02 10"-4'		QMCM-SB03 0-6"		QMCM-SB03 6"-5'	
Sample Date									09/06/07		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17	
Sample Interval (bgs)									0 - 0 in		0 - 0.5 ft		0 - 0.5 ft		0.5 - 8 ft		0.5 - 8 ft		0.25 - 0.83 ft		0.83 - 4 ft		0 - 0.5 ft		0.5 - 5 ft	
Sample Description									–		TOPSOIL to 6 in		Field Duplicate		SAND, Medium, gray to 5 ft; SILT SAND, Fine, gray to 8.5 ft		Field Duplicate		GRAVEL, Reddish brown to 1 ft		GRAVEL, Reddish brown to 1 ft; SILT SAND, Fine, gray to 4 ft		TOPSOIL to 6 in, No Cap Present		SAND, Medium, dark gray to 3.5 ft; SAND, Fine to medium, reddish brown to 9 ft, saturated at 5 ft	
									Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Organics – SVOCs (ug/kg)																										
1,1'-BIPHENYL	92-52-4	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2-METHYLNAPHTHALENE (SVOC)	91-57-6S	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07	–	–	<1600 U	–	<620 U	–	<600 U	–	<590 U	–	<580 U	–	**1,000**	–	**630**	–	**1,500**	–
ACENAPHTHENE	83-32-9	8,700	300,000	1.4E+10	4.1E+07	880,000	6.2E+09	1.3E+08	–	–	<630 U	–	<250 U	–	<240 U	–	<240 U	–	<230 U	–	<250 U	–	<220 U	–	<220 U	–
ACENAPHTHYLENE	208-96-8	ID	5,900	2.3E+09	1,600,000	17,000	1E+09	5,200,000	–	–	<630 U	–	<250 U	–	<240 U	–	<240 U	–	<230 U	–	<250 U	–	<220 U	–	<220 U	–
ACETOPHENONE	98-86-2	ID	30,000	3.3E+10	4.7E+07 (C)	88,000	1.4E+10	1.5E+08 (C)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ANTHRACENE	120-12-7	ID	41,000	6.7E+10	2.3E+08	41,000	2.9E+10	7.3E+08	–	–	<630 U	–	<250 U	–	<240 U	–	<240 U	–	<230 U	–	<250 U	–	<220 U	–	<220 U	–
BENZO(A)ANTHRACENE	56-55-3	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)	–	–	**630**	–	**590**	–	<240 U	–	<240 U	–	**410**	–	<250 U	–	<220 U	–	<220 U	–
BENZO(A)PYRENE	50-32-8	NLL	NLL	1,500,000 (Q)	2,000 (Q)	NLL	1,900,000 (Q)	8,000 (Q)	–	–	<1300 U	–	**700**	–	<480 U	–	<470 U	–	**450 J**	–	<500 U	–	<450 U	–	<450 U	–
BENZO(B)FLUORANTHENE	205-99-2	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)	–	–	<1300 U	–	**970**	–	<480 U	–	<470 U	–	**650**	–	<500 U	–	<450 U	–	<450 U	–
BENZO(G,H,I)PERYLENE	191-24-2	NLL	NLL	8E+08 (Q)	2,500,000 (Q)	NLL	3.5E+08 (Q)	7,000,000 (Q)	–	–	<1300 U	–	**500**	–	<480 U	–	<470 U	–	<460 U	–	<500 U	–	<450 U	–	<450 U	–
BENZO(K)FLUORANTHENE	207-08-9	NLL	NLL	ID	200,000 (Q)	NLL	ID	800,000 (Q)	–	–	<1300 U	–	<490 U	–	<480 U	–	<470 U	–	<460 U	–	<500 U	–	<450 U	–	<450 U	–
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	NLL	NLL	7E+08	2,800,000	NLL	8.9E+08	1.2E+07 (C)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CARBAZOLE	86-74-8	1,100	9,400	6.2E+07	530,000	39,000	7.8E+07	2,400,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CHRYSENE	218-01-9	NLL	NLL	ID	2,000,000 (Q)	NLL	ID	8,000,000 (Q)	–	–	<630 U	–	**580**	–	<240 U	–	<240 U	–	**320**	–	<250 U	–	<220 U	–	<220 U	–
DIBENZO(A,H)ANTHRACENE	53-70-3	NLL	NLL	ID	2,000 (Q)	NLL	ID	8,000 (Q)	–	–	<1300 U	–	<490 U	–	<480 U	–	<470 U	–	<460 U	–	<500 U	–	<450 U	–	<450 U	–
DIBENZOFURAN	132-64-9	1,700	ID	6,700,000	ID	ID	2,900,000	ID	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DI-N-BUTYLPHTHALATE	84-74-2	11000	960,000	3.30E+09	2.70E+07	2.7E+6 (C)	1.50E+09	8.7E+7 (C)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
FLUORANTHENE	206-44-0	5,500	730,000	9.3E+09	4.6E+07	730,000	4.1E+09	1.3E+08	–	–	**1,400**	–	**1,400**	–	<240 U	–	<240 U	–	**1,000**	–	**340**	–	<220 U	–	<220 U	–
FLUORENE	86-73-7	5,300	390,000	9.3E+09	2.7E+07	890,000	4.1E+09	8.7E+07	–	–	<630 U	–	<250 U	–	<240 U	–	<240 U	–	<230 U	–	<250 U	–	<220 U	–	<220 U	–
INDENO(1,2,3-CD)PYRENE	193-39-5	NLL	NLL	ID	20,000	NLL	ID	80,000	–	–	<1300 U	–	<490 U	–	<480 U	–	<470 U	–	<460 U	–	<500 U	–	<450 U	–	<450 U	–
NAPHTHALENE (SVOC)	91-20-3S	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	–	–	<630 U	–	<250 U	–	<240 U	–	<240 U	–	**280**	–	**880**	[2]	**490**	–	**1,200**	[2]
PHENANTHRENE	85-01-8	2,100	56,000	6,700,000	1,600,000	160,000	2,900,000	5,200,000	–	–	**700**	–	**900**	–	**290**	–	<240 U	–	**710**	–	**550**	–	**380**	–	**640**	–
PYRENE	129-00-0	ID	480,000	6.7E+09	2.9E+07	480,000	2.9E+09	8.4E+07	–	–	**1,200**	–	**1,100**	–	<240 U	–	<240 U	–	**790**	–	**280**	–	<220 U	–	<220 U	–
Organics - VOCs (ug/kg)																										
1,2,3-TRIMETHYLBENZENE	526-73-8	NA	NA	NA	NA	NA	NA	NA	–	–	<79 U	–	<76 U	–	<75 U	–	<69 U	–	**110**	–	<81 U	–	<63 U	–	**230**	–
1,2,4-TRIMETHYLBENZENE	95-63-6	570 (I)	2,100 (I)	8.2E+10 (I)	3.2E+07 (C,I)	2,100 (I)	3.6E+10 (I)	1E+08 (C,I)	–	–	<79 U	–	<76 U	–	<75 U	–	<69 U	–	**270**	–	<81 U	–	**110**	–	**600**	[2]
1,3,5-TRIMETHYLBENZENE	108-67-8	1,100 (I)	1,800 (I)	8.2E+10 (I)	3.2E+07 (C,I)	1,800 (I)	3.6E+10 (I)	1E+08 (C,I)	–	–	<79 U	–	<76 U	–	<75 U	–	<69 U	–	<66 U	–	<81 U	–	<63 U	–	**110**	–
2-METHYLNAPHTHALENE (VOC)	91-57-6V	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07	–	–	<390 U	–	<380 U	–	<380 U	–	<350 U	–	**720**	–	<410 U	–	**370**	–	**1,000**	–
BENZENE	71-43-2	240 (I,X)	100 (I)	3.8E+08 (I)	180,000 (I)	100 (I)	4.7E+08 (I)	840,000 (C,I)	–	–	<79 U	–	<76 U	–	<75 U	–	<69 U	–	**130**	[4,11]	<81 U	–	<63 U	–	**150**	[4,11]
CYCLOHEXANE	110-82-7	NA	NA	NA	NA	NA	NA	NA	–	–	<390 U	–	<380 U	–	<380 U	–	<350 U	–	<330 U	–	<410 U	–	<320 U	–	**840**	–
ETHYLBENZENE	100-41-4	360 (I)	1,500 (I)	1E+10 (I)	2.2E+07 (C,I)	1,500 (I)	1.3E+10 (I)	7.1E+07 (C, I)	–	–	<79 U	–	<76 U	–	<75 U	–	<69 U	–	**280**	–	<81 U	–	<63 U	–	**210**	–
HEXANE	110-54-3	NA	1.8E+05 (C)	1.30E+10	9.2E+07 (C)	5.1E+5 (C)	5.90E+09	3.0E+8 (C)	–	–	<79 U	–	<76 U	–	<75 U	–	<69 U	–	**100**	–	<81 U	–	<63 U	–	**260**	–

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY STAMP MILLS AREA																	
Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	MasonB-6		QMCM-SB01								QMCM-SB02				QMCM-SB03			
Field Sample ID									Mason XRF6		QMCM-SB01 0-6"		QMCM-SB01 0-6" DUP		QMCM-SB01 6"-8'		QMCM-SB01 6"-8" DUP		QMCM-SB02 4"-10"		QMCM-SB02 10"-4'		QMCM-SB03 0-6"		QMCM-SB03 6"-5'	
Sample Date									09/06/07		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17	
Sample Interval (bgs)									0 - 0 in		0 - 0.5 ft		0 - 0.5 ft		0.5 - 8 ft		0.5 - 8 ft		0.25 - 0.83 ft		0.83 - 4 ft		0 - 0.5 ft		0.5 - 5 ft	
Sample Description									–		TOPSOIL to 6 in		Field Duplicate		SAND, Medium, gray to 5 ft; SILT SAND, Fine, gray to 8.5 ft		Field Duplicate		GRAVEL, Reddish brown to 1 ft		GRAVEL, Reddish brown to 1 ft; SILT SAND, Fine, gray to 4 ft		TOPSOIL to 6 in, No Cap Present		SAND, Medium, dark gray to 3.5 ft; SAND, Fine to medium, reddish brown to 9 ft, saturated at 5 ft	
									Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Organics - VOCs (ug/kg) (continued)																										
ISOPROPYLBENZENE	98-82-8	3,200	91,000	5.8E+09	2.5E+07 (C)	260,000	2.6E+09	8E+07 (C)	–	–	<79 U	–	<76 U	–	<75 U	–	<69 U	–	**150**	–	<81 U	–	<63 U	–	**140**	–
M,P-XYLENE	1330-20-7	NA	NA	NA	NA	NA	NA	NA	–	–	<160 U	–	<150 U	–	<150 U	–	<140 U	–	**700**	–	<160 U	–	**220**	–	**1,100**	–
METHYLENE CHLORIDE	75-09-2	30,000 (X)	100	6.60E+09	1.30E+06	100	8.30E+09	5.8E+6 (C)	–	–	<160 U	–	<150 U	–	<150 U	–	<140 U	–	<130 U	–	<160 U	–	<130 U	–	<120 U	–
NAPHTHALENE (VOC)	91-20-3V	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	–	–	<390 U	–	<380 U	–	<380 U	–	<350 U	–	**650**	–	<410 U	–	<320 U	–	**1,100**	[2]
N-BUTYLBENZENE	104-51-8	ID	1,600	2E+09	2,500,000	4,600	8.8E+08	8,000,000	–	–	<79 U	–	<76 U	–	<75 U	–	<69 U	–	<66 U	–	<81 U	–	<63 U	–	**70**	–
N-PROPYLBENZENE	103-65-1	ID	1,600 (I)	1.3E+09 (I)	2,500,000 (I)	4,600 (I)	5.9E+08 (I)	8,000,000 (I)	–	–	<79 U	–	<76 U	–	<75 U	–	<69 U	–	**210**	–	<81 U	–	<63 U	–	**140**	–
O-XYLENE	95-47-6	NA	NA	NA	NA	NA	NA	NA	–	–	<79 U	–	<76 U	–	<75 U	–	<69 U	–	**610**	–	<81 U	–	**160**	–	**880**	–
P-ISOPROPYL TOLUENE (p-CYMENE)	99-87-6	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SEC-BUTYLBENZENE	135-98-8	ID	1,600	4.00E+08	2.50E+06	1,600	1.80E+08	8.00E+06	–	–	<79 U	–	<76 U	–	<75 U	–	<69 U	–	<66 U	–	<81 U	–	<63 U	–	<60 U	–
TOLUENE	108-88-3	5,400 (I)	16,000 (I)	2.7E+10 (I)	5E+07 (C,I)	16,000 (I)	1.2E+10 (I)	1.6E+08 (C,I)	–	–	<79 U	–	<76 U	–	<75 U	–	<69 U	–	**1,200**	–	<81 U	–	**190**	–	**1,000**	–
XYLENE - TOTAL	1330-20-7	820 (I)	5,600 (I)	2.9E+11 (I)	4.1E+08 (C,I)	5600 (I)	1.3E+11 (I)	1E+09 (I)	–	–	ND	–	ND	–	ND	–	ND	–	**1,310**	[2]	ND	–	**380**	–	**1,980**	[2]
Organics - Pesticides (ug/kg)																										
4,4'-DDD	72-54-8	NLL	NLL	4.40E+07	95,000	NLL	5.60E+07	4.00E+05	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
4,4'-DDE	72-55-9	NLL	NLL	3.20E+07	45,000	NLL	4.00E+07	1.90E+05	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
4,4'-DDT	50-29-3	NLL	NLL	3.20E+07	57,000	NLL	4.00E+07	2.80E+05	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ALDRIN	309-00-2	NLL	NLL	6.40E+05	1,000	NLL	8.00E+05	4,300	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ALPHA-BHC	319-84-6	ID	18	1.70E+06	2,600	71	2.10E+06	12,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ALPHA-CHLORODANE	5103-71-9	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BETA-BHC	319-85-7	ID	37	5.90E+06	5,400	150	7.40E+06	25,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DIELDRIN	60-57-1	NLL	NLL	6.80E+05	1,100	NLL	8.50E+05	4,700	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDOSULFAN I	959-98-8	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDOSULFAN II	33213-65-9	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDOSULFAN SULFATE	1031-07-8	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDRIN	72-20-8	NLL	NLL	ID	65,000	NLL	ID	1.90E+05	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDRIN ALDEHYDE	7421-93-4	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDRIN KETONE	53494-70-5	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
GAMMA-CHLORDANE	5103-74-2	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
HEPTACHLOR EPOXIDE	102-457-3	NLL	NLL	1.20E+06	3,100	NLL	1.50E+06	9,500	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
METHOXYCHLOR	72-43-5	NA	16,000	ID	1.90E+06	16,000	ID	5.60E+06	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Asbestos (%)																										
ASBESTOS	ASB	NLL	NLL	1% (1.0E+7 (M); 68,000 ppb)	ID	NLL	1% (1.0E+7 (M); 85,000 ppb)	ID	–	–	ND	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

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

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location / Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria
Inorganics - Metals (mg/kg)								
ALUMINUM	7429-90-5	NA	6,900 (B)	ID	50,000 (DD)	6,900 (B)	ID	370,000 (DD)
ANTIMONY	7440-36-0	1.2 (X)	4.3	13,000	180	4.3	5,900	670
ARSENIC	7440-38-2	4.6	4.6	720	7.6	4.6	910	37
BARIUM	7440-39-3	130	1,300 (G)	330,000	37,000	1,300	150,000	130,000
BERYLLIUM	7440-41-7	4.6 (G)	51	1,300	410	51	590	1,600
CADMIUM	7440-43-9	1.6 (G,X)	6.0	1,700	550	6.0	2,200	2,100
CALCIUM	7440-70-2	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	7440-47-3	1,200,000 (G,H,X)	1,000,000 (D,H)	330,000 (H)	790,000 (H)	1,000,000 (D,H)	150,000 (H)	1,000,000 (D,H)
COBALT	7440-48-4	2.0	0.8	13,000	2,600	2.0	5,900	9,000
COPPER	7440-50-8	32 (G)	5,800	130,000	20,000	5,800	59,000	73,000
IRON	7439-89-6	NA	12,000 (B)	ID	160,000	12,000 (B)	ID	580,000
LEAD	7439-92-1	1,900 (G,X)	700	100,000	400	700	44,000	900 (DD)
LITHIUM	7439-93-2	9.8 (B)	9.8 (B)	2,300,000	4,200 (DD)	9.8 (B)	1,000,000	31,000 (DD)
MAGNESIUM	7439-95-4	NA	8,000	6,700,000	1,000,000 (D)	22,000	2,900,000	1,000,000 (D)
MANGANESE	7439-96-5	440 (B,G,X)	440 (B)	3,300	25,000	440 (B)	1,500	90,000
MERCURY	7439-97-6	0.13 (B, Z)	1.7 (Z)	20000 (Z)	160 (Z)	1.7 (Z)	8800 (Z)	580 (Z)
NICKEL	7440-02-0	29 (G)	100	13,000	40,000	100	16,000	150,000
POTASSIUM	7440-09-7	NA	NA	NA	NA	NA	NA	NA
SELENIUM	7782-49-2	0.41 (B)	4.0	130,000	2,600	4.0	59,000	9,600
SILVER	7440-22-4	1.0 (M); 0.027	4.5	6,700	2,500	13	2,900	9,000
SODIUM	7440-23-5	NA	NA	NA	NA	NA	NA	NA
THALLIUM	7440-28-0	1.4	2.3	13,000	35	2.3	5,900	130
VANADIUM	7440-62-2	430	72	ID	750 (DD)	990	ID	5,500 (DD)
ZINC	7440-66-6	62 (G)	2,400	ID	170,000	5,000	ID	630,000
Inorganics - Cyanide (mg/kg)								
CYANIDE	57-12-5	0.1 (P,R)	4.0 (P,R)	250 (P,R)	12 (P,R)	4.0 (P,R)	250 (P,R)	250 (P,R)
Organics - PCBs (ug/kg)								
AROCLOR-1260	11096-82-5	NA	NA	NA	NA	NA	NA	NA
AROCLOR-1262	37324-23-5	NA	NA	NA	NA	NA	NA	NA
TOTAL PCBS	TPCB	NLL	NLL	5,200,000 (J)	1,000 (J,T)	NLL	6,500,000 (J)	1,000 (J,T)

Geographic Location	QUINCY STAMP MILLS AREA																			
Station Name	QMCM-SB04				QMCM-SB05				QMCM-SB06				QMCM-SB07				QMCM-SB08			
Field Sample ID	QMCM-SB04 6"-12"		QMCM-SB04 12"-24"		QMCM-SB05 0-6"		QMCM-SB05 6"-10'		QMCM-SB06 0-6"		QMCM-SB06 6"-12'		QMCM-SB07 0-6"		QMCM-SB07 6"-4'		QMCM-SB08 0-6"		QMCM-SB08 6"-30"	
Sample Date	05/17/17		05/17/17		05/16/17		05/16/17		05/16/17		05/16/17		05/16/17		05/16/17		05/16/17		05/16/17	
Sample Interval (bgs)	0.5 - 1 ft		1 - 2 ft		0 - 0.5 ft		0.5 - 10 ft		0 - 0.5 ft		0.5 - 12 ft		0 - 0.5 ft		0.5 - 4 ft		0 - 0.5 ft		0.5 - 2.5 ft	
Sample Description	SAND, Coarse, gray to 5 ft; saturated at 2 ft		SAND, Coarse, gray to 5 ft; saturated at 2 ft		SAND, Fine, light brown to 6 in		SAND, Fine, reddish brown to 7 ft; SAND, Coarse, brown to 8 ft; SAND, Fine, reddish brown to 10 ft; refusal at 10 ft		TOPSOIL, Silty Loam to 6 in		SAND, Fine, reddish brown to 7 ft		TOPSOIL, Silty Loam to 6 in		SAND, Fine, reddish brown to 4 ft; Refusal at 4 ft - possible bedrock		TOPSOIL to 6 in		SAND, Fine to medium, reddish brown to 2.5 ft; Refusal at 2.5 ft - possible bedrock	
	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	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ANTIMONY	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ARSENIC	8	[2,4,10,11]	8.7	[2,4,10,11]	0.7	–	0.7	–	0.9	–	<1 U	–	2.1	–	0.6	–	4.3	–	0.6	–
BARIUM	53	–	49	–	16	–	11	–	19	–	15	–	17	–	14	–	22	–	9.4	–
BERYLLIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CADMIUM	<0.2 U	–	<0.2 U	–	<0.2 U	–	<0.2 U	–	<0.2 U	–	<0.2 U	–	<0.2 U	–	<0.2 U	–	<0.2 U	–	<0.2 U	–
CALCIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CHROMIUM	13	–	6.7	–	6.7	–	8	–	19	–	8.5	–	11	–	11	–	13	–	5.7	–
COBALT	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
COPPER	370	[2]	110	[2]	12	–	13	–	390	[2]	11	–	310	[2]	150	[2]	4,000	[2]	96	[2]
IRON	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
LEAD	54	–	6.7	–	<1 U	–	<1 U	–	7.5	–	<2 U	–	30	–	14	–	92	–	2	–
LITHIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MAGNESIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MANGANESE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MERCURY	<0.06 U	–	<0.08 U	–	<0.05 U	–	<0.05 U	–	0.6	[2]	<0.05 U	–	<0.06 U	–	<0.05 U	–	0.2	[2]	<0.06 U	–
NICKEL	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
POTASSIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SELENIUM	0.7	[2]	0.8	[2]	<0.2 U	–	<0.2 U	–	<0.2 U	–	<0.4 U	–	<0.2 U	–	<0.2 U	–	<0.2 U	–	<0.2 U	–
SILVER	0.4	–	0.2	–	<0.1 U	–	<0.1 U	–	0.8	–	<0.1 U	–	0.3	–	0.2	–	2.1	[2]	0.3	–
SODIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
THALLIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
VANADIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ZINC	41	–	15	–	7.6	–	9.3	–	54	–	9.3	–	33	–	26	–	48	–	9.4	–
Inorganics - Cyanide (mg/kg)																				
CYANIDE	<0.12 U	–	<0.15 U	–	<0.1 U	–	<0.11 U	–	<0.11 U	–	<0.11 U	–	<0.11 U	–	<0.11 U	–	<0.12 U	–	<0.12 U	–
Organics - PCBs (ug/kg)																				
AROCLOR-1260	<120 U	–	<230 U	–	<100 U	–	<110 U	–	<110 U	–	<110 U	–	<110 U	–	<110 U	–	<420 U	–	<120 U	–
AROCLOR-1262	<120 U	–	<230 U	–	<100 U	–	<110 U	–	<110 U	–	<110 U	–	<110 U	–	<110 U	–	<420 U	–	<120 U	–
TOTAL PCBS	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location		[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	QUINCY STAMP MILLS AREA																			
Station Name	CAS Number								QMCM-SB04				QMCM-SB05				QMCM-SB06				QMCM-SB07				QMCM-SB08			
Field Sample ID									QMCM-SB04 6"-12"		QMCM-SB04 12"-24"		QMCM-SB05 0-6"		QMCM-SB05 6"-10'		QMCM-SB06 0-6"		QMCM-SB06 6"-12'		QMCM-SB07 0-6"		QMCM-SB07 6"-4'		QMCM-SB08 0-6"		QMCM-SB08 6"-30"	
Sample Date									05/17/17		05/17/17		05/16/17		05/16/17		05/16/17		05/16/17		05/16/17		05/16/17		05/16/17		05/16/17	
Sample Interval (bgs)									0.5 - 1 ft		1 - 2 ft		0 - 0.5 ft		0.5 - 10 ft		0 - 0.5 ft		0.5 - 12 ft		0 - 0.5 ft		0.5 - 4 ft		0 - 0.5 ft		0.5 - 2.5 ft	
Sample Description									SAND, Coarse, gray to 5 ft; saturated at 2 ft		SAND, Coarse, gray to 5 ft; saturated at 2 ft		SAND, Fine, light brown to 6 in		SAND, Fine, reddish brown to 7 ft; SAND, Coarse, brown to 8 ft; SAND, Fine, reddish brown to 10 ft; refusal at 10 ft		TOPSOIL, Silty Loam to 6 in		SAND, Fine, reddish brown to 7 ft		TOPSOIL, Silty Loam to 6 in		SAND, Fine, reddish brown to 4 ft; Refusal at 4 ft - possible bedrock		TOPSOIL to 6 in		SAND, Fine to medium, reddish brown to 2.5 ft; Refusal at 2.5 ft - possible bedrock	
									Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Organics - SVOCs (ug/kg)																												
1,1'-BIPHENYL	92-52-4	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2-METHYLNAPHTHALENE (SVOC)	91-57-6S	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07	**1,900**	–	**3,900**	–	<520 U	–	<530 U	–	<530 U	–	<540 U	–	<2800 U	–	<540 U	–	<580 U	–	<590 U	–
ACENAPHTHENE	83-32-9	8,700	300,000	1.4E+10	4.1E+07	880,000	6.2E+09	1.3E+08	<250 U	–	<770 U	–	<210 U	–	<210 U	–	<210 U	–	<220 U	–	<1100 U	–	<220 U	–	<230 U	–	<240 U	–
ACENAPHTHYLENE	208-96-8	ID	5,900	2.3E+09	1,600,000	17,000	1E+09	5,200,000	<250 U	–	<770 U	–	<210 U	–	<210 U	–	<210 U	–	<220 U	–	<1100 U	–	<220 U	–	<230 U	–	<240 U	–
ACETOPHENONE	98-86-2	ID	30,000	3.3E+10	4.7E+07 (C)	88,000	1.4E+10	1.5E+08 (C)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ANTHRACENE	120-12-7	ID	41,000	6.7E+10	2.3E+08	41,000	2.9E+10	7.3E+08	<250 U	–	<770 U	–	<210 U	–	<210 U	–	<210 U	–	<220 U	–	<1100 U	–	<220 U	–	**380**	–	<240 U	–
BENZO(A)ANTHRACENE	56-55-3	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)	**230 J**	–	<770 U	–	<210 U	–	<210 U	–	<210 U	–	<220 U	–	**2,700**	–	<220 U	–	**640**	–	<240 U	–
BENZO(A)PYRENE	50-32-8	NLL	NLL	1,500,000 (Q)	2,000 (Q)	NLL	1,900,000 (Q)	8,000 (Q)	<490 U	–	<1500 U	–	<420 U	–	<430 U	–	<430 U	–	<430 U	–	**2,700**	[10]	<430 U	–	**610**	–	<470 U	–
BENZO(B)FLUORANTHENE	205-99-2	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)	<490 U	–	<1500 U	–	<420 U	–	<430 U	–	<430 U	–	<430 U	–	**4,000**	–	<430 U	–	**810**	–	<470 U	–
BENZO(G,H,I)PERYLENE	191-24-2	NLL	NLL	8E+08 (Q)	2,500,000 (Q)	NLL	3.5E+08 (Q)	7,000,000 (Q)	<490 U	–	<1500 U	–	<420 U	–	<430 U	–	<430 U	–	<430 U	–	<2200 U	–	<430 U	–	<460 U	–	<470 U	–
BENZO(K)FLUORANTHENE	207-08-9	NLL	NLL	ID	200,000 (Q)	NLL	ID	800,000 (Q)	<490 U	–	<1500 U	–	<420 U	–	<430 U	–	<430 U	–	<430 U	–	<2200 U	–	<430 U	–	<460 U	–	<470 U	–
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	NLL	NLL	7E+08	2,800,000	NLL	8.9E+08	1.2E+07 (C)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CARBAZOLE	86-74-8	1,100	9,400	6.2E+07	530,000	39,000	7.8E+07	2,400,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CHRYSENE	218-01-9	NLL	NLL	ID	2,000,000 (Q)	NLL	ID	8,000,000 (Q)	<250 U	–	<770 U	–	<210 U	–	<210 U	–	<210 U	–	<220 U	–	**2,700**	–	<220 U	–	**610**	–	<240 U	–
DIBENZO(A,H)ANTHRACENE	53-70-3	NLL	NLL	ID	2,000 (Q)	NLL	ID	8,000 (Q)	<490 U	–	<1500 U	–	<420 U	–	<430 U	–	<430 U	–	<430 U	–	<2200 U	–	<430 U	–	<460 U	–	<470 U	–
DIBENZOFURAN	132-64-9	1,700	ID	6,700,000	ID	ID	2,900,000	ID	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DI-N-BUTYLPHTHALATE	84-74-2	11000	960,000	3.30E+09	2.70E+07	2.7E+6 (C)	1.50E+09	8.7E+7 (C)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
FLUORANTHENE	206-44-0	5,500	730,000	9.3E+09	4.6E+07	730,000	4.1E+09	1.3E+08	**380**	–	<770 U	–	<210 U	–	<210 U	–	**210**	–	<220 U	–	**8,000**	[2]	**390**	–	**1,700**	–	<240 U	–
FLUORENE	86-73-7	5,300	390,000	9.3E+09	2.7E+07	890,000	4.1E+09	8.7E+07	<250 U	–	<770 U	–	<210 U	–	<210 U	–	<210 U	–	<220 U	–	<1100 U	–	<220 U	–	**220 J**	–	<240 U	–
INDENO(1,2,3-CD)PYRENE	193-39-5	NLL	NLL	ID	20,000	NLL	ID	80,000	<490 U	–	<1500 U	–	<420 U	–	<430 U	–	<430 U	–	<430 U	–	<2200 U	–	<430 U	–	<460 U	–	<470 U	–
NAPHTHALENE (SVOC)	91-20-3S	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	**1,400**	[2]	**3,500**	[2]	<210 U	–	<210 U	–	<210 U	–	<220 U	–	<1100 U	–	<220 U	–	**320**	–	<240 U	–
PHENANTHRENE	85-01-8	2,100	56,000	6,700,000	1,600,000	160,000	2,900,000	5,200,000	**1,100**	–	**1,900**	–	<210 U	–	<210 U	–	<210 U	–	<220 U	–	**6,400**	[2]	**270**	–	**1,700**	–	<240 U	–
PYRENE	129-00-0	ID	480,000	6.7E+09	2.9E+07	480,000	2.9E+09	8.4E+07	**350**	–	<770 U	–	<210 U	–	<210 U	–	<210 U	–	<220 U	–	**6,700**	–	**350**	–	**1,300**	–	<240 U	–
Organics - VOCs (ug/kg)																												
1,2,3-TRIMETHYLBENZENE	526-73-8	NA	NA	NA	NA	NA	NA	NA	**130 J**	–	<110 U	–	<57 U	–	<55 U	–	<55 U	–	<58 U	–	<61 UJ	–	<57 U	–	<64 U	–	<70 U	–
1,2,4-TRIMETHYLBENZENE	95-63-6	570 (I)	2,100 (I)	8.2E+10 (I)	3.2E+07 (C,I)	2,100 (I)	3.6E+10 (I)	1E+08 (C,I)	**360 J**	–	<110 U	–	<57 U	–	<55 U	–	<55 U	–	<58 U	–	<61 UJ	–	<57 U	–	<64 U	–	<70 U	–
1,3,5-TRIMETHYLBENZENE	108-67-8	1,100 (I)	1,800 (I)	8.2E+10 (I)	3.2E+07 (C,I)	1,800 (I)	3.6E+10 (I)	1E+08 (C,I)	<78 UJ	–	<110 U	–	<57 U	–	<55 U	–	<55 U	–	<58 U	–	<61 UJ	–	<57 U	–	<64 U	–	<70 U	–
2-METHYLNAPHTHALENE (VOC)	91-57-6V	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07	**770 J**	–	<530 U	–	<280 U	–	<280 U	–	<280 U	–	<290 U	–	<310 UJ	–	<290 U	–	<320 U	–	<350 U	–
BENZENE	71-43-2	240 (I,X)	100 (I)	3.8E+08 (I)	180,000 (I)	100 (I)	4.7E+08 (I)	840,000 (C,I)	<78 UJ	–	<110 U	–	<57 U	–	<55 U	–	<55 U	–	<58 U	–	<61 UJ	–	<57 U	–	<64 U	–	<70 U	–
CYCLOHEXANE	110-82-7	NA	NA	NA	NA	NA	NA	NA	**490 J**	–	<530 U	–	<280 U	–	<280 U	–	<280 U	–	<290 U	–	<310 UJ	–	<290 U	–	<320 U	–	<350 U	–
ETHYLBENZENE	100-41-4	360 (I)	1,500 (I)	1E+10 (I)	2.2E+07 (C,I)	1,500 (I)	1.3E+10 (I)	7.1E+07 (C, I)	**110 J**	–	<110 U	–	<57 U	–	<55 U	–	<55 U	–	<58 U	–	<61 UJ	–	<57 U	–	<64 U	–	<70 U	–
HEXANE	110-54-3	NA	1.8E+05 (C)	1.30E+10	9.2E+07 (C)	5.1E+5 (C)	5.90E+09	3.0E+8 (C)	**110 J**	–	<110 U	–	<57 U	–	<55 U	–	<55 U	–	<58 U	–	<61 UJ	–	<57 U	–	<64 U	–	<70 U	–

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY STAMP MILLS AREA																			
Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	QMCM-SB04				QMCM-SB05				QMCM-SB06				QMCM-SB07				QMCM-SB08			
Field Sample ID									QMCM-SB04 6"-12"		QMCM-SB04 12"-24"		QMCM-SB05 0-6"		QMCM-SB05 6"-10'		QMCM-SB06 0-6"		QMCM-SB06 6"-12'		QMCM-SB07 0-6"		QMCM-SB07 6"-4'		QMCM-SB08 0-6"		QMCM-SB08 6"-30"	
Sample Date									05/17/17		05/17/17		05/16/17		05/16/17		05/16/17		05/16/17		05/16/17		05/16/17		05/16/17		05/16/17	
Sample Interval (bgs)									0.5 - 1 ft		1 - 2 ft		0 - 0.5 ft		0.5 - 10 ft		0 - 0.5 ft		0.5 - 12 ft		0 - 0.5 ft		0.5 - 4 ft		0 - 0.5 ft		0.5 - 2.5 ft	
Sample Description									SAND, Coarse, gray to 5 ft; saturated at 2 ft		SAND, Coarse, gray to 5 ft; saturated at 2 ft		SAND, Fine, light brown to 6 in		SAND, Fine, reddish brown to 7 ft; SAND, Coarse, brown to 8 ft; SAND, Fine, reddish brown to 10 ft; refusal at 10 ft		TOPSOIL, Silty Loam to 6 in		SAND, Fine, reddish brown to 7 ft		TOPSOIL, Silty Loam to 6 in		SAND, Fine, reddish brown to 4 ft; Refusal at 4 ft - possible bedrock		TOPSOIL to 6 in		SAND, Fine to medium, reddish brown to 2.5 ft; Refusal at 2.5 ft - possible bedrock	
									Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Organics - VOCs (ug/kg) (continued)																												
ISOPROPYLBENZENE	98-82-8	3,200	91,000	5.8E+09	2.5E+07 (C)	260,000	2.6E+09	8E+07 (C)	**87 J**	–	<110 U	–	<57 U	–	<55 U	–	<55 U	–	<58 U	–	<61 UJ	–	<57 U	–	<64 U	–	<70 U	–
M,P-XYLENE	1330-20-7	NA	NA	NA	NA	NA	NA	NA	**690 J**	–	<210 U	–	<110 U	–	<110 U	–	<110 U	–	<120 U	–	<120 UJ	–	<110 U	–	<130 U	–	<140 U	–
METHYLENE CHLORIDE	75-09-2	30,000 (X)	100	6.60E+09	1.30E+06	100	8.30E+09	5.8E+6 (C)	<160 UJ	–	<210 U	–	<110 U	–	<110 U	–	<110 U	–	<120 U	–	<120 UJ	–	<110 U	–	<130 U	–	<140 U	–
NAPHTHALENE (VOC)	91-20-3V	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	**710 J**	–	<530 U	–	<280 U	–	<280 U	–	<280 U	–	<290 U	–	<310 UJ	–	<290 U	–	<320 U	–	<350 U	–
N-BUTYLBENZENE	104-51-8	ID	1,600	2E+09	2,500,000	4,600	8.8E+08	8,000,000	<78 UJ	–	<110 U	–	<57 U	–	<55 U	–	<55 U	–	<58 U	–	<61 UJ	–	<57 U	–	<64 U	–	<70 U	–
N-PROPYLBENZENE	103-65-1	ID	1,600 (I)	1.3E+09 (I)	2,500,000 (I)	4,600 (I)	5.9E+08 (I)	8,000,000 (I)	**91 J**	–	<110 U	–	<57 U	–	<55 U	–	<55 U	–	<58 U	–	<61 UJ	–	<57 U	–	<64 U	–	<70 U	–
O-XYLENE	95-47-6	NA	NA	NA	NA	NA	NA	NA	**580 J**	–	<110 U	–	<57 U	–	<55 U	–	<55 U	–	<58 U	–	<61 UJ	–	<57 U	–	<64 U	–	<70 U	–
P-ISOPROPYL TOLUENE (p-CYMENE)	99-87-6	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SEC-BUTYLBENZENE	135-98-8	ID	1,600	4.00E+08	2.50E+06	1,600	1.80E+08	8.00E+06	<78 UJ	–	<110 U	–	<57 U	–	<55 U	–	<55 U	–	<58 U	–	<61 UJ	–	<57 U	–	<64 U	–	<70 U	–
TOLUENE	108-88-3	5,400 (I)	16,000 (I)	2.7E+10 (I)	5E+07 (C,I)	16,000 (I)	1.2E+10 (I)	1.6E+08 (C,I)	**420 J**	–	**180**	–	<57 U	–	<55 U	–	<55 U	–	<58 U	–	**84 J**	–	<57 U	–	<64 U	–	<70 U	–
XYLENE - TOTAL	1330-20-7	820 (I)	5,600 (I)	2.9E+11 (I)	4.1E+08 (C,I)	5600 (I)	1.3E+11 (I)	1E+09 (I)	**1,270 J**	[2]	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–
Organics - Pesticides (ug/kg)																												
4,4'-DDD	72-54-8	NLL	NLL	4.40E+07	95,000	NLL	5.60E+07	4.00E+05	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
4,4'-DDE	72-55-9	NLL	NLL	3.20E+07	45,000	NLL	4.00E+07	1.90E+05	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
4,4'-DDT	50-29-3	NLL	NLL	3.20E+07	57,000	NLL	4.00E+07	2.80E+05	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ALDRIN	309-00-2	NLL	NLL	6.40E+05	1,000	NLL	8.00E+05	4,300	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ALPHA-BHC	319-84-6	ID	18	1.70E+06	2,600	71	2.10E+06	12,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ALPHA-CHLORODANE	5103-71-9	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BETA-BHC	319-85-7	ID	37	5.90E+06	5,400	150	7.40E+06	25,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DIELDRIN	60-57-1	NLL	NLL	6.80E+05	1,100	NLL	8.50E+05	4,700	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDOSULFAN I	959-98-8	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDOSULFAN II	33213-65-9	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDOSULFAN SULFATE	1031-07-8	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDRIN	72-20-8	NLL	NLL	ID	65,000	NLL	ID	1.90E+05	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDRIN ALDEHYDE	7421-93-4	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDRIN KETONE	53494-70-5	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
GAMMA-CHLORDANE	5103-74-2	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
HEPTACHLOR EPOXIDE	102-457-3	NLL	NLL	1.20E+06	3,100	NLL	1.50E+06	9,500	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
METHOXYCHLOR	72-43-5	NA	16,000	ID	1.90E+06	16,000	ID	5.60E+06	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Asbestos (%)																												
ASBESTOS	ASB	NLL	NLL	1% (1.0E+7 (M); 68,000 ppb)	ID	NLL	1% (1.0E+7 (M); 85,000 ppb)	ID	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

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

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria
Inorganics - Metals (mg/kg)								
ALUMINUM	7429-90-5	NA	6,900 (B)	ID	50,000 (DD)	6,900 (B)	ID	370,000 (DD)
ANTIMONY	7440-36-0	1.2 (X)	4.3	13,000	180	4.3	5,900	670
ARSENIC	7440-38-2	4.6	4.6	720	7.6	4.6	910	37
BARIUM	7440-39-3	130	1,300 (G)	330,000	37,000	1,300	150,000	130,000
BERYLLIUM	7440-41-7	4.6 (G)	51	1,300	410	51	590	1,600
CADMIUM	7440-43-9	1.6 (G,X)	6.0	1,700	550	6.0	2,200	2,100
CALCIUM	7440-70-2	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	7440-47-3	1,200,000 (G,H,X)	1,000,000 (D,H)	330,000 (H)	790,000 (H)	1,000,000 (D,H)	150,000 (H)	1,000,000 (D,H)
COBALT	7440-48-4	2.0	0.8	13,000	2,600	2.0	5,900	9,000
COPPER	7440-50-8	32 (G)	5,800	130,000	20,000	5,800	59,000	73,000
IRON	7439-89-6	NA	12,000 (B)	ID	160,000	12,000 (B)	ID	580,000
LEAD	7439-92-1	1,900 (G,X)	700	100,000	400	700	44,000	900 (DD)
LITHIUM	7439-93-2	9.8 (B)	9.8 (B)	2,300,000	4,200 (DD)	9.8 (B)	1,000,000	31,000 (DD)
MAGNESIUM	7439-95-4	NA	8,000	6,700,000	1,000,000 (D)	22,000	2,900,000	1,000,000 (D)
MANGANESE	7439-96-5	440 (B,G,X)	440 (B)	3,300	25,000	440 (B)	1,500	90,000
MERCURY	7439-97-6	0.13 (B, Z)	1.7 (Z)	20000 (Z)	160 (Z)	1.7 (Z)	8800 (Z)	580 (Z)
NICKEL	7440-02-0	29 (G)	100	13,000	40,000	100	16,000	150,000
POTASSIUM	7440-09-7	NA	NA	NA	NA	NA	NA	NA
SELENIUM	7782-49-2	0.41 (B)	4.0	130,000	2,600	4.0	59,000	9,600
SILVER	7440-22-4	1.0 (M); 0.027	4.5	6,700	2,500	13	2,900	9,000
SODIUM	7440-23-5	NA	NA	NA	NA	NA	NA	NA
THALLIUM	7440-28-0	1.4	2.3	13,000	35	2.3	5,900	130
VANADIUM	7440-62-2	430	72	ID	750 (DD)	990	ID	5,500 (DD)
ZINC	7440-66-6	62 (G)	2,400	ID	170,000	5,000	ID	630,000
Inorganics - Cyanide (mg/kg)								
CYANIDE	57-12-5	0.1 (P,R)	4.0 (P,R)	250 (P,R)	12 (P,R)	4.0 (P,R)	250 (P,R)	250 (P,R)
Organics - PCBs (ug/kg)								
AROCLOR-1260	11096-82-5	NA	NA	NA	NA	NA	NA	NA
AROCLOR-1262	37324-23-5	NA	NA	NA	NA	NA	NA	NA
TOTAL PCBS	TPCB	NLL	NLL	5,200,000 (J)	1,000 (J,T)	NLL	6,500,000 (J)	1,000 (J,T)

Geographic Location	QUINCY STAMP MILLS AREA																			
Station Name	QMCM-SB10				QMCM-SB12				QMCM-SB13				QMCM-SB14				QMCM-SB15			
Field Sample ID	QMCM-SB10 0-6"		QMCM-SB10 6"-10'		QMCM-SB12-0-6"		QMCM-SB12-6"-3'		QMCM-SB13 0-6"		QMCM-SB13 6"-4'		QMCM-SB14 0-6"		QMCM-SB14 6"-3'		QMCM-SB15 6"-12"		QMCM-SB15 12"-4'	
Sample Date	05/16/17		05/16/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17	
Sample Interval (bgs)	0 - 0.5 ft		0.5 - 10 ft		0 - 0.5 ft		0.5 - 3 ft		0 - 0.5 ft		0.5 - 4 ft		0 - 0.5 ft		0.5 - 3 ft		0.5 - 1 ft		1 - 4 ft	
Sample Description	SILTY CLAY, Reddish brown to 1 ft		SAND, Fine to medium, reddish brown to 10 ft; refusal at 10 ft - possible bedrock		SAND, Fine, reddish brown to 1.5 ft		SAND, Coarse, gray to 3 ft		TOPSOIL to 6 in; No Cap Present		SAND, Medium to coarse, gray to 5 ft, saturated at 4 ft		SAND, Medium to coarse, gray to 3 ft		SAND, Medium to coarse, gray to 3 ft		SAND, Medium to coarse, gray to 4 ft		SAND, Medium to coarse, gray to 4 ft	
	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	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ANTIMONY	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ARSENIC	1.9	–	0.9	–	2.6	–	5.3	[2,4,11]	56	[2,4,10,11,17]	14	[2,4,10,11]	4.7	[2,4,11]	1.6	–	14	[2,4,10,11]	0.9	–
BARIUM	15	–	14	–	14	–	25	–	100	–	21	–	45	–	12	–	4.9	–	4.3	–
BERYLLIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CADMIUM	<0.2 U	–	<0.2 U	–	<0.2 U	–	<0.2 U	–	0.3	–	<0.2 U	–	0.3	–	<0.2 U	–	0.4	–	0.2	–
CALCIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CHROMIUM	9.8	–	8.1	–	18	–	10	–	23	–	19	–	24	–	17	–	34	–	27	–
COBALT	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
COPPER	530	[2]	50	[2]	1,100	[2]	370	[2]	540	[2]	1,800	[2]	2,600	[2]	1,400	[2]	3,600	[2]	4,500	[2]
IRON	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
LEAD	6.9	–	1.3	–	49	–	14	–	95	–	4.7	–	7.6	–	13	–	5	–	3.6	–
LITHIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MAGNESIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MANGANESE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MERCURY	<0.05 U	–	<0.06 U	–	0.08	–	<0.06 U	–	0.4	[2]	0.1	–	0.06	–	0.09	–	0.1	–	0.09	–
NICKEL	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
POTASSIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SELENIUM	<0.2 U	–	<0.2 U	–	<0.2 U	–	<0.2 U	–	1.2	[2]	<0.4 U	–	<0.4 U	–	<0.2 U	–	<0.2 U	–	<0.2 U	–
SILVER	0.3	–	<0.1 U	–	0.7	–	0.3	–	2.2	[2]	1.4	[2]	1.2	[2]	0.9	–	3.5	[2]	3.2	[2]
SODIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
THALLIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
VANADIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ZINC	27	–	13	–	52	–	19	–	49	–	60	–	70	[2]	50	–	95	[2]	70	[2]
Inorganics - Cyanide (mg/kg)																				
CYANIDE	<0.11 U	–	<0.11 U	–	<0.11 U	–	<0.12 U	–	<0.13 U	–	<0.12 U	–	<0.11 U	–	<0.11 U	–	<0.1 U	–	<0.11 U	–
Organics - PCBs (ug/kg)																				
AROCLOR-1260	<110 U	–	<110 U	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AROCLOR-1262	<110 U	–	<110 U	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TOTAL PCBS	ND	–	ND	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria
Organics - SVOCs (ug/kg)								
1,1'-BIPHENYL	92-52-4	NA	NA	NA	NA	NA	NA	NA
2-METHYLNAPHTHALENE (SVOC)	91-57-6S	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07
ACENAPHTHENE	83-32-9	8,700	300,000	1.4E+10	4.1E+07	880,000	6.2E+09	1.3E+08
ACENAPHTHYLENE	208-96-8	ID	5,900	2.3E+09	1,600,000	17,000	1E+09	5,200,000
ACETOPHENONE	98-86-2	ID	30,000	3.3E+10	4.7E+07 (C)	88,000	1.4E+10	1.5E+08 (C)
ANTHRACENE	120-12-7	ID	41,000	6.7E+10	2.3E+08	41,000	2.9E+10	7.3E+08
BENZO(A)ANTHRACENE	56-55-3	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)
BENZO(A)PYRENE	50-32-8	NLL	NLL	1,500,000 (Q)	2,000 (Q)	NLL	1,900,000 (Q)	8,000 (Q)
BENZO(B)FLUORANTHENE	205-99-2	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)
BENZO(G,H,I)PERYLENE	191-24-2	NLL	NLL	8E+08 (Q)	2,500,000 (Q)	NLL	3.5E+08 (Q)	7,000,000 (Q)
BENZO(K)FLUORANTHENE	207-08-9	NLL	NLL	ID	200,000 (Q)	NLL	ID	800,000 (Q)
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	NLL	NLL	7E+08	2,800,000	NLL	8.9E+08	1.2E+07 (C)
CARBAZOLE	86-74-8	1,100	9,400	6.2E+07	530,000	39,000	7.8E+07	2,400,000
CHRYSENE	218-01-9	NLL	NLL	ID	2,000,000 (Q)	NLL	ID	8,000,000 (Q)
DIBENZO(A,H)ANTHRACENE	53-70-3	NLL	NLL	ID	2,000 (Q)	NLL	ID	8,000 (Q)
DIBENZOFURAN	132-64-9	1,700	ID	6,700,000	ID	ID	2,900,000	ID
DI-N-BUTYLPHTHALATE	84-74-2	11000	960,000	3.30E+09	2.70E+07	2.7E+6 (C)	1.50E+09	8.7E+7 (C)
FLUORANTHENE	206-44-0	5,500	730,000	9.3E+09	4.6E+07	730,000	4.1E+09	1.3E+08
FLUORENE	86-73-7	5,300	390,000	9.3E+09	2.7E+07	890,000	4.1E+09	8.7E+07
INDENO(1,2,3-CD)PYRENE	193-39-5	NLL	NLL	ID	20,000	NLL	ID	80,000
NAPHTHALENE (SVOC)	91-20-3S	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07
PHENANTHRENE	85-01-8	2,100	56,000	6,700,000	1,600,000	160,000	2,900,000	5,200,000
PYRENE	129-00-0	ID	480,000	6.7E+09	2.9E+07	480,000	2.9E+09	8.4E+07
Organics - VOCs (ug/kg)								
1,2,3-TRIMETHYLBENZENE	526-73-8	NA	NA	NA	NA	NA	NA	NA
1,2,4-TRIMETHYLBENZENE	95-63-6	570 (I)	2,100 (I)	8.2E+10 (I)	3.2E+07 (C,I)	2,100 (I)	3.6E+10 (I)	1E+08 (C,I)
1,3,5-TRIMETHYLBENZENE	108-67-8	1,100 (I)	1,800 (I)	8.2E+10 (I)	3.2E+07 (C,I)	1,800 (I)	3.6E+10 (I)	1E+08 (C,I)
2-METHYLNAPHTHALENE (VOC)	91-57-6V	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07
BENZENE	71-43-2	240 (I,X)	100 (I)	3.8E+08 (I)	180,000 (I)	100 (I)	4.7E+08 (I)	840,000 (C,I)
CYCLOHEXANE	110-82-7	NA	NA	NA	NA	NA	NA	NA
ETHYLBENZENE	100-41-4	360 (I)	1,500 (I)	1E+10 (I)	2.2E+07 (C,I)	1,500 (I)	1.3E+10 (I)	7.1E+07 (C, I)
HEXANE	110-54-3	NA	1.8E+05 (C)	1.30E+10	9.2E+07 (C)	5.1E+5 (C)	5.90E+09	3.0E+8 (C)

Geographic Location	QUINCY STAMP MILLS AREA																			
Station Name	QMCM-SB10				QMCM-SB12				QMCM-SB13				QMCM-SB14				QMCM-SB15			
Field Sample ID	QMCM-SB10 0-6"		QMCM-SB10 6"-10'		QMCM-SB12-0-6"		QMCM-SB12-6"-3'		QMCM-SB13 0-6"		QMCM-SB13 6"-4'		QMCM-SB14 0-6"		QMCM-SB14 6"-3'		QMCM-SB15 6"-12"		QMCM-SB15 12"-4'	
Sample Date	05/16/17		05/16/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17	
Sample Interval (bgs)	0 - 0.5 ft		0.5 - 10 ft		0 - 0.5 ft		0.5 - 3 ft		0 - 0.5 ft		0.5 - 4 ft		0 - 0.5 ft		0.5 - 3 ft		0.5 - 1 ft		1 - 4 ft	
Sample Description	SILTY CLAY, Reddish brown to 1 ft		SAND, Fine to medium, reddish brown to 10 ft; refusal at 10 ft - possible bedrock		SAND, Fine, reddish brown to 1.5 ft		SAND, Coarse, gray to 3 ft		TOPSOIL to 6 in; No Cap Present		SAND, Medium to coarse, gray to 5 ft, saturated at 4 ft		SAND, Medium to coarse, gray to 3 ft		SAND, Medium to coarse, gray to 3 ft		SAND, Medium to coarse, gray to 4 ft		SAND, Medium to coarse, gray to 4 ft	
	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Organics - SVOCs (ug/kg)																				
1,1'-BIPHENYL	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-METHYLNAPHTHALENE (SVOC)	<550 U	--	<550 U	--	560	--	610	--	6,400	[2]	1100	--	<550 U	--	<540 U	--	<520 U	--	<530 U	--
ACENAPHTHENE	<220 U	--	<220 U	--	260	--	<240 U	--	570	--	<230 U	--	<220 U	--	<220 U	--	<210 U	--	<210 U	--
ACENAPHTHYLENE	<220 U	--	<220 U	--	<220 U	--	<240 U	--	<270 U	--	<230 U	--	<220 U	--	<220 U	--	<210 U	--	<210 U	--
ACETOPHENONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ANTHRACENE	<220 U	--	<220 U	--	1,200	--	260	--	1,200	--	<230 U	--	350	--	580	--	<210 U	--	<210 U	--
BENZO(A)ANTHRACENE	<220 U	--	<220 U	--	5,200	--	1700	--	3,500	--	<230 U	--	2,800	--	3,400	--	<210 U	--	<210 U	--
BENZO(A)PYRENE	<440 U	--	<440 U	--	4,800	[10]	1200	--	2,900	[10]	<460 U	--	2,400	[10]	3,100	[10]	<420 U	--	<430 U	--
BENZO(B)FLUORANTHENE	<440 U	--	<440 U	--	5,000	--	1400	--	3,300	--	<460 U	--	2,800	--	3,300	--	<420 U	--	<430 U	--
BENZO(G,H,I)PERYLENE	<440 U	--	<440 U	--	2,600	--	660	--	1,200	--	<460 U	--	1,300	--	1,600	--	<420 U	--	<430 U	--
BENZO(K)FLUORANTHENE	<440 U	--	<440 U	--	1,600	--	450 J	--	890	--	<460 U	--	1,000	--	1,300	--	<420 U	--	<430 U	--
BIS(2-ETHYLHEXYL)PHTHALATE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CARBAZOLE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHRYSENE	<220 U	--	<220 U	--	7,200	--	2,000	--	4,800	--	<230 U	--	3,800	--	4,900	--	<210 U	--	<210 U	--
DIBENZO(A,H)ANTHRACENE	<440 U	--	<440 U	--	700	--	<470 U	--	<530 U	--	<460 U	--	<440 U	--	440	--	<420 U	--	<430 U	--
DIBENZOFURAN	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DI-N-BUTYLPHTHALATE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUORANTHENE	220	--	<220 U	--	8,800	[2]	2,600	--	6,600	[2]	<230 U	--	4,700	--	6,200	[2]	<210 U	--	<210 U	--
FLUORENE	<220 U	--	<220 U	--	290	--	<240 U	--	670	--	<230 U	--	<220 U	--	<220 U	--	<210 U	--	<210 U	--
INDENO(1,2,3-CD)PYRENE	<440 U	--	<440 U	--	2,000	--	540	--	980	--	<460 U	--	980	--	1,200	--	<420 U	--	<430 U	--
NAPHTHALENE (SVOC)	<220 U	--	<220 U	--	410	--	710	--	4,100	[2]	980	[2]	<220 U	--	250	--	<210 U	--	<210 U	--
PHENANTHRENE	<220 U	--	<220 U	--	7,000	[2]	2,000	--	9,900	[2]	590	--	2,400	[2]	4,300	[2]	<210 U	--	<210 U	--
PYRENE	<220 U	--	<220 U	--	17,000	--	4,300	--	10,000	--	<230 U	--	6,900	--	9,200	--	250	--	<210 U	--
Organics - VOCs (ug/kg)																				
1,2,3-TRIMETHYLBENZENE	<61 UJ	--	<60 U	--	61 J	--	<67 U	--	120	--	72	--	<64 U	--	<55 U	--	250	--	<56 U	--
1,2,4-TRIMETHYLBENZENE	<61 UJ	--	<60 U	--	150	--	78	--	290	--	180	--	<64 U	--	61	--	710	[2]	<56 U	--
1,3,5-TRIMETHYLBENZENE	<61 UJ	--	<60 U	--	<63 U	--	<67 U	--	<85 U	--	<68 U	--	<64 U	--	<55 U	--	140	--	<56 U	--
2-METHYLNAPHTHALENE (VOC)	<310 UJ	--	<300 U	--	390	--	<340 U	--	720	--	<340 U	--	<320 U	--	<280 U	--	1,600	--	<280 U	--
BENZENE	<61 UJ	--	<60 U	--	<63 U	--	<67 U	--	<85 U	--	84	--	<64 U	--	<55 U	--	150	[4,11]	<56 U	--
CYCLOHEXANE	<310 UJ	--	<300 U	--	<320 U	--	<340 U	--	<420 U	--	<340 U	--	<320 U	--	<280 U	--	880	--	<280 U	--
ETHYLBENZENE	<61 UJ	--	<60 U	--	<63 U	--	<67 U	--	130	--	65 J	--	<64 U	--	<55 U	--	280	--	<56 U	--
HEXANE	<61 UJ	--	<60 U	--	<63 U	--	<67 U	--	85	--	94	--	<64 U	--	<55 U	--	440	--	<56 U	--

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria
Organics - VOCs (ug/kg) (continued)								
ISOPROPYLBENZENE	98-82-8	3,200	91,000	5.8E+09	2.5E+07 (C)	260,000	2.6E+09	8E+07 (C)
M,P-XYLENE	1330-20-7	NA	NA	NA	NA	NA	NA	NA
METHYLENE CHLORIDE	75-09-2	30,000 (X)	100	6.60E+09	1.30E+06	100	8.30E+09	5.8E+6 (C)
NAPHTHALENE (VOC)	91-20-3V	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07
N-BUTYLBENZENE	104-51-8	ID	1,600	2E+09	2,500,000	4,600	8.8E+08	8,000,000
N-PROPYLBENZENE	103-65-1	ID	1,600 (I)	1.3E+09 (I)	2,500,000 (I)	4,600 (I)	5.9E+08 (I)	8,000,000 (I)
O-XYLENE	95-47-6	NA	NA	NA	NA	NA	NA	NA
P-ISOPROPYL TOLUENE (p-CYMENE)	99-87-6	NA	NA	NA	NA	NA	NA	NA
SEC-BUTYLBENZENE	135-98-8	ID	1,600	4.00E+08	2.50E+06	1,600	1.80E+08	8.00E+06
TOLUENE	108-88-3	5,400 (I)	16,000 (I)	2.7E+10 (I)	5E+07 (C,I)	16,000 (I)	1.2E+10 (I)	1.6E+08 (C,I)
XYLENE - TOTAL	1330-20-7	820 (I)	5,600 (I)	2.9E+11 (I)	4.1E+08 (C,I)	5600 (I)	1.3E+11 (I)	1E+09 (I)
Organics - Pesticides (ug/kg)								
4,4'-DDD	72-54-8	NLL	NLL	4.40E+07	95,000	NLL	5.60E+07	4.00E+05
4,4'-DDE	72-55-9	NLL	NLL	3.20E+07	45,000	NLL	4.00E+07	1.90E+05
4,4'-DDT	50-29-3	NLL	NLL	3.20E+07	57,000	NLL	4.00E+07	2.80E+05
ALDRIN	309-00-2	NLL	NLL	6.40E+05	1,000	NLL	8.00E+05	4,300
ALPHA-BHC	319-84-6	ID	18	1.70E+06	2,600	71	2.10E+06	12,000
ALPHA-CHLORODANE	5103-71-9	NA	NA	NA	NA	NA	NA	NA
BETA-BHC	319-85-7	ID	37	5.90E+06	5,400	150	7.40E+06	25,000
DIELDRIN	60-57-1	NLL	NLL	6.80E+05	1,100	NLL	8.50E+05	4,700
ENDOSULFAN I	959-98-8	NA	NA	NA	NA	NA	NA	NA
ENDOSULFAN II	33213-65-9	NA	NA	NA	NA	NA	NA	NA
ENDOSULFAN SULFATE	1031-07-8	NA	NA	NA	NA	NA	NA	NA
ENDRIN	72-20-8	NLL	NLL	ID	65,000	NLL	ID	1.90E+05
ENDRIN ALDEHYDE	7421-93-4	NA	NA	NA	NA	NA	NA	NA
ENDRIN KETONE	53494-70-5	NA	NA	NA	NA	NA	NA	NA
GAMMA-CHLORDANE	5103-74-2	NA	NA	NA	NA	NA	NA	NA
HEPTACHLOR EPOXIDE	102-457-3	NLL	NLL	1.20E+06	3,100	NLL	1.50E+06	9,500
METHOXYCHLOR	72-43-5	NA	16,000	ID	1.90E+06	16,000	ID	5.60E+06
Asbestos (%)								
ASBESTOS	ASB	NLL	NLL	1% (1.0E+7 (M); 68,000 ppb)	ID	NLL	1% (1.0E+7 (M); 85,000 ppb)	ID

Geographic Location	QUINCY STAMP MILLS AREA																			
Station Name	QMCM-SB10				QMCM-SB12				QMCM-SB13				QMCM-SB14				QMCM-SB15			
Field Sample ID	QMCM-SB10 0-6"		QMCM-SB10 6"-10'		QMCM-SB12-0-6"		QMCM-SB12-6"-3'		QMCM-SB13 0-6"		QMCM-SB13 6"-4'		QMCM-SB14 0-6"		QMCM-SB14 6"-3'		QMCM-SB15 6"-12"		QMCM-SB15 12"-4'	
Sample Date	05/16/17		05/16/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17	
Sample Interval (bgs)	0 - 0.5 ft		0.5 - 10 ft		0 - 0.5 ft		0.5 - 3 ft		0 - 0.5 ft		0.5 - 4 ft		0 - 0.5 ft		0.5 - 3 ft		0.5 - 1 ft		1 - 4 ft	
Sample Description	SILTY CLAY, Reddish brown to 1 ft		SAND, Fine to medium, reddish brown to 10 ft; refusal at 10 ft - possible bedrock		SAND, Fine, reddish brown to 1.5 ft		SAND, Coarse, gray to 3 ft		TOPSOIL to 6 in; No Cap Present		SAND, Medium to coarse, gray to 5 ft, saturated at 4 ft		SAND, Medium to coarse, gray to 3 ft		SAND, Medium to coarse, gray to 3 ft		SAND, Medium to coarse, gray to 4 ft		SAND, Medium to coarse, gray to 4 ft	
	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Organics - VOCs (ug/kg) (continued)																				
ISOPROPYLBENZENE	<61 UJ	--	<60 U	--	<63 U	--	<67 U	--	**95**	--	<68 U	--	<64 U	--	<55 U	--	**100**	--	<56 U	--
M,P-XYLENE	<120 UJ	--	<120 U	--	**240**	--	**150**	--	**610**	--	**340**	--	<130 U	--	**100 J**	--	**1,800**	--	<110 U	--
METHYLENE CHLORIDE	<120 UJ	--	<120 U	--	<130 U	--	<130 U	--	<170 U	--	<140 U	--	<130 U	--	<110 U	--	<110 U	--	<110 U	--
NAPHTHALENE (VOC)	<310 UJ	--	<300 U	--	**320**	--	<340 U	--	**760**	[2]	<340 U	--	<320 U	--	<280 U	--	**1,400**	[2]	<280 U	--
N-BUTYLBENZENE	<61 UJ	--	<60 U	--	<63 U	--	<67 U	--	<85 U	--	<68 U	--	<64 U	--	<55 U	--	**70**	--	<56 U	--
N-PROPYLBENZENE	<61 UJ	--	<60 U	--	<63 U	--	<67 U	--	**120**	--	<68 U	--	<64 U	--	<55 U	--	**140**	--	<56 U	--
O-XYLENE	<61 UJ	--	<60 U	--	**190**	--	**100**	--	**500**	--	**250**	--	<64 U	--	**70**	--	**1,000**	--	<56 U	--
P-ISOPROPYL TOLUENE (p-CYMENE)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SEC-BUTYLBENZENE	<61 UJ	--	<60 U	--	<63 U	--	<67 U	--	<85 U	--	<68 U	--	<64 U	--	<55 U	--	<54 U	--	<56 U	--
TOLUENE	<61 UJ	--	<60 U	--	**200**	--	**180**	--	**510**	--	**340**	--	<64 U	--	**110**	--	**1,600**	--	<56 U	--
XYLENE - TOTAL	ND	--	ND	--	**430**	--	**250**	--	**1,110**	[2]	**590**	--	ND	--	**170 J**	--	**2,800**	[2]	ND	--
Organics - Pesticides (ug/kg)																				
4,4'-DDD	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4,4'-DDE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4,4'-DDT	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ALDRIN	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ALPHA-BHC	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ALPHA-CHLORODANE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BETA-BHC	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DIELDRIN	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ENDOSULFAN I	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ENDOSULFAN II	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ENDOSULFAN SULFATE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ENDRIN	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ENDRIN ALDEHYDE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ENDRIN KETONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GAMMA-CHLORDANE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HEPTACHLOR EPOXIDE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
METHOXYCHLOR	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Asbestos (%)																				
ASBESTOS	--	--	--	--	--	--	--	--	ND	--	--	--	--	--	--	--	--	--	--	--

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

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location / Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria
Inorganics - Metals (mg/kg)								
ALUMINUM	7429-90-5	NA	6,900 (B)	ID	50,000 (DD)	6,900 (B)	ID	370,000 (DD)
ANTIMONY	7440-36-0	1.2 (X)	4.3	13,000	180	4.3	5,900	670
ARSENIC	7440-38-2	4.6	4.6	720	7.6	4.6	910	37
BARIUM	7440-39-3	130	1,300 (G)	330,000	37,000	1,300	150,000	130,000
BERYLLIUM	7440-41-7	4.6 (G)	51	1,300	410	51	590	1,600
CADMIUM	7440-43-9	1.6 (G,X)	6.0	1,700	550	6.0	2,200	2,100
CALCIUM	7440-70-2	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	7440-47-3	1,200,000 (G,H,X)	1,000,000 (D,H)	330,000 (H)	790,000 (H)	1,000,000 (D,H)	150,000 (H)	1,000,000 (D,H)
COBALT	7440-48-4	2.0	0.8	13,000	2,600	2.0	5,900	9,000
COPPER	7440-50-8	32 (G)	5,800	130,000	20,000	5,800	59,000	73,000
IRON	7439-89-6	NA	12,000 (B)	ID	160,000	12,000 (B)	ID	580,000
LEAD	7439-92-1	1,900 (G,X)	700	100,000	400	700	44,000	900 (DD)
LITHIUM	7439-93-2	9.8 (B)	9.8 (B)	2,300,000	4,200 (DD)	9.8 (B)	1,000,000	31,000 (DD)
MAGNESIUM	7439-95-4	NA	8,000	6,700,000	1,000,000 (D)	22,000	2,900,000	1,000,000 (D)
MANGANESE	7439-96-5	440 (B,G,X)	440 (B)	3,300	25,000	440 (B)	1,500	90,000
MERCURY	7439-97-6	0.13 (B, Z)	1.7 (Z)	20000 (Z)	160 (Z)	1.7 (Z)	8800 (Z)	580 (Z)
NICKEL	7440-02-0	29 (G)	100	13,000	40,000	100	16,000	150,000
POTASSIUM	7440-09-7	NA	NA	NA	NA	NA	NA	NA
SELENIUM	7782-49-2	0.41 (B)	4.0	130,000	2,600	4.0	59,000	9,600
SILVER	7440-22-4	1.0 (M); 0.027	4.5	6,700	2,500	13	2,900	9,000
SODIUM	7440-23-5	NA	NA	NA	NA	NA	NA	NA
THALLIUM	7440-28-0	1.4	2.3	13,000	35	2.3	5,900	130
VANADIUM	7440-62-2	430	72	ID	750 (DD)	990	ID	5,500 (DD)
ZINC	7440-66-6	62 (G)	2,400	ID	170,000	5,000	ID	630,000
Inorganics - Cyanide (mg/kg)								
CYANIDE	57-12-5	0.1 (P,R)	4.0 (P,R)	250 (P,R)	12 (P,R)	4.0 (P,R)	250 (P,R)	250 (P,R)
Organics - PCBs (ug/kg)								
AROCLOR-1260	11096-82-5	NA	NA	NA	NA	NA	NA	NA
AROCLOR-1262	37324-23-5	NA	NA	NA	NA	NA	NA	NA
TOTAL PCBS	TPCB	NLL	NLL	5,200,000 (J)	1,000 (J,T)	NLL	6,500,000 (J)	1,000 (J,T)

Geographic Location	QUINCY STAMP MILLS AREA																	
Station Name	QMCM-SB16				QMCM-SB17				QMCM-SB18				QMCM-SB19					
Field Sample ID	QMCM-SB16-0-6"		QMCM-SB16-6"-6'		QMCM-SB17 0-6"		QMCM-SB17 6"-6'		QMCM-SB18 0-6"		QMCM-SB18 6"-8'		QMCM-SB19-0-6"		QMCM-SB19-6"-7'		QMCM-SB19-6"-7' dup	
Sample Date	05/17/17		05/17/17		05/18/17		05/18/17		05/18/17		05/18/17		05/17/17		05/17/17		05/17/17	
Sample Interval (bgs)	0 - 0.5 ft		0.5 - 6 ft		0 - 0.5 ft		0.5 - 6 ft		0 - 0.5 ft		0.5 - 8 ft		0 - 0.5 ft		0.5 - 7 ft		0.5 - 7 ft	
Sample Description	SAND, Medium with gravel, gray to 1 ft		SAND, Fine to medium, reddish brown to 9 ft; saturated at 6 feet		SILTY SAND, Fine, dark gray to 1.5 ft		SAND, Fine to medium, reddish brown to 9 ft; saturated at 6 feet		SILTY SAND, Fine, dark gray to 6ft		SILTY SAND, Fine, dark gray to 6ft; SAND, Fine to medium, reddish brown to 9ft; saturated at 8 ft		SAND, Medium to coarse, gray to 1 ft		SAND, Fine to medium, reddish brown to 9 ft; saturated at 7 ft		Field Duplicate	
	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Inorganics - Metals (mg/kg)																		
ALUMINUM	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ANTIMONY	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ARSENIC	3.2	--	4.3	--	28	[2,4,10,11]	3.1	--	11	[2,4,10,11]	4.9	[2,4,11]	3.3	--	4.4	--	3.4	--
BARIUM	31	--	21	--	45	--	20	--	170	[2]	26	--	14	--	13	--	12	--
BERYLLIUM	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CADMIUM	0.2	--	<0.2 U	--	0.2	--	<0.2 U	--	0.3	--	<0.2 U	--	0.2	--	<0.2 U	--	<0.2 U	--
CALCIUM	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHROMIUM	20	--	8.6	--	12	--	8.1	--	20	--	11	--	22	--	6.7	--	7.8	--
COBALT	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
COPPER	1,400	[2]	510	[2]	530	[2]	210	[2]	1,700	[2]	1,200	[2]	3,200	[2]	240	[2]	180	[2]
IRON	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
LEAD	54	--	3	--	63	--	32	--	720	[4,10,11]	1,800	[4,10,11,17]	5.7	--	4.2	--	3.9	--
LITHIUM	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MAGNESIUM	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MERCURY	0.07	--	<0.06 U	--	0.08	--	<0.06 U	--	0.2	[2]	<0.06 U	--	0.2	[2]	<0.06 U	--	<0.06 U	--
NICKEL	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
POTASSIUM	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SELENIUM	<0.2 U	--	<0.2 U	--	1	[2]	<0.2 U	--	0.3	--	<0.2 U	--	<0.2 U	--	<0.2 U	--	<0.2 U	--
SILVER	0.9	--	0.1	--	1.7	[2]	0.2	--	1.1	[2]	0.7	--	1	--	0.1	--	0.1	--
SODIUM	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
THALLIUM	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VANADIUM	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ZINC	98	[2]	21	--	50	--	61	--	510	[2]	33	--	64	[2]	11	--	12	--
Inorganics - Cyanide (mg/kg)																		
CYANIDE	<0.11 U	--	<0.12 U	--	<0.15 U	--	<0.11 U	--	<0.12 U	--	<0.11 U	--	<0.11 U	--	<0.11 U	--	<0.11 U	--
Organics - PCBs (ug/kg)																		
AROCLOR-1260	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AROCLOR-1262	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOTAL PCBS	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location		[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	QUINCY STAMP MILLS AREA																	
Station Name	CAS Number								QMCM-SB16				QMCM-SB17				QMCM-SB18				QMCM-SB19					
Field Sample ID									QMCM-SB16-0-6"		QMCM-SB16-6"-6'		QMCM-SB17 0-6"		QMCM-SB17 6"-6'		QMCM-SB18 0-6"		QMCM-SB18 6"-8'		QMCM-SB19-0-6"		QMCM-SB19-6"-7'		QMCM-SB19-6"-7' dup	
Sample Date									05/17/17		05/17/17		05/18/17		05/18/17		05/18/17		05/18/17		05/17/17		05/17/17		05/17/17	
Sample Interval (bgs)									0 - 0.5 ft		0.5 - 6 ft		0 - 0.5 ft		0.5 - 6 ft		0 - 0.5 ft		0.5 - 8 ft		0 - 0.5 ft		0.5 - 7 ft		0.5 - 7 ft	
Sample Description									SAND, Medium with gravel, gray to 1 ft		SAND, Fine to medium, reddish brown to 9 ft; saturated at 6 feet		SILTY SAND, Fine, dark gray to 1.5 ft		SAND, Fine to medium, reddish brown to 9 ft; saturated at 6 feet		SILTY SAND, Fine, dark gray to 6ft		SILTY SAND, Fine, dark gray to 6ft; SAND, Fine to medium, reddish brown to 9ft; saturated at 8 ft		SAND, Medium to coarse, gray to 1 ft		SAND, Fine to medium, reddish brown to 9 ft; saturated at 7 ft		Field Duplicate	
									Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Organics - SVOCs (ug/kg)																										
1,1'-BIPHENYL	92-52-4	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2-METHYLNAPHTHALENE (SVOC)	91-57-6S	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07	**1,600**	–	<580 U	–	**2,600**	–	<560 U	–	.	–	**710**	–	**3,500**	–	**2,600**	–	**3,100**	–
ACENAPHTHENE	83-32-9	8,700	300,000	1.4E+10	4.1E+07	880,000	6.2E+09	1.3E+08	<230 U	–	<230 U	–	<300 U	–	<220 U	–	<1200 U	–	<230 U	–	<210 U	–	<220 U	–	<220 U	–
ACENAPHTHYLENE	208-96-8	ID	5,900	2.3E+09	1,600,000	17,000	1E+09	5,200,000	<230 U	–	<230 U	–	<300 U	–	<220 U	–	<1200 U	–	<230 U	–	<210 U	–	<220 U	–	<220 U	–
ACETOPHENONE	98-86-2	ID	30,000	3.3E+10	4.7E+07 (C)	88,000	1.4E+10	1.5E+08 (C)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ANTHRACENE	120-12-7	ID	41,000	6.7E+10	2.3E+08	41,000	2.9E+10	7.3E+08	<230 U	–	<230 U	–	**720**	–	<220 U	–	**2,300**	–	<230 U	–	<210 U	–	<220 U	–	<220 U	–
BENZO(A)ANTHRACENE	56-55-3	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)	**260**	–	<230 U	–	**2,700**	–	**230**	–	**7,200**	–	<230 U	–	**340**	–	<220 U	–	<220 U	–
BENZO(A)PYRENE	50-32-8	NLL	NLL	1,500,000 (Q)	2,000 (Q)	NLL	1,900,000 (Q)	8,000 (Q)	<450 U	–	<460 U	–	**2,400**	[10]	<450 U	–	**5,700**	[10]	<450 U	–	<420 U	–	<440 U	–	<450 U	–
BENZO(B)FLUORANTHENE	205-99-2	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)	<450 U	–	<460 U	–	**2,800**	–	<450 U	–	**6,600**	–	<450 U	–	<420 U	–	<440 U	–	<450 U	–
BENZO(G,H,I)PERYLENE	191-24-2	NLL	NLL	8E+08 (Q)	2,500,000 (Q)	NLL	3.5E+08 (Q)	7,000,000 (Q)	<450 U	–	<460 U	–	**1,100**	–	<450 U	–	**3,000**	–	<450 U	–	<420 U	–	<440 U	–	<450 U	–
BENZO(K)FLUORANTHENE	207-08-9	NLL	NLL	ID	200,000 (Q)	NLL	ID	800,000 (Q)	<450 U	–	<460 U	–	**1,000**	–	<450 U	–	<2500 U	–	<450 U	–	<420 U	–	<440 U	–	<450 U	–
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	NLL	NLL	7E+08	2,800,000	NLL	8.9E+08	1.2E+07 (C)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CARBAZOLE	86-74-8	1,100	9,400	6.2E+07	530,000	39,000	7.8E+07	2,400,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CHRYSENE	218-01-9	NLL	NLL	ID	2,000,000 (Q)	NLL	ID	8,000,000 (Q)	**320**	–	<230 U	–	**3,900**	–	<220 U	–	**9,500**	–	<230 U	–	**340**	–	<220 U	–	<220 U	–
DIBENZO(A,H)ANTHRACENE	53-70-3	NLL	NLL	ID	2,000 (Q)	NLL	ID	8,000 (Q)	<450 U	–	<460 U	–	<600 U	–	<450 U	–	<2500 U	–	<450 U	–	<420 U	–	<440 U	–	<450 U	–
DIBENZOFURAN	132-64-9	1,700	ID	6,700,000	ID	ID	2,900,000	ID	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DI-N-BUTYLPHTHALATE	84-74-2	11000	960,000	3.30E+09	2.70E+07	2.7E+6 (C)	1.50E+09	8.7E+7 (C)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
FLUORANTHENE	206-44-0	5,500	730,000	9.3E+09	4.6E+07	730,000	4.1E+09	1.3E+08	**390**	–	<230 U	–	**5,700**	[2]	**420**	–	**14,000**	[2]	**250**	–	**540**	–	<220 U	–	<220 U	–
FLUORENE	86-73-7	5,300	390,000	9.3E+09	2.7E+07	890,000	4.1E+09	8.7E+07	<230 U	–	<230 U	–	<300 U	–	<220 U	–	<1200 U	–	<230 U	–	<210 U	–	<220 U	–	<220 U	–
INDENO(1,2,3-CD)PYRENE	193-39-5	NLL	NLL	ID	20,000	NLL	ID	80,000	<450 U	–	<460 U	–	**930**	–	<450 U	–	<2500 U	–	<450 U	–	<420 U	–	<440 U	–	<450 U	–
NAPHTHALENE (SVOC)	91-20-3S	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	**1,000**	[2]	**330**	–	**1,900**	[2]	<220 U	–	**2,900**	[2]	**520**	–	**2,200**	[2]	**1,600**	[2]	**2,000**	[2]
PHENANTHRENE	85-01-8	2,100	56,000	6,700,000	1,600,000	160,000	2,900,000	5,200,000	**930**	–	**240**	–	**6,100**	[2]	**660**	–	**18,000**	[2]	**520**	–	**2,400**	[2]	**1,400**	–	**1,500**	–
PYRENE	129-00-0	ID	480,000	6.7E+09	2.9E+07	480,000	2.9E+09	8.4E+07	**490**	–	<230 U	–	**7,400**	–	**660**	–	**22000**	–	**410**	–	**600**	–	<220 U	–	**210 J**	–
Organics - VOCs (ug/kg)																										
1,2,3-TRIMETHYLBENZENE	526-73-8	NA	NA	NA	NA	NA	NA	NA	<64 U	–	<64 U	–	<100 U	–	<63 U	–	<82 U	–	<62 U	–	**270**	–	**110**	–	**160**	–
1,2,4-TRIMETHYLBENZENE	95-63-6	570 (I)	2,100 (I)	8.2E+10 (I)	3.2E+07 (C,I)	2,100 (I)	3.6E+10 (I)	1E+08 (C,I)	**140**	–	**62 J**	–	**100**	–	<63 U	–	**130**	–	**110**	–	**600**	[2]	**300**	–	**470**	–
1,3,5-TRIMETHYLBENZENE	108-67-8	1,100 (I)	1,800 (I)	8.2E+10 (I)	3.2E+07 (C,I)	1,800 (I)	3.6E+10 (I)	1E+08 (C,I)	<64 U	–	<64 U	–	<100 U	–	<63 U	–	<82 U	–	<62 U	–	**140**	–	**63**	–	**88**	–
2-METHYLNAPHTHALENE (VOC)	91-57-6V	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07	<320 U	–	<320 U	–	<510 U	–	<320 U	–	**470**	–	**360**	–	**1,600**	–	**740**	–	**960**	–
BENZENE	71-43-2	240 (I,X)	100 (I)	3.8E+08 (I)	180,000 (I)	100 (I)	4.7E+08 (I)	840,000 (C,I)	<64 U	–	<64 U	–	<100 U	–	<63 U	–	<82 U	–	**76**	–	**120**	[4,11]	**70**	–	**67**	–
CYCLOHEXANE	110-82-7	NA	NA	NA	NA	NA	NA	NA	<320 U	–	<320 U	–	<510 U	–	<320 U	–	<410 U	–	<310 U	–	**680**	–	**350**	–	**510**	–
ETHYLBENZENE	100-41-4	360 (I)	1,500 (I)	1E+10 (I)	2.2E+07 (C,I)	1,500 (I)	1.3E+10 (I)	7.1E+07 (C, I)	<64 U	–	<64 U	–	<100 U	–	<63 U	–	<82 U	–	<62 U	–	**180**	–	**88**	–	**120**	–
HEXANE	110-54-3	NA	1.8E+05 (C)	1.30E+10	9.2E+07 (C)	5.1E+5 (C)	5.90E+09	3.0E+8 (C)	<64 U	–	<64 U	–	<100 U	–	<63 U	–	<82 U	–	<62 U	–	**210**	–	**120**	–	**130**	–

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY STAMP MILLS AREA																	
Station Name	CAS Number								QMCM-SB16				QMCM-SB17				QMCM-SB18				QMCM-SB19					
Field Sample ID		[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	QMCM-SB16-0-6"		QMCM-SB16-6"-6'		QMCM-SB17 0-6"		QMCM-SB17 6"-6'		QMCM-SB18 0-6"		QMCM-SB18 6"-8'		QMCM-SB19-0-6"		QMCM-SB19-6"-7'		QMCM-SB19-6"-7' dup	
Sample Date									05/17/17		05/17/17		05/18/17		05/18/17		05/18/17		05/18/17		05/17/17		05/17/17		05/17/17	
Sample Interval (bgs)									0 - 0.5 ft		0.5 - 6 ft		0 - 0.5 ft		0.5 - 6 ft		0 - 0.5 ft		0.5 - 8 ft		0 - 0.5 ft		0.5 - 7 ft		0.5 - 7 ft	
Sample Description									SAND, Medium with gravel, gray to 1 ft		SAND, Fine to medium, reddish brown to 9 ft; saturated at 6 feet		SILTY SAND, Fine, dark gray to 1.5 ft		SAND, Fine to medium, reddish brown to 9 ft; saturated at 6 feet		SILTY SAND, Fine, dark gray to 6ft		SILTY SAND, Fine, dark gray to 6ft; SAND, Fine to medium, reddish brown to 9ft; saturated at 8 ft		SAND, Medium to coarse, gray to 1 ft		SAND, Fine to medium, reddish brown to 9 ft; saturated at 7 ft		Field Duplicate	
									Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Organics - VOCs (ug/kg) (continued)																										
ISOPROPYLBENZENE	98-82-8	3,200	91,000	5.8E+09	2.5E+07 (C)	260,000	2.6E+09	8E+07 (C)	<64 U	--	<64 U	--	<100 U	--	<63 U	--	<82 U	--	<62 U	--	**130**	--	<63 U	--	**100**	--
M,P-XYLENE	1330-20-7	NA	NA	NA	NA	NA	NA	NA	**250**	--	<130 U	--	**190 J**	--	<130 U	--	**250**	--	**190**	--	**1,100**	--	**570**	--	**740**	--
METHYLENE CHLORIDE	75-09-2	30,000 (X)	100	6.60E+09	1.30E+06	100	8.30E+09	5.8E+6 (C)	<130 U	--	<130 U	--	<200 U	--	<130 U	--	<160 U	--	<120 U	--	<110 U	--	<130 U	--	<130 U	--
NAPHTHALENE (VOC)	91-20-3V	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	<320 U	--	<320 U	--	<510 U	--	<320 U	--	<410 U	--	<310 U	--	**1,300**	[2]	**560**	--	**780**	[2]
N-BUTYLBENZENE	104-51-8	ID	1,600	2E+09	2,500,000	4,600	8.8E+08	8,000,000	<64 U	--	<64 U	--	<100 U	--	<63 U	--	<82 U	--	<62 U	--	**73**	--	<63 U	--	<63 U	--
N-PROPYLBENZENE	103-65-1	ID	1,600 (I)	1.3E+09 (I)	2,500,000 (I)	4,600 (I)	5.9E+08 (I)	8,000,000 (I)	<64 U	--	<64 U	--	<100 U	--	<63 U	--	<82 U	--	<62 U	--	**130**	--	<63 U	--	**88**	--
O-XYLENE	95-47-6	NA	NA	NA	NA	NA	NA	NA	**200**	--	<64 U	--	**140**	--	<63 U	--	**200**	--	**140**	--	**800**	--	**350**	--	**610**	--
P-ISOPROPYL TOLUENE (p-CYMENE)	99-87-6	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SEC-BUTYLBENZENE	135-98-8	ID	1,600	4.00E+08	2.50E+06	1,600	1.80E+08	8.00E+06	<64 U	--	<64 U	--	<100 U	--	<63 U	--	<82 U	--	<62 U	--	<55 U	--	<63 U	--	<63 U	--
TOLUENE	108-88-3	5,400 (I)	16,000 (I)	2.7E+10 (I)	5E+07 (C,I)	16,000 (I)	1.2E+10 (I)	1.6E+08 (C,I)	**200**	--	**73**	--	**140**	--	<63 U	--	**210**	--	**260**	--	**830**	--	**450**	--	**410**	--
XYLENE - TOTAL	1330-20-7	820 (I)	5,600 (I)	2.9E+11 (I)	4.1E+08 (C,I)	5600 (I)	1.3E+11 (I)	1E+09 (I)	**450**	--	ND	--	**330 J**	--	ND	--	**450**	--	**330**	--	**1,900**	[2]	**920**	[2]	**1,350**	[2]
Organics - Pesticides (ug/kg)																										
4,4'-DDD	72-54-8	NLL	NLL	4.40E+07	95,000	NLL	5.60E+07	4.00E+05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4,4'-DDE	72-55-9	NLL	NLL	3.20E+07	45,000	NLL	4.00E+07	1.90E+05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4,4'-DDT	50-29-3	NLL	NLL	3.20E+07	57,000	NLL	4.00E+07	2.80E+05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ALDRIN	309-00-2	NLL	NLL	6.40E+05	1,000	NLL	8.00E+05	4,300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ALPHA-BHC	319-84-6	ID	18	1.70E+06	2,600	71	2.10E+06	12,000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ALPHA-CHLORODANE	5103-71-9	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BETA-BHC	319-85-7	ID	37	5.90E+06	5,400	150	7.40E+06	25,000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DIELDRIN	60-57-1	NLL	NLL	6.80E+05	1,100	NLL	8.50E+05	4,700	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ENDOSULFAN I	959-98-8	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ENDOSULFAN II	33213-65-9	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ENDOSULFAN SULFATE	1031-07-8	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ENDRIN	72-20-8	NLL	NLL	ID	65,000	NLL	ID	1.90E+05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ENDRIN ALDEHYDE	7421-93-4	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ENDRIN KETONE	53494-70-5	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GAMMA-CHLORDANE	5103-74-2	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HEPTACHLOR EPOXIDE	102-457-3	NLL	NLL	1.20E+06	3,100	NLL	1.50E+06	9,500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
METHOXYCHLOR	72-43-5	NA	16,000	ID	1.90E+06	16,000	ID	5.60E+06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Asbestos (%)																										
ASBESTOS	ASB	NLL	NLL	1% (1.0E+7 (M); 68,000 ppb)	ID	NLL	1% (1.0E+7 (M); 85,000 ppb)	ID	--	--	--	--	--	--	--	--	ND	--	--	--	--	--	--	--	--	--

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

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY STAMP MILLS AREA																			
Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	QMCM-SB20				QMCM-SB21				QMCM-SB22				QMCM-SB23				QMCM-SB39			
Field Sample ID									QMCM-SB20-0"-6"		QMCM-SB20-6"-4'		QMCM-SB 21 0-6"		QMCM-SB 21 6"-6'		QMCM-SB22-12"-18"		QMCM-SB22-18"-4'		QMCM-SB23-6"-12"		QMCM-SB23-12"-6'		QMCM-SB-39 6"-12"		QMCM-SB-39 12"-4'	
Sample Date									05/18/17		05/18/17		05/18/17		05/18/17		05/18/17		05/18/17		05/18/17		05/18/17		09/17/17		09/17/17	
Sample Interval (bgs)									0 - 0.5 ft		0.5 - 4 ft		0 - 0.5 ft		0.5 - 6 ft		1 - 1.5 ft		1.5 - 4 ft		0.5 - 1 ft		1 - 6 ft		0.5 - 1 ft		1 - 4 ft	
Sample Description									SILT, Dark gray to 1 ft		SAND, Fine to medium, reddish brown to 4 ft		SAND, Medium to coarse, dark gray to 1.5 ft		SAND, Fine to medium, brown to 9 ft; saturated at 6 ft		SAND, Coarse dark gray to 18 in		SAND, Fine to medium, brown to 5 ft; saturated at 4 ft		CLAY CAP to 1 ft; SAND, Coarse, dark gray to 4 ft		SAND, Coarse, dark gray to 4 ft; SAND, Fine to medium, brown, to 9 ft; saturated at 6 ft		SAND, Medium, gray, saturated at 4 ft		SAND, Medium, gray, saturated at 4 ft	
									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	6,900 (B)	ID	50,000 (DD)	6,900 (B)	ID	370,000 (DD)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ANTIMONY	7440-36-0	1.2 (X)	4.3	13,000	180	4.3	5,900	670	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ARSENIC	7440-38-2	4.6	4.6	720	7.6	4.6	910	37	13	[2,4,10,11]	4.7	[2,4,11]	1.2	–	2.3	–	8.5	[2,4,10,11]	2.8	–	3.3	–	3.2	–	–	–	–	–
BARIUM	7440-39-3	130	1,300 (G)	330,000	37,000	1,300	150,000	130,000	30	–	10	–	8.9	–	7.8	–	42	–	5.2	–	12	–	12	–	–	–	–	–
BERYLLIUM	7440-41-7	4.6 (G)	51	1,300	410	51	590	1,600	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CADMIUM	7440-43-9	1.6 (G,X)	6.0	1,700	550	6.0	2,200	2,100	0.3	–	<0.2 U	–	0.3	–	<0.2 U	–	0.2	–	<0.2 U	–	0.2	–	<0.2 U	–	–	–	–	–
CALCIUM	7440-70-2	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CHROMIUM	7440-47-3	1,200,000 (G,H,X)	1,000,000 (D,H)	330,000 (H)	790,000 (H)	1,000,000 (D,H)	150,000 (H)	1,000,000 (D,H)	20	–	5.4	–	24	–	4.5	–	17	–	4.4	–	18	–	16	–	–	–	–	–
COBALT	7440-48-4	2.0	0.8	13,000	2,600	2.0	5,900	9,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
COPPER	7440-50-8	32 (G)	5,800	130,000	20,000	5,800	59,000	73,000	1,800	[2]	20	–	2,500	[2]	110	[2]	2,100	[2]	82	[2]	1,900	[2]	5,100	[2]	–	–	–	–
IRON	7439-89-6	NA	12,000 (B)	ID	160,000	12,000 (B)	ID	580,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
LEAD	7439-92-1	1,900 (G,X)	700	100,000	400	700	44,000	900 (DD)	20	–	<1 U	–	5.9	–	2	–	11	–	1.1	–	10	–	6.1	–	–	–	–	–
LITHIUM	7439-93-2	9.8 (B)	9.8 (B)	2,300,000	4,200 (DD)	9.8 (B)	1,000,000	31,000 (DD)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MAGNESIUM	7439-95-4	NA	8,000	6,700,000	1,000,000 (D)	22,000	2,900,000	1,000,000 (D)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MANGANESE	7439-96-5	440 (B,G,X)	440 (B)	3,300	25,000	440 (B)	1,500	90,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MERCURY	7439-97-6	0.13 (B, Z)	1.7 (Z)	20000 (Z)	160 (Z)	1.7 (Z)	8800 (Z)	580 (Z)	0.1	–	<0.06 U	–	0.2	[2]	<0.05 U	–	0.2	[2]	<0.05 U	–	0.1	–	0.1	–	–	–	–	–
NICKEL	7440-02-0	29 (G)	100	13,000	40,000	100	16,000	150,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
POTASSIUM	7440-09-7	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SELENIUM	7782-49-2	0.41 (B)	4.0	130,000	2,600	4.0	59,000	9,600	<0.2 U	–	<0.2 U	–	<0.2 U	–	<0.2 U	–	0.3	–	<0.2 U	–	<0.2 U	–	<0.2 U	–	–	–	–	–
SILVER	7440-22-4	1.0 (M); 0.027	4.5	6,700	2,500	13	2,900	9,000	1.1	[2]	<0.1 U	–	1.3	[2]	<0.1 U	–	1.4	[2]	0.1	–	2	[2]	3	[2]	–	–	–	–
SODIUM	7440-23-5	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
THALLIUM	7440-28-0	1.4	2.3	13,000	35	2.3	5,900	130	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
VANADIUM	7440-62-2	430	72	ID	750 (DD)	990	ID	5,500 (DD)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ZINC	7440-66-6	62 (G)	2,400	ID	170,000	5,000	ID	630,000	64	[2]	6.7	–	63	[2]	6.8	–	68	[2]	6.3	–	70	[2]	51	–	–	–	–	–
Inorganics - Cyanide (mg/kg)																												
CYANIDE	57-12-5	0.1 (P,R)	4.0 (P,R)	250 (P,R)	12 (P,R)	4.0 (P,R)	250 (P,R)	250 (P,R)	<0.11 UJ	–	<0.11 U	–	–	–	–	–	<0.19 U	–	<0.11 U	–	<0.11 U	–	<0.11 U	–	–	–	–	–
Organics - PCBs (ug/kg)																												
AROCLOR-1260	11096-82-5	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AROCLOR-1262	37324-23-5	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TOTAL PCBS	TPCB	NLL	NLL	5,200,000 (J)	1,000 (J,T)	NLL	6,500,000 (J)	1,000 (J,T)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria
Organics - SVOCs (ug/kg)								
1,1'-BIPHENYL	92-52-4	NA	NA	NA	NA	NA	NA	NA
2-METHYLNAPHTHALENE (SVOC)	91-57-6S	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07
ACENAPHTHENE	83-32-9	8,700	300,000	1.4E+10	4.1E+07	880,000	6.2E+09	1.3E+08
ACENAPHTHYLENE	208-96-8	ID	5,900	2.3E+09	1,600,000	17,000	1E+09	5,200,000
ACETOPHENONE	98-86-2	ID	30,000	3.3E+10	4.7E+07 (C)	88,000	1.4E+10	1.5E+08 (C)
ANTHRACENE	120-12-7	ID	41,000	6.7E+10	2.3E+08	41,000	2.9E+10	7.3E+08
BENZO(A)ANTHRACENE	56-55-3	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)
BENZO(A)PYRENE	50-32-8	NLL	NLL	1,500,000 (Q)	2,000 (Q)	NLL	1,900,000 (Q)	8,000 (Q)
BENZO(B)FLUORANTHENE	205-99-2	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)
BENZO(G,H,I)PERYLENE	191-24-2	NLL	NLL	8E+08 (Q)	2,500,000 (Q)	NLL	3.5E+08 (Q)	7,000,000 (Q)
BENZO(K)FLUORANTHENE	207-08-9	NLL	NLL	ID	200,000 (Q)	NLL	ID	800,000 (Q)
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	NLL	NLL	7E+08	2,800,000	NLL	8.9E+08	1.2E+07 (C)
CARBAZOLE	86-74-8	1,100	9,400	6.2E+07	530,000	39,000	7.8E+07	2,400,000
CHRYSENE	218-01-9	NLL	NLL	ID	2,000,000 (Q)	NLL	ID	8,000,000 (Q)
DIBENZO(A,H)ANTHRACENE	53-70-3	NLL	NLL	ID	2,000 (Q)	NLL	ID	8,000 (Q)
DIBENZOFURAN	132-64-9	1,700	ID	6,700,000	ID	ID	2,900,000	ID
DI-N-BUTYLPHTHALATE	84-74-2	11000	960,000	3.30E+09	2.70E+07	2.7E+6 (C)	1.50E+09	8.7E+7 (C)
FLUORANTHENE	206-44-0	5,500	730,000	9.3E+09	4.6E+07	730,000	4.1E+09	1.3E+08
FLUORENE	86-73-7	5,300	390,000	9.3E+09	2.7E+07	890,000	4.1E+09	8.7E+07
INDENO(1,2,3-CD)PYRENE	193-39-5	NLL	NLL	ID	20,000	NLL	ID	80,000
NAPHTHALENE (SVOC)	91-20-3S	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07
PHENANTHRENE	85-01-8	2,100	56,000	6,700,000	1,600,000	160,000	2,900,000	5,200,000
PYRENE	129-00-0	ID	480,000	6.7E+09	2.9E+07	480,000	2.9E+09	8.4E+07
Organics - VOCs (ug/kg)								
1,2,3-TRIMETHYLBENZENE	526-73-8	NA	NA	NA	NA	NA	NA	NA
1,2,4-TRIMETHYLBENZENE	95-63-6	570 (I)	2,100 (I)	8.2E+10 (I)	3.2E+07 (C,I)	2,100 (I)	3.6E+10 (I)	1E+08 (C,I)
1,3,5-TRIMETHYLBENZENE	108-67-8	1,100 (I)	1,800 (I)	8.2E+10 (I)	3.2E+07 (C,I)	1,800 (I)	3.6E+10 (I)	1E+08 (C,I)
2-METHYLNAPHTHALENE (VOC)	91-57-6V	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07
BENZENE	71-43-2	240 (I,X)	100 (I)	3.8E+08 (I)	180,000 (I)	100 (I)	4.7E+08 (I)	840,000 (C,I)
CYCLOHEXANE	110-82-7	NA	NA	NA	NA	NA	NA	NA
ETHYLBENZENE	100-41-4	360 (I)	1,500 (I)	1E+10 (I)	2.2E+07 (C,I)	1,500 (I)	1.3E+10 (I)	7.1E+07 (C, I)
HEXANE	110-54-3	NA	1.8E+05 (C)	1.30E+10	9.2E+07 (C)	5.1E+5 (C)	5.90E+09	3.0E+8 (C)

Geographic Location	QUINCY STAMP MILLS AREA																			
Station Name	QMCM-SB20				QMCM-SB21				QMCM-SB22				QMCM-SB23				QMCM-SB39			
Field Sample ID	QMCM-SB20-0"-6"		QMCM-SB20-6"-4'		QMCM-SB 21 0-6"		QMCM-SB 21 6"-6'		QMCM-SB22-12"-18"		QMCM-SB22-18"-4'		QMCM-SB23-6"-12"		QMCM-SB23-12"-6'		QMCM-SB-39 6"-12"		QMCM-SB-39 12"-4'	
Sample Date	05/18/17		05/18/17		05/18/17		05/18/17		05/18/17		05/18/17		05/18/17		05/18/17		09/17/17		09/17/17	
Sample Interval (bgs)	0 - 0.5 ft		0.5 - 4 ft		0 - 0.5 ft		0.5 - 6 ft		1 - 1.5 ft		1.5 - 4 ft		0.5 - 1 ft		1 - 6 ft		0.5 - 1 ft		1 - 4 ft	
Sample Description	SILT, Dark gray to 1 ft		SAND, Fine to medium, reddish brown to 4 ft		SAND, Medium to coarse, dark gray to 1.5 ft		SAND, Fine to medium, brown to 9 ft; saturated at 6 ft		SAND, Coarse dark gray to 18 in		SAND, Fine to medium, brown to 5 ft; saturated at 4 ft		CLAY CAP to 1 ft; SAND, Coarse, dark gray to 4 ft		SAND, Coarse, dark gray to 4 ft; SAND, Fine to medium, brown, to 9 ft; saturated at 6 ft		SAND, Medium, gray, saturated at 4 ft		SAND, Medium, gray, saturated at 4 ft	
	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Organics - SVOCs (ug/kg)																				
1,1'-BIPHENYL	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2-METHYLNAPHTHALENE (SVOC)	**6,400**	[2]	<560 U	–	**970**	–	**530 J**	–	**1,100**	–	<540 U	–	**1,300**	–	**910**	–	<590 U	–	<590 U	–
ACENAPHTHENE	<1100 U	–	<220 U	–	<210 U	–	<220 U	–	<380 U	–	<220 U	–	<210 U	–	<220 U	–	<240 U	–	<240 U	–
ACENAPHTHYLENE	<1100 U	–	<220 U	–	<210 U	–	<220 U	–	<380 U	–	<220 U	–	<210 U	–	<220 U	–	<240 U	–	<240 U	–
ACETOPHENONE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ANTHRACENE	<1100 U	–	<220 U	–	<210 U	–	<220 U	–	<380 U	–	<220 U	–	<210 U	–	<220 U	–	<240 U	–	<240 U	–
BENZO(A)ANTHRACENE	**4,900**	–	<220 U	–	<210 U	–	<220 U	–	**2,200**	–	<220 U	–	**390**	–	**240**	–	<240 U	–	**800**	–
BENZO(A)PYRENE	**3,900**	[10]	<450 U	–	<430 U	–	<430 U	–	**2,100**	[10]	<430 U	–	<430 U	–	<430 U	–	<470 U	–	**720**	–
BENZO(B)FLUORANTHENE	**4,600**	–	<450 U	–	<430 U	–	<430 U	–	**2,400**	–	<430 U	–	<430 U	–	<430 U	–	<470 U	–	**1,000**	–
BENZO(G,H,I)PERYLENE	<2300 U	–	<450 U	–	<430 U	–	<430 U	–	**1,200**	–	<430 U	–	<430 U	–	<430 U	–	<470 U	–	<470 U	–
BENZO(K)FLUORANTHENE	<2300 U	–	<450 U	–	<430 U	–	<430 U	–	**990**	–	<430 U	–	<430 U	–	<430 U	–	<470 U	–	<470 U	–
BIS(2-ETHYLHEXYL)PHTHALATE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CARBAZOLE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CHRYSENE	**6,200**	–	<220 U	–	<210 U	–	<220 U	–	**2,600**	–	<220 U	–	**480**	–	**290**	–	<240 U	–	**830**	–
DIBENZO(A,H)ANTHRACENE	<2300 U	–	<450 U	–	<430 U	–	<430 U	–	<750 U	–	<430 U	–	<430 U	–	<430 U	–	<470 U	–	<470 U	–
DIBENZOFURAN	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DI-N-BUTYLPHTHALATE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
FLUORANTHENE	**8,700**	[2]	<220 U	–	<210 U	–	<220 U	–	**3,900**	–	<220 U	–	**530**	–	**280**	–	**280**	–	**2100**	–
FLUORENE	<1100 U	–	<220 U	–	<210 U	–	<220 U	–	<380 U	–	<220 U	–	<210 U	–	<220 U	–	<240 U	–	<240 U	–
INDENO(1,2,3-CD)PYRENE	<2300 U	–	<450 U	–	<430 U	–	<430 U	–	**900**	–	<430 U	–	<430 U	–	<430 U	–	<470 U	–	<470 U	–
NAPHTHALENE (SVOC)	**4,200**	[2]	<220 U	–	**730**	–	**370**	–	**810**	[2]	<220 U	–	**810**	[2]	**580**	–	<240 U	–	**320**	–
PHENANTHRENE	**9,700**	[2]	<220 U	–	**420**	–	**290**	–	**2,200**	[2]	<220 U	–	**890**	–	**630**	–	<240 U	–	**1,300**	–
PYRENE	**13,000**	–	<220 U	–	<210 U	–	<220 U	–	**5,000**	–	<220 U	–	**630**	–	**400**	–	<240 U	–	**1,600**	–
Organics - VOCs (ug/kg)																				
1,2,3-TRIMETHYLBENZENE	**250**	–	<63 UJ	–	**320**	–	**130 J**	–	**230**	–	<58 U	–	**350**	–	**160**	–	<73 U	–	<69 U	–
1,2,4-TRIMETHYLBENZENE	**640**	[2]	<63 UJ	–	**730**	[2]	**360 J**	–	**460**	–	<58 U	–	**890**	[2]	**410**	–	<73 U	–	<69 U	–
1,3,5-TRIMETHYLBENZENE	**150**	–	<63 UJ	–	**170**	–	**75 J**	–	<150 U	–	<58 U	–	**200**	–	**93**	–	<73 U	–	<69 U	–
2-METHYLNAPHTHALENE (VOC)	**1,400**	–	<310 UJ	–	**1,700**	–	**840 J**	–	**1,000**	–	<290 U	–	**2,000**	–	**1,000**	–	<370 U	–	<340 U	–
BENZENE	**120**	[4,11]	<63 UJ	–	**140**	[4,11]	**84 J**	–	**210**	[4,11]	<58 U	–	**300**	[2,4,11]	**77**	–	<73 U	–	<69 U	–
CYCLOHEXANE	**950**	–	<310 UJ	–	**840**	–	**460 J**	–	<730 U	–	<290 U	–	**1,100**	–	**530**	–	<370 U	–	<340 U	–
ETHYLBENZENE	**200**	–	<63 UJ	–	**190**	–	**210 J**	–	**170**	–	<58 U	–	**240**	–	**95**	–	<73 U	–	<69 U	–
HEXANE	**260**	–	<63 UJ	–	**310**	–	**160 J**	–	**320**	–	<58 U	–	**470**	–	**150**	–	<73 U	–	<69 U	–

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY STAMP MILLS AREA																			
Station Name	CAS Number								QMCM-SB20				QMCM-SB21				QMCM-SB22				QMCM-SB23				QMCM-SB39			
Field Sample ID		[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	QMCM-SB20-0"-6"		QMCM-SB20-6"-4'		QMCM-SB 21 0-6"		QMCM-SB 21 6"-6'		QMCM-SB22-12"-18"		QMCM-SB22-18"-4'		QMCM-SB23-6"-12"		QMCM-SB23-12"-6'		QMCM-SB-39 6"-12"		QMCM-SB-39 12"-4'	
Sample Date									05/18/17		05/18/17		05/18/17		05/18/17		05/18/17		05/18/17		05/18/17		05/18/17		09/17/17		09/17/17	
Sample Interval (bgs)									0 - 0.5 ft		0.5 - 4 ft		0 - 0.5 ft		0.5 - 6 ft		1 - 1.5 ft		1.5 - 4 ft		0.5 - 1 ft		1 - 6 ft		0.5 - 1 ft		1 - 4 ft	
Sample Description									SILT, Dark gray to 1 ft		SAND, Fine to medium, reddish brown to 4 ft		SAND, Medium to coarse, dark gray to 1.5 ft		SAND, Fine to medium, brown to 9 ft; saturated at 6 ft		SAND, Coarse dark gray to 18 in		SAND, Fine to medium, brown to 5 ft; saturated at 4 ft		CLAY CAP to 1 ft; SAND, Coarse, dark gray to 4 ft		SAND, Coarse, dark gray to 4 ft; SAND, Fine to medium, brown, to 9 ft; saturated at 6 ft		SAND, Medium, gray, saturated at 4 ft		SAND, Medium, gray, saturated at 4 ft	
									Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Organics - VOCs (ug/kg) (continued)																												
ISOPROPYLBENZENE	98-82-8	3,200	91,000	5.8E+09	2.5E+07 (C)	260,000	2.6E+09	8E+07 (C)	**100**	--	<63 UJ	--	**110**	--	**130 J**	--	<150 U	--	<58 U	--	**130**	--	<61 U	--	<73 U	--	<69 U	--
M,P-XYLENE	1330-20-7	NA	NA	NA	NA	NA	NA	NA	**1,300**	--	<130 UJ	--	**1,300**	--	**770 J**	--	**1,200**	--	<120 U	--	**1,800**	--	**680**	--	<150 U	--	<140 U	--
METHYLENE CHLORIDE	75-09-2	30,000 (X)	100	6.60E+09	1.30E+06	100	8.30E+09	5.8E+6 (C)	<130 U	--	<130 UJ	--	<110 U	--	<110 UJ	--	<290 U	--	<120 U	--	<110 U	--	<120 U	--	<150 U	--	<140 U	--
NAPHTHALENE (VOC)	91-20-3V	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	**1,300**	[2]	<310 UJ	--	**1,500**	[2]	**750 J**	[2]	**1,000**	[2]	<290 U	--	**1,900**	[2]	**800**	[2]	<370 U	--	<340 U	--
N-BUTYLBENZENE	104-51-8	ID	1,600	2E+09	2,500,000	4,600	8.8E+08	8,000,000	**70**	--	<63 UJ	--	**91**	--	<56 UJ	--	<150 U	--	<58 U	--	**91**	--	<61 U	--	<73 U	--	<69 U	--
N-PROPYLBENZENE	103-65-1	ID	1,600 (I)	1.3E+09 (I)	2,500,000 (I)	4,600 (I)	5.9E+08 (I)	8,000,000 (I)	**150**	--	<63 UJ	--	**120**	--	**120 J**	--	<150 U	--	<58 U	--	**160**	--	**62**	--	<73 U	--	<69 U	--
O-XYLENE	95-47-6	NA	NA	NA	NA	NA	NA	NA	**1,000**	--	<63 UJ	--	**970**	--	**560 J**	--	**720**	--	<58 U	--	**1,200**	--	**470**	--	<73 U	--	<69 U	--
P-ISOPROPYL TOLUENE (p-CYMENE)	99-87-6	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SEC-BUTYLBENZENE	135-98-8	ID	1,600	4.00E+08	2.50E+06	1,600	1.80E+08	8.00E+06	<66 U	--	<63 UJ	--	<56 U	--	<56 UJ	--	<150 U	--	<58 U	--	<55 U	--	<61 U	--	<73 U	--	<69 U	--
TOLUENE	108-88-3	5,400 (I)	16,000 (I)	2.7E+10 (I)	5E+07 (C,I)	16,000 (I)	1.2E+10 (I)	1.6E+08 (C,I)	**960**	--	<63 UJ	--	**940**	--	**690 J**	--	**1,400**	--	<58 U	--	**1,600**	--	**530**	--	<73 U	--	<69 U	--
XYLENE - TOTAL	1330-20-7	820 (I)	5,600 (I)	2.9E+11 (I)	4.1E+08 (C,I)	5600 (I)	1.3E+11 (I)	1E+09 (I)	**2,300**	[2]	ND	--	**2,270**	[2]	**1,330 J**	[2]	**1,920**	[2]	ND	--	**3,000**	[2]	**1,150**	[2]	ND	--	ND	--
Organics - Pesticides (ug/kg)																												
4,4'-DDD	72-54-8	NLL	NLL	4.40E+07	95,000	NLL	5.60E+07	4.00E+05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4,4'-DDE	72-55-9	NLL	NLL	3.20E+07	45,000	NLL	4.00E+07	1.90E+05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4,4'-DDT	50-29-3	NLL	NLL	3.20E+07	57,000	NLL	4.00E+07	2.80E+05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ALDRIN	309-00-2	NLL	NLL	6.40E+05	1,000	NLL	8.00E+05	4,300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ALPHA-BHC	319-84-6	ID	18	1.70E+06	2,600	71	2.10E+06	12,000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ALPHA-CHLORODANE	5103-71-9	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BETA-BHC	319-85-7	ID	37	5.90E+06	5,400	150	7.40E+06	25,000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DIELDRIN	60-57-1	NLL	NLL	6.80E+05	1,100	NLL	8.50E+05	4,700	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ENDOSULFAN I	959-98-8	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ENDOSULFAN II	33213-65-9	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ENDOSULFAN SULFATE	1031-07-8	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ENDRIN	72-20-8	NLL	NLL	ID	65,000	NLL	ID	1.90E+05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ENDRIN ALDEHYDE	7421-93-4	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ENDRIN KETONE	53494-70-5	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GAMMA-CHLORDANE	5103-74-2	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HEPTACHLOR EPOXIDE	102-457-3	NLL	NLL	1.20E+06	3,100	NLL	1.50E+06	9,500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
METHOXYCHLOR	72-43-5	NA	16,000	ID	1.90E+06	16,000	ID	5.60E+06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Asbestos (%)																												
ASBESTOS	ASB	NLL	NLL	1% (1.0E+7 (M); 68,000 ppb)	ID	NLL	1% (1.0E+7 (M); 85,000 ppb)	ID	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

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

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY STAMP MILLS AREA																					
Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	QMCM-SB40				QMCM-SB41				QMCM-SB42				QMCM-SS01		QMCM-SS02		QMCM-SS03		QMCM-SS04	
Field Sample ID									QMCM-SB-40 6"-12"		QMCM-SB-40 12"-24"		QMCM-SB-41 6"-12"		QMCM-SB-41 12"-3'		QMCM-SB-42 6"-12"		QMCM-SB-42 12"-24"		QMCM-SS01-0"-6"		QMCM-SS02-0"-6"		QMCM-SS03-0"-6"		QMCM-SS04-0"-6"	
Sample Date									09/17/17		09/17/17		09/17/17		09/17/17		09/17/17		09/17/17		05/16/17		05/16/17		05/16/17		05/16/17	
Sample Interval (bgs)									0.5 - 1 ft		1 - 2 ft		0.5 - 1 ft		1 - 3 ft		0.5 - 1 ft		1 - 2 ft		0 - 0.5 ft		0 - 0.5 ft		0 - 0.5 ft		0 - 0.5 ft	
Sample Description									SAND, Medium, gray, saturated at 2 ft		SAND, Medium, gray, saturated at 2 ft		SAND, Medium, gray, saturated at 3 ft		SAND, Medium, gray, saturated at 3 ft		SAND, Medium, gray, saturated at 2 ft		SAND, Medium, gray, saturated at 2 ft		Dark brown, fine SAND		Reddish-brown, medium SAND; dry		Gray gravelly SAND; dry		Brown fine SAND; moist	
									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	6,900 (B)	ID	50,000 (DD)	6,900 (B)	ID	370,000 (DD)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ANTIMONY	7440-36-0	1.2 (X)	4.3	13,000	180	4.3	5,900	670	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ARSENIC	7440-38-2	4.6	4.6	720	7.6	4.6	910	37	–	–	–	–	–	–	–	–	–	–	–	–	**0.8**	–	**0.6**	–	**3**	–	**1**	–
BARIUM	7440-39-3	130	1,300 (G)	330,000	37,000	1,300	150,000	130,000	–	–	–	–	–	–	–	–	–	–	–	–	**17**	–	**6.7**	–	**14**	–	**18**	–
BERYLLIUM	7440-41-7	4.6 (G)	51	1,300	410	51	590	1,600	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CADMIUM	7440-43-9	1.6 (G,X)	6.0	1,700	550	6.0	2,200	2,100	–	–	–	–	–	–	–	–	–	–	–	–	**0.5**	–	<0.2 U	–	**0.7**	–	<0.2 U	–
CALCIUM	7440-70-2	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CHROMIUM	7440-47-3	1,200,000 (G,H,X)	1,000,000 (D,H)	330,000 (H)	790,000 (H)	1,000,000 (D,H)	150,000 (H)	1,000,000 (D,H)	–	–	–	–	–	–	–	–	–	–	–	–	**54**	–	**17**	–	**38**	–	**8**	–
COBALT	7440-48-4	2.0	0.8	13,000	2,600	2.0	5,900	9,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
COPPER	7440-50-8	32 (G)	5,800	130,000	20,000	5,800	59,000	73,000	–	–	–	–	–	–	–	–	–	–	–	–	**1,100**	[2]	**1,800**	[2]	**10,000**	[2,4,11]	**71**	[2]
IRON	7439-89-6	NA	12,000 (B)	ID	160,000	12,000 (B)	ID	580,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
LEAD	7439-92-1	1,900 (G,X)	700	100,000	400	700	44,000	900 (DD)	–	–	–	–	–	–	–	–	–	–	–	–	**110**	–	**15**	–	**450**	[10]	**9**	–
LITHIUM	7439-93-2	9.8 (B)	9.8 (B)	2,300,000	4,200 (DD)	9.8 (B)	1,000,000	31,000 (DD)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MAGNESIUM	7439-95-4	NA	8,000	6,700,000	1,000,000 (D)	22,000	2,900,000	1,000,000 (D)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MANGANESE	7439-96-5	440 (B,G,X)	440 (B)	3,300	25,000	440 (B)	1,500	90,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MERCURY	7439-97-6	0.13 (B, Z)	1.7 (Z)	20000 (Z)	160 (Z)	1.7 (Z)	8800 (Z)	580 (Z)	–	–	–	–	–	–	–	–	–	–	–	–	**8.3**	[2,4,11]	<0.05 U	–	**0.4**	[2]	<0.06 U	–
NICKEL	7440-02-0	29 (G)	100	13,000	40,000	100	16,000	150,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
POTASSIUM	7440-09-7	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SELENIUM	7782-49-2	0.41 (B)	4.0	130,000	2,600	4.0	59,000	9,600	–	–	–	–	–	–	–	–	–	–	–	–	<0.2 U	–	<0.2 U	–	<0.2 U	–	<0.2 U	–
SILVER	7440-22-4	1.0 (M); 0.027	4.5	6,700	2,500	13	2,900	9,000	–	–	–	–	–	–	–	–	–	–	–	–	**3**	[2]	**1.2**	[2]	**18**	[2,4,11]	**0.1**	–
SODIUM	7440-23-5	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
THALLIUM	7440-28-0	1.4	2.3	13,000	35	2.3	5,900	130	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
VANADIUM	7440-62-2	430	72	ID	750 (DD)	990	ID	5,500 (DD)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ZINC	7440-66-6	62 (G)	2,400	ID	170,000	5,000	ID	630,000	–	–	–	–	–	–	–	–	–	–	–	–	**290**	[2]	**53**	–	**240 J**	[2]	**24**	–
Inorganics - Cyanide (mg/kg)																														
CYANIDE	57-12-5	0.1 (P,R)	4.0 (P,R)	250 (P,R)	12 (P,R)	4.0 (P,R)	250 (P,R)	250 (P,R)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Organics - PCBs (ug/kg)																														
AROCLOR-1260	11096-82-5	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AROCLOR-1262	37324-23-5	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TOTAL PCBS	TPCB	NLL	NLL	5,200,000 (J)	1,000 (J,T)	NLL	6,500,000 (J)	1,000 (J,T)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria
Organics - SVOCs (ug/kg)								
1,1'-BIPHENYL	92-52-4	NA	NA	NA	NA	NA	NA	NA
2-METHYLNAPHTHALENE (SVOC)	91-57-6S	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07
ACENAPHTHENE	83-32-9	8,700	300,000	1.4E+10	4.1E+07	880,000	6.2E+09	1.3E+08
ACENAPHTHYLENE	208-96-8	ID	5,900	2.3E+09	1,600,000	17,000	1E+09	5,200,000
ACETOPHENONE	98-86-2	ID	30,000	3.3E+10	4.7E+07 (C)	88,000	1.4E+10	1.5E+08 (C)
ANTHRACENE	120-12-7	ID	41,000	6.7E+10	2.3E+08	41,000	2.9E+10	7.3E+08
BENZO(A)ANTHRACENE	56-55-3	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)
BENZO(A)PYRENE	50-32-8	NLL	NLL	1,500,000 (Q)	2,000 (Q)	NLL	1,900,000 (Q)	8,000 (Q)
BENZO(B)FLUORANTHENE	205-99-2	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)
BENZO(G,H,I)PERYLENE	191-24-2	NLL	NLL	8E+08 (Q)	2,500,000 (Q)	NLL	3.5E+08 (Q)	7,000,000 (Q)
BENZO(K)FLUORANTHENE	207-08-9	NLL	NLL	ID	200,000 (Q)	NLL	ID	800,000 (Q)
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	NLL	NLL	7E+08	2,800,000	NLL	8.9E+08	1.2E+07 (C)
CARBAZOLE	86-74-8	1,100	9,400	6.2E+07	530,000	39,000	7.8E+07	2,400,000
CHRYSENE	218-01-9	NLL	NLL	ID	2,000,000 (Q)	NLL	ID	8,000,000 (Q)
DIBENZO(A,H)ANTHRACENE	53-70-3	NLL	NLL	ID	2,000 (Q)	NLL	ID	8,000 (Q)
DIBENZOFURAN	132-64-9	1,700	ID	6,700,000	ID	ID	2,900,000	ID
DI-N-BUTYLPHTHALATE	84-74-2	11000	960,000	3.30E+09	2.70E+07	2.7E+6 (C)	1.50E+09	8.7E+7 (C)
FLUORANTHENE	206-44-0	5,500	730,000	9.3E+09	4.6E+07	730,000	4.1E+09	1.3E+08
FLUORENE	86-73-7	5,300	390,000	9.3E+09	2.7E+07	890,000	4.1E+09	8.7E+07
INDENO(1,2,3-CD)PYRENE	193-39-5	NLL	NLL	ID	20,000	NLL	ID	80,000
NAPHTHALENE (SVOC)	91-20-3S	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07
PHENANTHRENE	85-01-8	2,100	56,000	6,700,000	1,600,000	160,000	2,900,000	5,200,000
PYRENE	129-00-0	ID	480,000	6.7E+09	2.9E+07	480,000	2.9E+09	8.4E+07
Organics - VOCs (ug/kg)								
1,2,3-TRIMETHYLBENZENE	526-73-8	NA	NA	NA	NA	NA	NA	NA
1,2,4-TRIMETHYLBENZENE	95-63-6	570 (I)	2,100 (I)	8.2E+10 (I)	3.2E+07 (C,I)	2,100 (I)	3.6E+10 (I)	1E+08 (C,I)
1,3,5-TRIMETHYLBENZENE	108-67-8	1,100 (I)	1,800 (I)	8.2E+10 (I)	3.2E+07 (C,I)	1,800 (I)	3.6E+10 (I)	1E+08 (C,I)
2-METHYLNAPHTHALENE (VOC)	91-57-6V	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07
BENZENE	71-43-2	240 (I,X)	100 (I)	3.8E+08 (I)	180,000 (I)	100 (I)	4.7E+08 (I)	840,000 (C,I)
CYCLOHEXANE	110-82-7	NA	NA	NA	NA	NA	NA	NA
ETHYLBENZENE	100-41-4	360 (I)	1,500 (I)	1E+10 (I)	2.2E+07 (C,I)	1,500 (I)	1.3E+10 (I)	7.1E+07 (C, I)
HEXANE	110-54-3	NA	1.8E+05 (C)	1.30E+10	9.2E+07 (C)	5.1E+5 (C)	5.90E+09	3.0E+8 (C)

Geographic Location	QUINCY STAMP MILLS AREA																			
Station Name	QMCM-SB40				QMCM-SB41				QMCM-SB42				QMCM-SS01		QMCM-SS02		QMCM-SS03		QMCM-SS04	
Field Sample ID	QMCM-SB-40 6"-12"		QMCM-SB-40 12"-24"		QMCM-SB-41 6"-12"		QMCM-SB-41 12"-3'		QMCM-SB-42 6"-12"		QMCM-SB-42 12"-24"		QMCM-SS01-0"-6"		QMCM-SS02-0"-6"		QMCM-SS03-0"-6"		QMCM-SS04-0"-6"	
Sample Date	09/17/17		09/17/17		09/17/17		09/17/17		09/17/17		09/17/17		05/16/17		05/16/17		05/16/17		05/16/17	
Sample Interval (bgs)	0.5 - 1 ft		1 - 2 ft		0.5 - 1 ft		1 - 3 ft		0.5 - 1 ft		1 - 2 ft		0 - 0.5 ft		0 - 0.5 ft		0 - 0.5 ft		0 - 0.5 ft	
Sample Description	SAND, Medium, gray, saturated at 2 ft		SAND, Medium, gray, saturated at 2 ft		SAND, Medium, gray, saturated at 3 ft		SAND, Medium, gray, saturated at 3 ft		SAND, Medium, gray, saturated at 2 ft		SAND, Medium, gray, saturated at 2 ft		Dark brown, fine SAND		Reddish-brown, medium SAND; dry		Gray gravelly SAND; dry		Brown fine SAND; moist	
	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Organics - SVOCs (ug/kg)																				
1,1'-BIPHENYL	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-METHYLNAPHTHALENE (SVOC)	<590 U	--	<630 U	--	<590 U	--	**1,400**	--	**1,800**	--	**1,300**	--	--	--	--	--	--	--	--	--
ACENAPHTHENE	<240 U	--	<250 U	--	<240 U	--	<240 U	--	<250 U	--	<260 U	--	--	--	--	--	--	--	--	--
ACENAPHTHYLENE	<240 U	--	<250 U	--	<240 U	--	<240 U	--	<250 U	--	<260 U	--	--	--	--	--	--	--	--	--
ACETOPHENONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ANTHRACENE	<240 U	--	<250 U	--	<240 U	--	**230 J**	--	<250 U	--	<260 U	--	--	--	--	--	--	--	--	--
BENZO(A)ANTHRACENE	<240 U	--	<250 U	--	<240 U	--	**1,000**	--	**250**	--	<260 U	--	--	--	--	--	--	--	--	--
BENZO(A)PYRENE	<470 U	--	<500 U	--	<470 U	--	**860**	--	<500 U	--	<510 U	--	--	--	--	--	--	--	--	--
BENZO(B)FLUORANTHENE	<470 U	--	<500 U	--	<470 U	--	**1,100**	--	<500 U	--	<510 U	--	--	--	--	--	--	--	--	--
BENZO(G,H,I)PERYLENE	<470 U	--	<500 U	--	<470 U	--	**450 J**	--	<500 U	--	<510 U	--	--	--	--	--	--	--	--	--
BENZO(K)FLUORANTHENE	<470 U	--	<500 U	--	<470 U	--	<470 U	--	<500 U	--	<510 U	--	--	--	--	--	--	--	--	--
BIS(2-ETHYLHEXYL)PHTHALATE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CARBAZOLE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHRYSENE	<240 U	--	<250 U	--	<240 U	--	**1,100**	--	**320**	--	<260 U	--	--	--	--	--	--	--	--	--
DIBENZO(A,H)ANTHRACENE	<470 U	--	<500 U	--	<470 U	--	<470 U	--	<500 U	--	<510 U	--	--	--	--	--	--	--	--	--
DIBENZOFURAN	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DI-N-BUTYLPHTHALATE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUORANTHENE	**360**	--	**450**	--	<240 U	--	**1,800**	--	**470**	--	**280**	--	--	--	--	--	--	--	--	--
FLUORENE	<240 U	--	<250 U	--	<240 U	--	<240 U	--	<250 U	--	<260 U	--	--	--	--	--	--	--	--	--
INDENO(1,2,3-CD)PYRENE	<470 U	--	<500 U	--	<470 U	--	<470 U	--	<500 U	--	<510 U	--	--	--	--	--	--	--	--	--
NAPHTHALENE (SVOC)	<240 U	--	**390**	--	<240 U	--	**1,100**	[2]	**1,200**	[2]	**1,000**	[2]	--	--	--	--	--	--	--	--
PHENANTHRENE	<240 U	--	**460**	--	<240 U	--	**1,500**	--	**940**	--	**670**	--	--	--	--	--	--	--	--	--
PYRENE	**270**	--	**330**	--	<240 U	--	**1,800**	--	**390**	--	<260 U	--	--	--	--	--	--	--	--	--
Organics - VOCs (ug/kg)																				
1,2,3-TRIMETHYLBENZENE	<69 U	--	<74 U	--	<69 UJ	--	<72 U	--	<110 U	--	<80 U	--	--	--	--	--	--	--	--	--
1,2,4-TRIMETHYLBENZENE	<69 U	--	**160**	--	<69 UJ	--	**79**	--	**170**	--	<80 U	--	--	--	--	--	--	--	--	--
1,3,5-TRIMETHYLBENZENE	<69 U	--	<74 U	--	<69 UJ	--	<72 U	--	<110 U	--	<80 U	--	--	--	--	--	--	--	--	--
2-METHYLNAPHTHALENE (VOC)	<350 U	--	<370 U	--	<340 UJ	--	<360 U	--	<550 U	--	<400 U	--	--	--	--	--	--	--	--	--
BENZENE	<69 U	--	<74 U	--	<69 UJ	--	<72 U	--	<110 U	--	<80 U	--	--	--	--	--	--	--	--	--
CYCLOHEXANE	<350 U	--	<370 U	--	<340 UJ	--	<360 U	--	<550 U	--	<400 U	--	--	--	--	--	--	--	--	--
ETHYLBENZENE	<69 U	--	<74 U	--	<69 UJ	--	<72 U	--	<110 U	--	<80 U	--	--	--	--	--	--	--	--	--
HEXANE	<69 U	--	<74 U	--	<69 UJ	--	<72 U	--	**110**	--	<80 U	--	--	--	--	--	--	--	--	--

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY STAMP MILLS AREA																					
Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	QMCM-SB40				QMCM-SB41				QMCM-SB42				QMCM-SS01		QMCM-SS02		QMCM-SS03		QMCM-SS04	
Field Sample ID									QMCM-SB-40 6"-12"		QMCM-SB-40 12"-24"		QMCM-SB-41 6"-12"		QMCM-SB-41 12"-3'		QMCM-SB-42 6"-12"		QMCM-SB-42 12"-24"		QMCM-SS01-0"-6"		QMCM-SS02-0"-6"		QMCM-SS03-0"-6"		QMCM-SS04-0"-6"	
Sample Date									09/17/17		09/17/17		09/17/17		09/17/17		09/17/17		09/17/17		05/16/17		05/16/17		05/16/17		05/16/17	
Sample Interval (bgs)									0.5 - 1 ft		1 - 2 ft		0.5 - 1 ft		1 - 3 ft		0.5 - 1 ft		1 - 2 ft		0 - 0.5 ft		0 - 0.5 ft		0 - 0.5 ft		0 - 0.5 ft	
Sample Description									SAND, Medium, gray, saturated at 2 ft		SAND, Medium, gray, saturated at 2 ft		SAND, Medium, gray, saturated at 3 ft		SAND, Medium, gray, saturated at 3 ft		SAND, Medium, gray, saturated at 2 ft		SAND, Medium, gray, saturated at 2 ft		Dark brown, fine SAND		Reddish-brown, medium SAND; dry		Gray gravelly SAND; dry		Brown fine SAND; moist	
									Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Organics - VOCs (ug/kg) (continued)																														
ISOPROPYLBENZENE	98-82-8	3,200	91,000	5.8E+09	2.5E+07 (C)	260,000	2.6E+09	8E+07 (C)	<69 U	--	<74 U	--	<69 UJ	--	<72 U	--	<110 U	--	<80 U	--	--	--	--	--	--	--	--	--
M,P-XYLENE	1330-20-7	NA	NA	NA	NA	NA	NA	NA	<140 U	--	**180**	--	<140 UJ	--	**140**	--	**310**	--	<160 U	--	--	--	--	--	--	--	--	--
METHYLENE CHLORIDE	75-09-2	30,000 (X)	100	6.60E+09	1.30E+06	100	8.30E+09	5.8E+6 (C)	<140 U	--	<150 U	--	<140 UJ	--	<140 U	--	<220 U	--	<160 U	--	--	--	--	--	--	--	--	--
NAPHTHALENE (VOC)	91-20-3V	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	<350 U	--	<370 U	--	<340 UJ	--	<360 U	--	<550 U	--	<400 U	--	--	--	--	--	--	--	--	--
N-BUTYLBENZENE	104-51-8	ID	1,600	2E+09	2,500,000	4,600	8.8E+08	8,000,000	<69 U	--	<74 U	--	<69 UJ	--	<72 U	--	<110 U	--	<80 U	--	--	--	--	--	--	--	--	--
N-PROPYLBENZENE	103-65-1	ID	1,600 (I)	1.3E+09 (I)	2,500,000 (I)	4,600 (I)	5.9E+08 (I)	8,000,000 (I)	<69 U	--	<74 U	--	<69 UJ	--	<72 U	--	<110 U	--	<80 U	--	--	--	--	--	--	--	--	--
O-XYLENE	95-47-6	NA	NA	NA	NA	NA	NA	NA	<69 U	--	**190**	--	<69 UJ	--	**98**	--	**220**	--	<80 U	--	--	--	--	--	--	--	--	--
P-ISOPROPYL TOLUENE (p-CYMENE)	99-87-6	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SEC-BUTYLBENZENE	135-98-8	ID	1,600	4.00E+08	2.50E+06	1,600	1.80E+08	8.00E+06	<69 U	--	<74 U	--	<69 UJ	--	<72 U	--	<110 U	--	<80 U	--	--	--	--	--	--	--	--	--
TOLUENE	108-88-3	5,400 (I)	16,000 (I)	2.7E+10 (I)	5E+07 (C,I)	16,000 (I)	1.2E+10 (I)	1.6E+08 (C,I)	<69 U	--	**96**	--	<69 UJ	--	**120**	--	**240**	--	<80 U	--	--	--	--	--	--	--	--	--
XYLENE - TOTAL	1330-20-7	820 (I)	5,600 (I)	2.9E+11 (I)	4.1E+08 (C,I)	5600 (I)	1.3E+11 (I)	1E+09 (I)	ND	--	**370**	--	ND	--	**238**	--	**530**	--	ND	--	--	--	--	--	--	--	--	--
Organics - Pesticides (ug/kg)																														
4,4'-DDD	72-54-8	NLL	NLL	4.40E+07	95,000	NLL	5.60E+07	4.00E+05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4,4'-DDE	72-55-9	NLL	NLL	3.20E+07	45,000	NLL	4.00E+07	1.90E+05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4,4'-DDT	50-29-3	NLL	NLL	3.20E+07	57,000	NLL	4.00E+07	2.80E+05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ALDRIN	309-00-2	NLL	NLL	6.40E+05	1,000	NLL	8.00E+05	4,300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ALPHA-BHC	319-84-6	ID	18	1.70E+06	2,600	71	2.10E+06	12,000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ALPHA-CHLORODANE	5103-71-9	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BETA-BHC	319-85-7	ID	37	5.90E+06	5,400	150	7.40E+06	25,000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DIELDRIN	60-57-1	NLL	NLL	6.80E+05	1,100	NLL	8.50E+05	4,700	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ENDOSULFAN I	959-98-8	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ENDOSULFAN II	33213-65-9	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ENDOSULFAN SULFATE	1031-07-8	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ENDRIN	72-20-8	NLL	NLL	ID	65,000	NLL	ID	1.90E+05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ENDRIN ALDEHYDE	7421-93-4	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ENDRIN KETONE	53494-70-5	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GAMMA-CHLORDANE	5103-74-2	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HEPTACHLOR EPOXIDE	102-457-3	NLL	NLL	1.20E+06	3,100	NLL	1.50E+06	9,500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
METHOXYCHLOR	72-43-5	NA	16,000	ID	1.90E+06	16,000	ID	5.60E+06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Asbestos (%)																														
ASBESTOS	ASB	NLL	NLL	1% (1.0E+7 (M); 68,000 ppb)	ID	NLL	1% (1.0E+7 (M); 85,000 ppb)	ID	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	--

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

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Parameter	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria
Inorganics - Metals (mg/kg)								
ALUMINUM	7429-90-5	NA	6,900 (B)	ID	50,000 (DD)	6,900 (B)	ID	370,000 (DD)
ANTIMONY	7440-36-0	1.2 (X)	4.3	13,000	180	4.3	5,900	670
ARSENIC	7440-38-2	4.6	4.6	720	7.6	4.6	910	37
BARIUM	7440-39-3	130	1,300 (G)	330,000	37,000	1,300	150,000	130,000
BERYLLIUM	7440-41-7	4.6 (G)	51	1,300	410	51	590	1,600
CADMIUM	7440-43-9	1.6 (G,X)	6.0	1,700	550	6.0	2,200	2,100
CALCIUM	7440-70-2	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	7440-47-3	1,200,000 (G,H,X)	1,000,000 (D,H)	330,000 (H)	790,000 (H)	1,000,000 (D,H)	150,000 (H)	1,000,000 (D,H)
COBALT	7440-48-4	2.0	0.8	13,000	2,600	2.0	5,900	9,000
COPPER	7440-50-8	32 (G)	5,800	130,000	20,000	5,800	59,000	73,000
IRON	7439-89-6	NA	12,000 (B)	ID	160,000	12,000 (B)	ID	580,000
LEAD	7439-92-1	1,900 (G,X)	700	100,000	400	700	44,000	900 (DD)
LITHIUM	7439-93-2	9.8 (B)	9.8 (B)	2,300,000	4,200 (DD)	9.8 (B)	1,000,000	31,000 (DD)
MAGNESIUM	7439-95-4	NA	8,000	6,700,000	1,000,000 (D)	22,000	2,900,000	1,000,000 (D)
MANGANESE	7439-96-5	440 (B,G,X)	440 (B)	3,300	25,000	440 (B)	1,500	90,000
MERCURY	7439-97-6	0.13 (B, Z)	1.7 (Z)	20000 (Z)	160 (Z)	1.7 (Z)	8800 (Z)	580 (Z)
NICKEL	7440-02-0	29 (G)	100	13,000	40,000	100	16,000	150,000
POTASSIUM	7440-09-7	NA	NA	NA	NA	NA	NA	NA
SELENIUM	7782-49-2	0.41 (B)	4.0	130,000	2,600	4.0	59,000	9,600
SILVER	7440-22-4	1.0 (M); 0.027	4.5	6,700	2,500	13	2,900	9,000
SODIUM	7440-23-5	NA	NA	NA	NA	NA	NA	NA
THALLIUM	7440-28-0	1.4	2.3	13,000	35	2.3	5,900	130
VANADIUM	7440-62-2	430	72	ID	750 (DD)	990	ID	5,500 (DD)
ZINC	7440-66-6	62 (G)	2,400	ID	170,000	5,000	ID	630,000
Inorganics - Cyanide (mg/kg)								
CYANIDE	57-12-5	0.1 (P,R)	4.0 (P,R)	250 (P,R)	12 (P,R)	4.0 (P,R)	250 (P,R)	250 (P,R)
Organics - PCBs (ug/kg)								
AROCLOR-1260	11096-82-5	NA	NA	NA	NA	NA	NA	NA
AROCLOR-1262	37324-23-5	NA	NA	NA	NA	NA	NA	NA
TOTAL PCBS	TPCB	NLL	NLL	5,200,000 (J)	1,000 (J,T)	NLL	6,500,000 (J)	1,000 (J,T)

Geographic Location	QUINCY STAMP MILLS AREA																			
Station Name	QMCM-SS05		QMCM-SS06		QMCM-SS07		QMCM-SS08		QMCM-SS09		QMCM-SS10				QMCM-SS11		QMCM-SS12		QMCM-SS13	
Field Sample ID	QMCM-SS05-0"-6"		QMCM-SS06-0"-6"		QMCM-SS07-0"-6"		QMCM-SS08-0"-6"		QMCM-SS09-0"-6"		QMCM-SS10-0"-6"		QMCM-SS10-0"-6"-DUP		QMCM-SS11-0"-6"		QMCM-SS12-0"-6"		QMCM-SS13-0"-6"	
Sample Date	05/16/17		05/16/17		05/16/17		05/16/17		05/16/17		05/16/17		05/16/17		05/16/17		05/16/17		05/16/17	
Sample Interval (bgs)	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		0 - 0.5 ft		0 - 0.5 ft	
Sample Description	Dark brown SAND fine to medium grained with some organics		Brown SAND with trace silt; moist		Dark brown SAND, fine to medium with trace gravel; moist		Brown silty fine SAND; moist		Dark brown and black SAND with trace silt; moist		Dark brown and black SAND with organics; moist		Field Duplicate		Brown SAND fine grained; dry		Reddish-brown silty SAND; moist		Gray gravelly SAND; dry	
	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	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ANTIMONY	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ARSENIC	**2.9**	–	**1.2**	–	**4.1**	–	<0.5 U	–	**1**	–	**5.2**	[2,4,11]	**4.6**	–	**1.2**	–	**1**	–	<0.5 U	–
BARIUM	**62**	–	**22**	–	**100**	–	**18**	–	**21**	–	**120**	–	**120**	–	**13**	–	**42**	–	**8**	–
BERYLLIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CADMIUM	**1.1**	–	<0.2 U	–	**1.2**	–	<0.2 U	–	<0.2 U	–	**0.5**	–	**0.5**	–	<0.2 U	–	<0.2 U	–	**0.2**	–
CALCIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CHROMIUM	**36**	–	**7.5**	–	**38**	–	**7.1**	–	**12**	–	**15**	–	**15**	–	**6.7**	–	**18**	–	**28**	–
COBALT	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
COPPER	**1,100**	[2]	**43**	[2]	**1,900**	[2]	**15**	–	**27**	–	**280**	[2]	**250**	[2]	**53**	[2]	**81**	[2]	**670**	[2]
IRON	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
LEAD	**160**	–	**14**	–	**190**	–	**4.5**	–	**4.4**	–	**920**	[4,10,11,17]	**850**	[4,10,11]	**4.2**	–	**7.5**	–	**8.3**	–
LITHIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MAGNESIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MANGANESE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MERCURY	**0.3**	[2]	<0.07 U	–	**0.2**	[2]	<0.06 U	–	<0.06 U	–	**0.1**	–	**0.1**	–	<0.06 U	–	<0.07 U	–	**1.1**	[2]
NICKEL	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
POTASSIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SELENIUM	<0.2 U	–	<0.2 U	–	<0.2 U	–	<0.2 U	–	**0.3**	–	**0.8**	[2]	**0.7**	[2]	<0.2 U	–	**0.3**	–	<0.2 U	–
SILVER	**1.2**	[2]	**0.2**	–	**1.8**	[2]	<0.1 U	–	<0.1 U	–	**0.3**	–	**0.3**	–	<0.1 U	–	**0.2**	–	**1.1**	[2]
SODIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
THALLIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
VANADIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ZINC	**330**	[2]	**25**	–	**430**	[2]	**18**	–	**26**	–	**61**	–	**61**	–	**16**	–	**45**	–	**140**	[2]
Inorganics - Cyanide (mg/kg)																				
CYANIDE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Organics - PCBs (ug/kg)																				
AROCLOR-1260	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AROCLOR-1262	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TOTAL PCBS	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria
Station Name								
Field Sample ID								
Sample Date								
Sample Interval (bgs)								
Sample Description								
Organics - SVOCs (ug/kg)								
1,1'-BIPHENYL	92-52-4	NA	NA	NA	NA	NA	NA	NA
2-METHYLNAPHTHALENE (SVOC)	91-57-6S	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07
ACENAPHTHENE	83-32-9	8,700	300,000	1.4E+10	4.1E+07	880,000	6.2E+09	1.3E+08
ACENAPHTHYLENE	208-96-8	ID	5,900	2.3E+09	1,600,000	17,000	1E+09	5,200,000
ACETOPHENONE	98-86-2	ID	30,000	3.3E+10	4.7E+07 (C)	88,000	1.4E+10	1.5E+08 (C)
ANTHRACENE	120-12-7	ID	41,000	6.7E+10	2.3E+08	41,000	2.9E+10	7.3E+08
BENZO(A)ANTHRACENE	56-55-3	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)
BENZO(A)PYRENE	50-32-8	NLL	NLL	1,500,000 (Q)	2,000 (Q)	NLL	1,900,000 (Q)	8,000 (Q)
BENZO(B)FLUORANTHENE	205-99-2	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)
BENZO(G,H,I)PERYLENE	191-24-2	NLL	NLL	8E+08 (Q)	2,500,000 (Q)	NLL	3.5E+08 (Q)	7,000,000 (Q)
BENZO(K)FLUORANTHENE	207-08-9	NLL	NLL	ID	200,000 (Q)	NLL	ID	800,000 (Q)
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	NLL	NLL	7E+08	2,800,000	NLL	8.9E+08	1.2E+07 (C)
CARBAZOLE	86-74-8	1,100	9,400	6.2E+07	530,000	39,000	7.8E+07	2,400,000
CHRYSENE	218-01-9	NLL	NLL	ID	2,000,000 (Q)	NLL	ID	8,000,000 (Q)
DIBENZO(A,H)ANTHRACENE	53-70-3	NLL	NLL	ID	2,000 (Q)	NLL	ID	8,000 (Q)
DIBENZOFURAN	132-64-9	1,700	ID	6,700,000	ID	ID	2,900,000	ID
DI-N-BUTYLPHTHALATE	84-74-2	11000	960,000	3.30E+09	2.70E+07	2.7E+6 (C)	1.50E+09	8.7E+7 (C)
FLUORANTHENE	206-44-0	5,500	730,000	9.3E+09	4.6E+07	730,000	4.1E+09	1.3E+08
FLUORENE	86-73-7	5,300	390,000	9.3E+09	2.7E+07	890,000	4.1E+09	8.7E+07
INDENO(1,2,3-CD)PYRENE	193-39-5	NLL	NLL	ID	20,000	NLL	ID	80,000
NAPHTHALENE (SVOC)	91-20-3S	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07
PHENANTHRENE	85-01-8	2,100	56,000	6,700,000	1,600,000	160,000	2,900,000	5,200,000
PYRENE	129-00-0	ID	480,000	6.7E+09	2.9E+07	480,000	2.9E+09	8.4E+07
Organics - VOCs (ug/kg)								
1,2,3-TRIMETHYLBENZENE	526-73-8	NA	NA	NA	NA	NA	NA	NA
1,2,4-TRIMETHYLBENZENE	95-63-6	570 (I)	2,100 (I)	8.2E+10 (I)	3.2E+07 (C,I)	2,100 (I)	3.6E+10 (I)	1E+08 (C,I)
1,3,5-TRIMETHYLBENZENE	108-67-8	1,100 (I)	1,800 (I)	8.2E+10 (I)	3.2E+07 (C,I)	1,800 (I)	3.6E+10 (I)	1E+08 (C,I)
2-METHYLNAPHTHALENE (VOC)	91-57-6V	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07
BENZENE	71-43-2	240 (I,X)	100 (I)	3.8E+08 (I)	180,000 (I)	100 (I)	4.7E+08 (I)	840,000 (C,I)
CYCLOHEXANE	110-82-7	NA	NA	NA	NA	NA	NA	NA
ETHYLBENZENE	100-41-4	360 (I)	1,500 (I)	1E+10 (I)	2.2E+07 (C,I)	1,500 (I)	1.3E+10 (I)	7.1E+07 (C, I)
HEXANE	110-54-3	NA	1.8E+05 (C)	1.30E+10	9.2E+07 (C)	5.1E+5 (C)	5.90E+09	3.0E+8 (C)

Geographic Location	QUINCY STAMP MILLS AREA																			
Station Name	QMCM-SS05		QMCM-SS06		QMCM-SS07		QMCM-SS08		QMCM-SS09		QMCM-SS10				QMCM-SS11		QMCM-SS12		QMCM-SS13	
Field Sample ID	QMCM-SS05-0"-6"		QMCM-SS06-0"-6"		QMCM-SS07-0"-6"		QMCM-SS08-0"-6"		QMCM-SS09-0"-6"		QMCM-SS10-0"-6"		QMCM-SS10-0"-6"-DUP		QMCM-SS11-0"-6"		QMCM-SS12-0"-6"		QMCM-SS13-0"-6"	
Sample Date	05/16/17		05/16/17		05/16/17		05/16/17		05/16/17		05/16/17		05/16/17		05/16/17		05/16/17		05/16/17	
Sample Interval (bgs)	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		0 - 0.5 ft		0 - 0.5 ft	
Sample Description	Dark brown SAND fine to medium grained with some organics		Brown SAND with trace silt; moist		Dark brown SAND, fine to medium with trace gravel; moist		Brown silty fine SAND; moist		Dark brown and black SAND with trace silt; moist		Dark brown and black SAND with organics; moist		Field Duplicate		Brown SAND fine grained; dry		Reddish-brown silty SAND; moist		Gray gravelly SAND; dry	
	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Organics - SVOCs (ug/kg)																				
1,1'-BIPHENYL	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2-METHYLNAPHTHALENE (SVOC)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ACENAPHTHENE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ACENAPHTHYLENE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ACETOPHENONE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ANTHRACENE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BENZO(A)ANTHRACENE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BENZO(A)PYRENE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BENZO(B)FLUORANTHENE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BENZO(G,H,I)PERYLENE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BENZO(K)FLUORANTHENE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BIS(2-ETHYLHEXYL)PHTHALATE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CARBAZOLE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CHRYSENE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DIBENZO(A,H)ANTHRACENE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DIBENZOFURAN	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DI-N-BUTYLPHTHALATE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
FLUORANTHENE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
FLUORENE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
INDENO(1,2,3-CD)PYRENE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
NAPHTHALENE (SVOC)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PHENANTHRENE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PYRENE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Organics - VOCs (ug/kg)																				
1,2,3-TRIMETHYLBENZENE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1,2,4-TRIMETHYLBENZENE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1,3,5-TRIMETHYLBENZENE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2-METHYLNAPHTHALENE (VOC)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BENZENE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CYCLOHEXANE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ETHYLBENZENE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
HEXANE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY STAMP MILLS AREA																			
Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	QMCM-SS05		QMCM-SS06		QMCM-SS07		QMCM-SS08		QMCM-SS09		QMCM-SS10				QMCM-SS11		QMCM-SS12		QMCM-SS13	
Field Sample ID									QMCM-SS05-0"-6"		QMCM-SS06-0"-6"		QMCM-SS07-0"-6"		QMCM-SS08-0"-6"		QMCM-SS09-0"-6"		QMCM-SS10-0"-6"		QMCM-SS10-0"-6"-DUP		QMCM-SS11-0"-6"		QMCM-SS12-0"-6"		QMCM-SS13-0"-6"	
Sample Date									05/16/17		05/16/17		05/16/17		05/16/17		05/16/17		05/16/17		05/16/17		05/16/17		05/16/17		05/16/17	
Sample Interval (bgs)									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		0 - 0.5 ft		0 - 0.5 ft	
Sample Description									Dark brown SAND fine to medium grained with some organics		Brown SAND with trace silt; moist		Dark brown SAND, fine to medium with trace gravel; moist		Brown silty fine SAND; moist		Dark brown and black SAND with trace silt; moist		Dark brown and black SAND with organics; moist		Field Duplicate		Brown SAND fine grained; dry		Reddish-brown silty SAND; moist		Gray gravelly SAND; dry	
									Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Organics - VOCs (ug/kg) (continued)																												
ISOPROPYLBENZENE	98-82-8	3,200	91,000	5.8E+09	2.5E+07 (C)	260,000	2.6E+09	8E+07 (C)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M,P-XYLENE	1330-20-7	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
METHYLENE CHLORIDE	75-09-2	30,000 (X)	100	6.60E+09	1.30E+06	100	8.30E+09	5.8E+6 (C)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NAPHTHALENE (VOC)	91-20-3V	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
N-BUTYLBENZENE	104-51-8	ID	1,600	2E+09	2,500,000	4,600	8.8E+08	8,000,000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
N-PROPYLBENZENE	103-65-1	ID	1,600 (I)	1.3E+09 (I)	2,500,000 (I)	4,600 (I)	5.9E+08 (I)	8,000,000 (I)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
O-XYLENE	95-47-6	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-ISOPROPYL TOLUENE (p-CYMENE)	99-87-6	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SEC-BUTYLBENZENE	135-98-8	ID	1,600	4.00E+08	2.50E+06	1,600	1.80E+08	8.00E+06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOLUENE	108-88-3	5,400 (I)	16,000 (I)	2.7E+10 (I)	5E+07 (C,I)	16,000 (I)	1.2E+10 (I)	1.6E+08 (C,I)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
XYLENE - TOTAL	1330-20-7	820 (I)	5,600 (I)	2.9E+11 (I)	4.1E+08 (C,I)	5600 (I)	1.3E+11 (I)	1E+09 (I)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Organics - Pesticides (ug/kg)																												
4,4'-DDD	72-54-8	NLL	NLL	4.40E+07	95,000	NLL	5.60E+07	4.00E+05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4,4'-DDE	72-55-9	NLL	NLL	3.20E+07	45,000	NLL	4.00E+07	1.90E+05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4,4'-DDT	50-29-3	NLL	NLL	3.20E+07	57,000	NLL	4.00E+07	2.80E+05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ALDRIN	309-00-2	NLL	NLL	6.40E+05	1,000	NLL	8.00E+05	4,300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ALPHA-BHC	319-84-6	ID	18	1.70E+06	2,600	71	2.10E+06	12,000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ALPHA-CHLORODANE	5103-71-9	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BETA-BHC	319-85-7	ID	37	5.90E+06	5,400	150	7.40E+06	25,000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DIELDRIN	60-57-1	NLL	NLL	6.80E+05	1,100	NLL	8.50E+05	4,700	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ENDOSULFAN I	959-98-8	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ENDOSULFAN II	33213-65-9	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ENDOSULFAN SULFATE	1031-07-8	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ENDRIN	72-20-8	NLL	NLL	ID	65,000	NLL	ID	1.90E+05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ENDRIN ALDEHYDE	7421-93-4	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ENDRIN KETONE	53494-70-5	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GAMMA-CHLORDANE	5103-74-2	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HEPTACHLOR EPOXIDE	102-457-3	NLL	NLL	1.20E+06	3,100	NLL	1.50E+06	9,500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
METHOXYCHLOR	72-43-5	NA	16,000	ID	1.90E+06	16,000	ID	5.60E+06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Asbestos (%)																												
ASBESTOS	ASB	NLL	NLL	1% (1.0E+7 (M); 68,000 ppb)	ID	NLL	1% (1.0E+7 (M); 85,000 ppb)	ID	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

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

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location / Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria
Inorganics - Metals (mg/kg)								
ALUMINUM	7429-90-5	NA	6,900 (B)	ID	50,000 (DD)	6,900 (B)	ID	370,000 (DD)
ANTIMONY	7440-36-0	1.2 (X)	4.3	13,000	180	4.3	5,900	670
ARSENIC	7440-38-2	4.6	4.6	720	7.6	4.6	910	37
BARIUM	7440-39-3	130	1,300 (G)	330,000	37,000	1,300	150,000	130,000
BERYLLIUM	7440-41-7	4.6 (G)	51	1,300	410	51	590	1,600
CADMIUM	7440-43-9	1.6 (G,X)	6.0	1,700	550	6.0	2,200	2,100
CALCIUM	7440-70-2	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	7440-47-3	1,200,000 (G,H,X)	1,000,000 (D,H)	330,000 (H)	790,000 (H)	1,000,000 (D,H)	150,000 (H)	1,000,000 (D,H)
COBALT	7440-48-4	2.0	0.8	13,000	2,600	2.0	5,900	9,000
COPPER	7440-50-8	32 (G)	5,800	130,000	20,000	5,800	59,000	73,000
IRON	7439-89-6	NA	12,000 (B)	ID	160,000	12,000 (B)	ID	580,000
LEAD	7439-92-1	1,900 (G,X)	700	100,000	400	700	44,000	900 (DD)
LITHIUM	7439-93-2	9.8 (B)	9.8 (B)	2,300,000	4,200 (DD)	9.8 (B)	1,000,000	31,000 (DD)
MAGNESIUM	7439-95-4	NA	8,000	6,700,000	1,000,000 (D)	22,000	2,900,000	1,000,000 (D)
MANGANESE	7439-96-5	440 (B,G,X)	440 (B)	3,300	25,000	440 (B)	1,500	90,000
MERCURY	7439-97-6	0.13 (B, Z)	1.7 (Z)	20000 (Z)	160 (Z)	1.7 (Z)	8800 (Z)	580 (Z)
NICKEL	7440-02-0	29 (G)	100	13,000	40,000	100	16,000	150,000
POTASSIUM	7440-09-7	NA	NA	NA	NA	NA	NA	NA
SELENIUM	7782-49-2	0.41 (B)	4.0	130,000	2,600	4.0	59,000	9,600
SILVER	7440-22-4	1.0 (M); 0.027	4.5	6,700	2,500	13	2,900	9,000
SODIUM	7440-23-5	NA	NA	NA	NA	NA	NA	NA
THALLIUM	7440-28-0	1.4	2.3	13,000	35	2.3	5,900	130
VANADIUM	7440-62-2	430	72	ID	750 (DD)	990	ID	5,500 (DD)
ZINC	7440-66-6	62 (G)	2,400	ID	170,000	5,000	ID	630,000
Inorganics - Cyanide (mg/kg)								
CYANIDE	57-12-5	0.1 (P,R)	4.0 (P,R)	250 (P,R)	12 (P,R)	4.0 (P,R)	250 (P,R)	250 (P,R)
Organics - PCBs (ug/kg)								
AROCLOR-1260	11096-82-5	NA	NA	NA	NA	NA	NA	NA
AROCLOR-1262	37324-23-5	NA	NA	NA	NA	NA	NA	NA
TOTAL PCBS	TPCB	NLL	NLL	5,200,000 (J)	1,000 (J,T)	NLL	6,500,000 (J)	1,000 (J,T)

Geographic Location	QUINCY STAMP MILLS AREA																			
Station Name	QMCM-SS14		QMCM-SS15		QMCM-SS16		QMCM-SS17		QMCM-SS18		QMCM-SS19		QMCM-SS20				QMCM-SS21		QMCM-SS22	
Field Sample ID	QMCM-SS14-0"-6"		QMCM-SS15-0"-6"		QMCM-SS16-0"-6"		QMCM-SS17-0"-6"		QMCM-SS18-0"-6"		QMCM-SS19-0"-6"		QMCM-SS20-0"-6"		QMCM-SS20-0"-6"-DUP		QMCM-SS21-0"-6"		QMCM-SS22-0"-6"	
Sample Date	05/16/17		05/16/17		05/16/17		05/16/17		05/16/17		05/16/17		05/16/17		05/16/17		05/16/17		05/16/17	
Sample Interval (bgs)	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		0 - 0.5 ft		0 - 0.5 ft	
Sample Description	Gray gravelly SAND; dry		Yellowish fine SAND with trace gravel; dry		Dark brown, fine SAND; moist with organics		Dark brown, fine SAND		Brown fine SAND; moist with organics		Brown, gravelly SAND fine to medium SAND; dry		Dark brown gravelly fine to medium SAND; dry		Field Duplicate		Brown SAND, fine to medium grained; moist with organics		Brown to red, silty SAND fine grained with debris	
	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	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ANTIMONY	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ARSENIC	1.3	–	14	[2,4,10,11]	2.7	–	4	–	1.5	–	5.2	[2,4,11]	5.3	[2,4,11]	3.5	–	1.7	–	2.1	–
BARIUM	6.8	–	39	–	23	–	25	–	20	–	13	–	97	–	40	–	22	–	17	–
BERYLLIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CADMIUM	0.2	–	0.5	–	<0.2 U	–	0.6	–	<0.2 U	–	0.3	–	0.6	–	0.6	–	<0.2 U	–	0.4	–
CALCIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CHROMIUM	25	–	5.7	–	7.9	–	21	–	9.8	–	34	–	31	–	28	–	14	–	14	–
COBALT	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
COPPER	2,200	[2]	260	[2]	160	[2]	23,000	[2,4,10,11]	160	[2]	45,000	[2,4,10,11]	59,000	[2,4,10,11]	21,000	[2,4,10,11]	970	[2]	9,200	[2,4,11]
IRON	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
LEAD	11	–	98	–	18	–	130	–	16	–	130	–	280	–	220	–	21	–	76	–
LITHIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MAGNESIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MANGANESE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MERCURY	0.5	[2]	0.1	–	0.09	–	0.8	[2]	<0.06 U	–	0.6	[2]	0.5	[2]	0.3	[2]	0.07	–	0.2	[2]
NICKEL	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
POTASSIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SELENIUM	<0.2 U	–	<0.2 U	–	<0.2 U	–	<0.2 U	–	<0.2 U	–	<0.2 U	–	4.9	[2,4,11]	<0.2 U	–	<0.2 U	–	<0.2 U	–
SILVER	1.2	[2]	0.2	–	0.2	–	18	[2,4,11]	0.3	–	28	[2,4,11]	36	[2,4,11]	30	[2,4,11]	0.6	–	3.9	[2]
SODIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
THALLIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
VANADIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ZINC	130	[2]	210	[2]	25	–	130	[2]	25	–	170	[2]	460	[2]	290	[2]	41	–	150	[2]
Inorganics - Cyanide (mg/kg)																				
CYANIDE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Organics - PCBs (ug/kg)																				
AROCLOR-1260	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AROCLOR-1262	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TOTAL PCBS	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY STAMP MILLS AREA																			
Station Name	CAS Number								QMCM-SS14		QMCM-SS15		QMCM-SS16		QMCM-SS17		QMCM-SS18		QMCM-SS19		QMCM-SS20				QMCM-SS21		QMCM-SS22	
Field Sample ID		[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	QMCM-SS14-0"-6"		QMCM-SS15-0"-6"		QMCM-SS16-0"-6"		QMCM-SS17-0"-6"		QMCM-SS18-0"-6"		QMCM-SS19-0"-6"		QMCM-SS20-0"-6"		QMCM-SS20-0"-6"-DUP		QMCM-SS21-0"-6"		QMCM-SS22-0"-6"	
Sample Date									05/16/17		05/16/17		05/16/17		05/16/17		05/16/17		05/16/17		05/16/17		05/16/17		05/16/17		05/16/17	
Sample Interval (bgs)									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		0 - 0.5 ft		0 - 0.5 ft	
Sample Description									Gray gravelly SAND; dry		Yellowish fine SAND with trace gravel; dry		Dark brown, fine SAND; moist with organics		Dark brown, fine SAND		Brown fine SAND; moist with organics		Brown, gravelly SAND fine to medium SAND; dry		Dark brown gravelly fine to medium SAND; dry		Field Duplicate		Brown SAND, fine to medium grained; moist with organics		Brown to red, silty SAND fine grained with debris	
									Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Organics - SVOCs (ug/kg)																												
1,1'-BIPHENYL	92-52-4	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2-METHYLNAPHTHALENE (SVOC)	91-57-6S	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ACENAPHTHENE	83-32-9	8,700	300,000	1.4E+10	4.1E+07	880,000	6.2E+09	1.3E+08	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ACENAPHTHYLENE	208-96-8	ID	5,900	2.3E+09	1,600,000	17,000	1E+09	5,200,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ACETOPHENONE	98-86-2	ID	30,000	3.3E+10	4.7E+07 (C)	88,000	1.4E+10	1.5E+08 (C)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ANTHRACENE	120-12-7	ID	41,000	6.7E+10	2.3E+08	41,000	2.9E+10	7.3E+08	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BENZO(A)ANTHRACENE	56-55-3	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BENZO(A)PYRENE	50-32-8	NLL	NLL	1,500,000 (Q)	2,000 (Q)	NLL	1,900,000 (Q)	8,000 (Q)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BENZO(B)FLUORANTHENE	205-99-2	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BENZO(G,H,I)PERYLENE	191-24-2	NLL	NLL	8E+08 (Q)	2,500,000 (Q)	NLL	3.5E+08 (Q)	7,000,000 (Q)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BENZO(K)FLUORANTHENE	207-08-9	NLL	NLL	ID	200,000 (Q)	NLL	ID	800,000 (Q)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	NLL	NLL	7E+08	2,800,000	NLL	8.9E+08	1.2E+07 (C)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CARBAZOLE	86-74-8	1,100	9,400	6.2E+07	530,000	39,000	7.8E+07	2,400,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CHRYSENE	218-01-9	NLL	NLL	ID	2,000,000 (Q)	NLL	ID	8,000,000 (Q)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DIBENZO(A,H)ANTHRACENE	53-70-3	NLL	NLL	ID	2,000 (Q)	NLL	ID	8,000 (Q)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DIBENZOFURAN	132-64-9	1,700	ID	6,700,000	ID	ID	2,900,000	ID	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DI-N-BUTYLPHTHALATE	84-74-2	11000	960,000	3.30E+09	2.70E+07	2.7E+6 (C)	1.50E+09	8.7E+7 (C)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
FLUORANTHENE	206-44-0	5,500	730,000	9.3E+09	4.6E+07	730,000	4.1E+09	1.3E+08	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
FLUORENE	86-73-7	5,300	390,000	9.3E+09	2.7E+07	890,000	4.1E+09	8.7E+07	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
INDENO(1,2,3-CD)PYRENE	193-39-5	NLL	NLL	ID	20,000	NLL	ID	80,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
NAPHTHALENE (SVOC)	91-20-3S	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PHENANTHRENE	85-01-8	2,100	56,000	6,700,000	1,600,000	160,000	2,900,000	5,200,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PYRENE	129-00-0	ID	480,000	6.7E+09	2.9E+07	480,000	2.9E+09	8.4E+07	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Organics - VOCs (ug/kg)																												
1,2,3-TRIMETHYLBENZENE	526-73-8	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1,2,4-TRIMETHYLBENZENE	95-63-6	570 (I)	2,100 (I)	8.2E+10 (I)	3.2E+07 (C,I)	2,100 (I)	3.6E+10 (I)	1E+08 (C,I)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1,3,5-TRIMETHYLBENZENE	108-67-8	1,100 (I)	1,800 (I)	8.2E+10 (I)	3.2E+07 (C,I)	1,800 (I)	3.6E+10 (I)	1E+08 (C,I)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2-METHYLNAPHTHALENE (VOC)	91-57-6V	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BENZENE	71-43-2	240 (I,X)	100 (I)	3.8E+08 (I)	180,000 (I)	100 (I)	4.7E+08 (I)	840,000 (C,I)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CYCLOHEXANE	110-82-7	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ETHYLBENZENE	100-41-4	360 (I)	1,500 (I)	1E+10 (I)	2.2E+07 (C,I)	1,500 (I)	1.3E+10 (I)	7.1E+07 (C, I)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
HEXANE	110-54-3	NA	1.8E+05 (C)	1.30E+10	9.2E+07 (C)	5.1E+5 (C)	5.90E+09	3.0E+8 (C)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY STAMP MILLS AREA																			
Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	QMCM-SS14		QMCM-SS15		QMCM-SS16		QMCM-SS17		QMCM-SS18		QMCM-SS19		QMCM-SS20				QMCM-SS21		QMCM-SS22	
Field Sample ID									QMCM-SS14-0"-6"		QMCM-SS15-0"-6"		QMCM-SS16-0"-6"		QMCM-SS17-0"-6"		QMCM-SS18-0"-6"		QMCM-SS19-0"-6"		QMCM-SS20-0"-6"		QMCM-SS20-0"-6"-DUP		QMCM-SS21-0"-6"		QMCM-SS22-0"-6"	
Sample Date									05/16/17		05/16/17		05/16/17		05/16/17		05/16/17		05/16/17		05/16/17		05/16/17		05/16/17		05/16/17	
Sample Interval (bgs)									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		0 - 0.5 ft		0 - 0.5 ft	
Sample Description									Gray gravelly SAND; dry		Yellowish fine SAND with trace gravel; dry		Dark brown, fine SAND; moist with organics		Dark brown, fine SAND		Brown fine SAND; moist with organics		Brown, gravelly SAND fine to medium SAND; dry		Dark brown gravelly fine to medium SAND; dry		Field Duplicate		Brown SAND, fine to medium grained; moist with organics		Brown to red, silty SAND fine grained with debris	
									Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Organics - VOCs (ug/kg) (continued)																												
ISOPROPYLBENZENE	98-82-8	3,200	91,000	5.8E+09	2.5E+07 (C)	260,000	2.6E+09	8E+07 (C)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
M,P-XYLENE	1330-20-7	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
METHYLENE CHLORIDE	75-09-2	30,000 (X)	100	6.60E+09	1.30E+06	100	8.30E+09	5.8E+6 (C)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
NAPHTHALENE (VOC)	91-20-3V	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
N-BUTYLBENZENE	104-51-8	ID	1,600	2E+09	2,500,000	4,600	8.8E+08	8,000,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
N-PROPYLBENZENE	103-65-1	ID	1,600 (I)	1.3E+09 (I)	2,500,000 (I)	4,600 (I)	5.9E+08 (I)	8,000,000 (I)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
O-XYLENE	95-47-6	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
P-ISOPROPYL TOLUENE (p-CYMENE)	99-87-6	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SEC-BUTYLBENZENE	135-98-8	ID	1,600	4.00E+08	2.50E+06	1,600	1.80E+08	8.00E+06	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TOLUENE	108-88-3	5,400 (I)	16,000 (I)	2.7E+10 (I)	5E+07 (C,I)	16,000 (I)	1.2E+10 (I)	1.6E+08 (C,I)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
XYLENE - TOTAL	1330-20-7	820 (I)	5,600 (I)	2.9E+11 (I)	4.1E+08 (C,I)	5600 (I)	1.3E+11 (I)	1E+09 (I)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Organics - Pesticides (ug/kg)																												
4,4'-DDD	72-54-8	NLL	NLL	4.40E+07	95,000	NLL	5.60E+07	4.00E+05	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
4,4'-DDE	72-55-9	NLL	NLL	3.20E+07	45,000	NLL	4.00E+07	1.90E+05	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
4,4'-DDT	50-29-3	NLL	NLL	3.20E+07	57,000	NLL	4.00E+07	2.80E+05	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ALDRIN	309-00-2	NLL	NLL	6.40E+05	1,000	NLL	8.00E+05	4,300	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ALPHA-BHC	319-84-6	ID	18	1.70E+06	2,600	71	2.10E+06	12,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ALPHA-CHLORODANE	5103-71-9	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BETA-BHC	319-85-7	ID	37	5.90E+06	5,400	150	7.40E+06	25,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DIELDRIN	60-57-1	NLL	NLL	6.80E+05	1,100	NLL	8.50E+05	4,700	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDOSULFAN I	959-98-8	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDOSULFAN II	33213-65-9	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDOSULFAN SULFATE	1031-07-8	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDRIN	72-20-8	NLL	NLL	ID	65,000	NLL	ID	1.90E+05	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDRIN ALDEHYDE	7421-93-4	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDRIN KETONE	53494-70-5	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
GAMMA-CHLORDANE	5103-74-2	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
HEPTACHLOR EPOXIDE	102-457-3	NLL	NLL	1.20E+06	3,100	NLL	1.50E+06	9,500	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
METHOXYCHLOR	72-43-5	NA	16,000	ID	1.90E+06	16,000	ID	5.60E+06	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Asbestos (%)																												
ASBESTOS	ASB	NLL	NLL	1% (1.0E+7 (M); 68,000 ppb)	ID	NLL	1% (1.0E+7 (M); 85,000 ppb)	ID	–	–	–	–	–	–	ND	–	ND	–	–	–	–	–	–	–	ND	–	–	–

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

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location								
Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria
Field Sample ID								
Sample Date								
Sample Interval (bgs)								
Sample Description								
Inorganics - Metals (mg/kg)								
ALUMINUM	7429-90-5	NA	6,900 (B)	ID	50,000 (DD)	6,900 (B)	ID	370,000 (DD)
ANTIMONY	7440-36-0	1.2 (X)	4.3	13,000	180	4.3	5,900	670
ARSENIC	7440-38-2	4.6	4.6	720	7.6	4.6	910	37
BARIUM	7440-39-3	130	1,300 (G)	330,000	37,000	1,300	150,000	130,000
BERYLLIUM	7440-41-7	4.6 (G)	51	1,300	410	51	590	1,600
CADMIUM	7440-43-9	1.6 (G,X)	6.0	1,700	550	6.0	2,200	2,100
CALCIUM	7440-70-2	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	7440-47-3	1,200,000 (G,H,X)	1,000,000 (D,H)	330,000 (H)	790,000 (H)	1,000,000 (D,H)	150,000 (H)	1,000,000 (D,H)
COBALT	7440-48-4	2.0	0.8	13,000	2,600	2.0	5,900	9,000
COPPER	7440-50-8	32 (G)	5,800	130,000	20,000	5,800	59,000	73,000
IRON	7439-89-6	NA	12,000 (B)	ID	160,000	12,000 (B)	ID	580,000
LEAD	7439-92-1	1,900 (G,X)	700	100,000	400	700	44,000	900 (DD)
LITHIUM	7439-93-2	9.8 (B)	9.8 (B)	2,300,000	4,200 (DD)	9.8 (B)	1,000,000	31,000 (DD)
MAGNESIUM	7439-95-4	NA	8,000	6,700,000	1,000,000 (D)	22,000	2,900,000	1,000,000 (D)
MANGANESE	7439-96-5	440 (B,G,X)	440 (B)	3,300	25,000	440 (B)	1,500	90,000
MERCURY	7439-97-6	0.13 (B, Z)	1.7 (Z)	20000 (Z)	160 (Z)	1.7 (Z)	8800 (Z)	580 (Z)
NICKEL	7440-02-0	29 (G)	100	13,000	40,000	100	16,000	150,000
POTASSIUM	7440-09-7	NA	NA	NA	NA	NA	NA	NA
SELENIUM	7782-49-2	0.41 (B)	4.0	130,000	2,600	4.0	59,000	9,600
SILVER	7440-22-4	1.0 (M); 0.027	4.5	6,700	2,500	13	2,900	9,000
SODIUM	7440-23-5	NA	NA	NA	NA	NA	NA	NA
THALLIUM	7440-28-0	1.4	2.3	13,000	35	2.3	5,900	130
VANADIUM	7440-62-2	430	72	ID	750 (DD)	990	ID	5,500 (DD)
ZINC	7440-66-6	62 (G)	2,400	ID	170,000	5,000	ID	630,000
Inorganics - Cyanide (mg/kg)								
CYANIDE	57-12-5	0.1 (P,R)	4.0 (P,R)	250 (P,R)	12 (P,R)	4.0 (P,R)	250 (P,R)	250 (P,R)
Organics - PCBs (ug/kg)								
AROCLOR-1260	11096-82-5	NA	NA	NA	NA	NA	NA	NA
AROCLOR-1262	37324-23-5	NA	NA	NA	NA	NA	NA	NA
TOTAL PCBS	TPCB	NLL	NLL	5,200,000 (J)	1,000 (J,T)	NLL	6,500,000 (J)	1,000 (J,T)

Geographic Location	QUINCY STAMP MILLS AREA									
Station Name	QMCM-SS23		QMCM-SS24		QMCM-SS25		QMCM-SS26		QMCM-SS27	
Field Sample ID	QMCM-SS23-0"-6"		QMCM-SS24-0"-6"		QMCM-SS25-0"-6"		QMCM-SS26-0"-6"		QMCM-SS27-0"-6"	
Sample Date	05/16/17		05/16/17		05/17/17		05/17/17		05/17/17	
Sample Interval (bgs)	0 - 0.5 ft		0 - 0.5 ft		0 - 0.5 ft		0 - 0.5 ft		0 - 0.5 ft	
Sample Description	Brown to red SAND		Brown fine to medium SAND with some gravel; moist		Dark brown fine to medium SAND with some gravel; moist		Dark brown fine to coarse SAND with some gravel; moist		Dark brown fine to coarse SAND with some gravel; moist	
	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Inorganics - Metals (mg/kg)										
ALUMINUM	–	–	–	–	–	–	–	–	–	–
ANTIMONY	–	–	–	–	–	–	–	–	–	–
ARSENIC	8.4	[2,4,10,11]	2.3	–	29	[2,4,10,11]	13	[2,4,10,11]	32	[2,4,10,11]
BARIUM	12	–	17	–	44	–	31	–	57	–
BERYLLIUM	–	–	–	–	–	–	–	–	–	–
CADMIUM	<0.2 U	–	<0.2 U	–	<0.2 U	–	0.3	–	<0.2 U	–
CALCIUM	–	–	–	–	–	–	–	–	–	–
CHROMIUM	14	–	11	–	12	–	17	–	10	–
COBALT	–	–	–	–	–	–	–	–	–	–
COPPER	900	[2]	990	[2]	560	[2]	1,700	[2]	310	[2]
IRON	–	–	–	–	–	–	–	–	–	–
LEAD	25	–	10	–	12	–	51	–	48	–
LITHIUM	–	–	–	–	–	–	–	–	–	–
MAGNESIUM	–	–	–	–	–	–	–	–	–	–
MANGANESE	–	–	–	–	–	–	–	–	–	–
MERCURY	0.05	–	<0.06 U	–	0.08	–	0.1	–	0.08	–
NICKEL	–	–	–	–	–	–	–	–	–	–
POTASSIUM	–	–	–	–	–	–	–	–	–	–
SELENIUM	<0.2 U	–	<0.2 U	–	2.8	[2]	0.3	–	1.7	[2]
SILVER	0.9	–	0.7	–	1.8	[2]	1.4	[2]	0.3	–
SODIUM	–	–	–	–	–	–	–	–	–	–
THALLIUM	–	–	–	–	–	–	–	–	–	–
VANADIUM	–	–	–	–	–	–	–	–	–	–
ZINC	39	–	20	–	39	–	72	[2]	35	–
Inorganics - Cyanide (mg/kg)										
CYANIDE	–	–	–	–	–	–	–	–	–	–
Organics - PCBs (ug/kg)										
AROCLOR-1260	–	–	–	–	–	–	–	–	–	–
AROCLOR-1262	–	–	–	–	–	–	–	–	–	–
TOTAL PCBS	–	–	–	–	–	–	–	–	–	–

Geographic Location	QUINCY STAMP MILLS AREA									
Station Name	QMCM-SS28		QMCM-SS29		QMCM-SS30		QMCM-SS31		QMCM-SS32	
Field Sample ID	QMCM-SS28-0"-6"		QMCM-SS29-0"-6"		QMCM-SS30-0"-6"		QMCM-SS31-0"-6"		QMCM-SS32-0"-6"	
Sample Date	05/17/17		05/17/17		05/17/17		05/17/17		05/17/17	
Sample Interval (bgs)	0 - 0.5 ft		0 - 0.5 ft		0 - 0.5 ft		0 - 0.5 ft		0 - 0.5 ft	
Sample Description	Dark brown to black medium to coarse grained SAND with some gravel; moist		Brown SAND; moist		Brown coarse SAND; moist		Gray to brown coarse SAND with some gravel; moist		Dark brown fine to medium grained SAND with some silt; moist	
	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Inorganics - Metals (mg/kg)										
ALUMINUM	–	–	–	–	–	–	–	–	–	–
ANTIMONY	–	–	–	–	–	–	–	–	–	–
ARSENIC	19	[2,4,10,11]	2.2	–	6.4	[2,4,11]	3	–	8.4	[2,4,10,11]
BARIUM	43	–	11	–	17	–	12	–	58	–
BERYLLIUM	–	–	–	–	–	–	–	–	–	–
CADMIUM	<0.2 U	–	<0.2 U	–	0.2	–	0.3	–	0.2	–
CALCIUM	–	–	–	–	–	–	–	–	–	–
CHROMIUM	7.7	–	11	–	16	–	33	–	14	–
COBALT	–	–	–	–	–	–	–	–	–	–
COPPER	67	[2]	580	[2]	1,500	[2]	1,900	[2]	220	[2]
IRON	–	–	–	–	–	–	–	–	–	–
LEAD	7.9	–	15	–	21	–	7.1	–	18	–
LITHIUM	–	–	–	–	–	–	–	–	–	–
MAGNESIUM	–	–	–	–	–	–	–	–	–	–
MANGANESE	–	–	–	–	–	–	–	–	–	–
MERCURY	<0.06 U	–	0.09	–	0.8	[2]	0.2	[2]	<0.07 U	–
NICKEL	–	–	–	–	–	–	–	–	–	–
POTASSIUM	–	–	–	–	–	–	–	–	–	–
SELENIUM	1.4	[2]	<0.2 U	–	<0.2 U	–	<0.2 U	–	0.5	[2]
SILVER	<0.1 U	–	0.5	–	1.1	[2]	15	[2,4,11]	0.2	–
SODIUM	–	–	–	–	–	–	–	–	–	–
THALLIUM	–	–	–	–	–	–	–	–	–	–
VANADIUM	–	–	–	–	–	–	–	–	–	–
ZINC	15	–	42	–	60	–	100	[2]	54	–
Inorganics - Cyanide (mg/kg)										
CYANIDE	–	–	–	–	–	–	–	–	–	–
Organics - PCBs (ug/kg)										
AROCLOR-1260	–	–	–	–	–	–	–	–	–	–
AROCLOR-1262	–	–	–	–	–	–	–	–	–	–
TOTAL PCBS	–	–	–	–	–	–	–	–	–	–

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria
Organics - SVOCs (ug/kg)								
1,1'-BIPHENYL	92-52-4	NA	NA	NA	NA	NA	NA	NA
2-METHYLNAPHTHALENE (SVOC)	91-57-6S	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07
ACENAPHTHENE	83-32-9	8,700	300,000	1.4E+10	4.1E+07	880,000	6.2E+09	1.3E+08
ACENAPHTHYLENE	208-96-8	ID	5,900	2.3E+09	1,600,000	17,000	1E+09	5,200,000
ACETOPHENONE	98-86-2	ID	30,000	3.3E+10	4.7E+07 (C)	88,000	1.4E+10	1.5E+08 (C)
ANTHRACENE	120-12-7	ID	41,000	6.7E+10	2.3E+08	41,000	2.9E+10	7.3E+08
BENZO(A)ANTHRACENE	56-55-3	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)
BENZO(A)PYRENE	50-32-8	NLL	NLL	1,500,000 (Q)	2,000 (Q)	NLL	1,900,000 (Q)	8,000 (Q)
BENZO(B)FLUORANTHENE	205-99-2	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)
BENZO(G,H,I)PERYLENE	191-24-2	NLL	NLL	8E+08 (Q)	2,500,000 (Q)	NLL	3.5E+08 (Q)	7,000,000 (Q)
BENZO(K)FLUORANTHENE	207-08-9	NLL	NLL	ID	200,000 (Q)	NLL	ID	800,000 (Q)
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	NLL	NLL	7E+08	2,800,000	NLL	8.9E+08	1.2E+07 (C)
CARBAZOLE	86-74-8	1,100	9,400	6.2E+07	530,000	39,000	7.8E+07	2,400,000
CHRYSENE	218-01-9	NLL	NLL	ID	2,000,000 (Q)	NLL	ID	8,000,000 (Q)
DIBENZO(A,H)ANTHRACENE	53-70-3	NLL	NLL	ID	2,000 (Q)	NLL	ID	8,000 (Q)
DIBENZOFURAN	132-64-9	1,700	ID	6,700,000	ID	ID	2,900,000	ID
DI-N-BUTYLPHTHALATE	84-74-2	11000	960,000	3.30E+09	2.70E+07	2.7E+6 (C)	1.50E+09	8.7E+7 (C)
FLUORANTHENE	206-44-0	5,500	730,000	9.3E+09	4.6E+07	730,000	4.1E+09	1.3E+08
FLUORENE	86-73-7	5,300	390,000	9.3E+09	2.7E+07	890,000	4.1E+09	8.7E+07
INDENO(1,2,3-CD)PYRENE	193-39-5	NLL	NLL	ID	20,000	NLL	ID	80,000
NAPHTHALENE (SVOC)	91-20-3S	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07
PHENANTHRENE	85-01-8	2,100	56,000	6,700,000	1,600,000	160,000	2,900,000	5,200,000
PYRENE	129-00-0	ID	480,000	6.7E+09	2.9E+07	480,000	2.9E+09	8.4E+07
Organics - VOCs (ug/kg)								
1,2,3-TRIMETHYLBENZENE	526-73-8	NA	NA	NA	NA	NA	NA	NA
1,2,4-TRIMETHYLBENZENE	95-63-6	570 (I)	2,100 (I)	8.2E+10 (I)	3.2E+07 (C,I)	2,100 (I)	3.6E+10 (I)	1E+08 (C,I)
1,3,5-TRIMETHYLBENZENE	108-67-8	1,100 (I)	1,800 (I)	8.2E+10 (I)	3.2E+07 (C,I)	1,800 (I)	3.6E+10 (I)	1E+08 (C,I)
2-METHYLNAPHTHALENE (VOC)	91-57-6V	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07
BENZENE	71-43-2	240 (I,X)	100 (I)	3.8E+08 (I)	180,000 (I)	100 (I)	4.7E+08 (I)	840,000 (C,I)
CYCLOHEXANE	110-82-7	NA	NA	NA	NA	NA	NA	NA
ETHYLBENZENE	100-41-4	360 (I)	1,500 (I)	1E+10 (I)	2.2E+07 (C,I)	1,500 (I)	1.3E+10 (I)	7.1E+07 (C, I)
HEXANE	110-54-3	NA	1.8E+05 (C)	1.30E+10	9.2E+07 (C)	5.1E+5 (C)	5.90E+09	3.0E+8 (C)

Geographic Location	QUINCY STAMP MILLS AREA																			
Station Name	QMCM-SS23		QMCM-SS24		QMCM-SS25		QMCM-SS26		QMCM-SS27		QMCM-SS28		QMCM-SS29		QMCM-SS30		QMCM-SS31		QMCM-SS32	
Field Sample ID	QMCM-SS23-0"-6"		QMCM-SS24-0"-6"		QMCM-SS25-0"-6"		QMCM-SS26-0"-6"		QMCM-SS27-0"-6"		QMCM-SS28-0"-6"		QMCM-SS29-0"-6"		QMCM-SS30-0"-6"		QMCM-SS31-0"-6"		QMCM-SS32-0"-6"	
Sample Date	05/16/17		05/16/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17	
Sample Interval (bgs)	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		0 - 0.5 ft		0 - 0.5 ft	
Sample Description	Brown to red SAND		Brown fine to medium SAND with some gravel; moist		Dark brown fine to medium SAND with some gravel; moist		Dark brown fine to coarse SAND with some gravel; moist		Dark brown fine to coarse SAND with some gravel; moist		Dark brown to black medium to coarse grained SAND with some gravel; moist		Brown SAND; moist		Brown coarse SAND; moist		Gray to brown coarse SAND with some gravel; moist		Dark brown fine to medium grained SAND with some silt; moist	
	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Organics - SVOCs (ug/kg)																				
1,1'-BIPHENYL	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2-METHYLNAPHTHALENE (SVOC)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ACENAPHTHENE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ACENAPHTHYLENE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ACETOPHENONE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ANTHRACENE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BENZO(A)ANTHRACENE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BENZO(A)PYRENE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BENZO(B)FLUORANTHENE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BENZO(G,H,I)PERYLENE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BENZO(K)FLUORANTHENE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BIS(2-ETHYLHEXYL)PHTHALATE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CARBAZOLE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CHRYSENE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DIBENZO(A,H)ANTHRACENE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DIBENZOFURAN	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DI-N-BUTYLPHTHALATE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
FLUORANTHENE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
FLUORENE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
INDENO(1,2,3-CD)PYRENE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
NAPHTHALENE (SVOC)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PHENANTHRENE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PYRENE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Organics - VOCs (ug/kg)																				
1,2,3-TRIMETHYLBENZENE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1,2,4-TRIMETHYLBENZENE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1,3,5-TRIMETHYLBENZENE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2-METHYLNAPHTHALENE (VOC)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BENZENE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CYCLOHEXANE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ETHYLBENZENE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
HEXANE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY STAMP MILLS AREA																			
Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	QMCM-SS23		QMCM-SS24		QMCM-SS25		QMCM-SS26		QMCM-SS27		QMCM-SS28		QMCM-SS29		QMCM-SS30		QMCM-SS31		QMCM-SS32	
Field Sample ID									QMCM-SS23-0"-6"		QMCM-SS24-0"-6"		QMCM-SS25-0"-6"		QMCM-SS26-0"-6"		QMCM-SS27-0"-6"		QMCM-SS28-0"-6"		QMCM-SS29-0"-6"		QMCM-SS30-0"-6"		QMCM-SS31-0"-6"		QMCM-SS32-0"-6"	
Sample Date									05/16/17		05/16/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17	
Sample Interval (bgs)									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		0 - 0.5 ft		0 - 0.5 ft	
Sample Description									Brown to red SAND		Brown fine to medium SAND with some gravel; moist		Dark brown fine to medium SAND with some gravel; moist		Dark brown fine to coarse SAND with some gravel; moist		Dark brown fine to coarse SAND with some gravel; moist		Dark brown to black medium to coarse grained SAND with some gravel; moist		Brown SAND; moist		Brown coarse SAND; moist		Gray to brown coarse SAND with some gravel; moist		Dark brown fine to medium grained SAND with some silt; moist	
									Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Organics - VOCs (ug/kg) (continued)																												
ISOPROPYLBENZENE	98-82-8	3,200	91,000	5.8E+09	2.5E+07 (C)	260,000	2.6E+09	8E+07 (C)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
M,P-XYLENE	1330-20-7	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
METHYLENE CHLORIDE	75-09-2	30,000 (X)	100	6.60E+09	1.30E+06	100	8.30E+09	5.8E+6 (C)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
NAPHTHALENE (VOC)	91-20-3V	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
N-BUTYLBENZENE	104-51-8	ID	1,600	2E+09	2,500,000	4,600	8.8E+08	8,000,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
N-PROPYLBENZENE	103-65-1	ID	1,600 (I)	1.3E+09 (I)	2,500,000 (I)	4,600 (I)	5.9E+08 (I)	8,000,000 (I)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
O-XYLENE	95-47-6	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
P-ISOPROPYL TOLUENE (p-CYMENE)	99-87-6	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SEC-BUTYLBENZENE	135-98-8	ID	1,600	4.00E+08	2.50E+06	1,600	1.80E+08	8.00E+06	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TOLUENE	108-88-3	5,400 (I)	16,000 (I)	2.7E+10 (I)	5E+07 (C,I)	16,000 (I)	1.2E+10 (I)	1.6E+08 (C,I)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
XYLENE - TOTAL	1330-20-7	820 (I)	5,600 (I)	2.9E+11 (I)	4.1E+08 (C,I)	5600 (I)	1.3E+11 (I)	1E+09 (I)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Organics - Pesticides (ug/kg)																												
4,4'-DDD	72-54-8	NLL	NLL	4.40E+07	95,000	NLL	5.60E+07	4.00E+05	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
4,4'-DDE	72-55-9	NLL	NLL	3.20E+07	45,000	NLL	4.00E+07	1.90E+05	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
4,4'-DDT	50-29-3	NLL	NLL	3.20E+07	57,000	NLL	4.00E+07	2.80E+05	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ALDRIN	309-00-2	NLL	NLL	6.40E+05	1,000	NLL	8.00E+05	4,300	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ALPHA-BHC	319-84-6	ID	18	1.70E+06	2,600	71	2.10E+06	12,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ALPHA-CHLORODANE	5103-71-9	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BETA-BHC	319-85-7	ID	37	5.90E+06	5,400	150	7.40E+06	25,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DIELDRIN	60-57-1	NLL	NLL	6.80E+05	1,100	NLL	8.50E+05	4,700	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDOSULFAN I	959-98-8	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDOSULFAN II	33213-65-9	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDOSULFAN SULFATE	1031-07-8	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDRIN	72-20-8	NLL	NLL	ID	65,000	NLL	ID	1.90E+05	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDRIN ALDEHYDE	7421-93-4	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDRIN KETONE	53494-70-5	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
GAMMA-CHLORDANE	5103-74-2	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
HEPTACHLOR EPOXIDE	102-457-3	NLL	NLL	1.20E+06	3,100	NLL	1.50E+06	9,500	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
METHOXYCHLOR	72-43-5	NA	16,000	ID	1.90E+06	16,000	ID	5.60E+06	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Asbestos (%)																												
ASBESTOS	ASB	NLL	NLL	1% (1.0E+7 (M); 68,000 ppb)	ID	NLL	1% (1.0E+7 (M); 85,000 ppb)	ID	ND	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

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

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY STAMP MILLS AREA																			
Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	QMCM-SS33		QMCM-SS34		QMCM-SS35		QMCM-SS36				QMCM-SS37		QMCM-SS38		QMCM-SS39		QMCM-SS40			
Field Sample ID									QMCM-SS33-0"-6"		QMCM-SS34-0"-6"		QMCM-SS35-0"-6"		QMCM-SS36-0"-6"		QMCM-SS36-0"-6"-DUP		QMCM-SS37-0"-6"		QMCM-SS38-0"-6"		QMCM-SS39-0"-6"		QMCM-SS40-0"-6"		QMCM-SS40-0"-6"-DUP	
Sample Date									05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17	
Sample Interval (bgs)									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		0 - 0.5 ft		0 - 0.5 ft	
Sample Description									Brown medium SAND; moist		Dark brown medium to coarse SAND; moist		Brown medium to coarse SAND; with some gravel, moist		Brown medium to coarse SAND; with some gravel		Field Duplicate		Dark brown gravelly SAND; moist with organics		Brown gravelly SAND; moist with organics		Dark brown gravelly SAND; moist with organics		Brown gravelly SAND; moist with organics		Field Duplicate	
									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	6,900 (B)	ID	50,000 (DD)	6,900 (B)	ID	370,000 (DD)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ANTIMONY	7440-36-0	1.2 (X)	4.3	13,000	180	4.3	5,900	670	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ARSENIC	7440-38-2	4.6	4.6	720	7.6	4.6	910	37	1.3	–	7	[2,4,11]	<0.5 U	–	0.8	–	7.8	[2,4,10,11]	6.6	[2,4,11]	55	[2,4,10,11,17]	75	[2,4,10,11,17]	63	[2,4,10,11,17]	95	[2,4,10,11,17]
BARIUM	7440-39-3	130	1,300 (G)	330,000	37,000	1,300	150,000	130,000	16	–	61	–	7.8	–	6.1	–	16	–	15	–	31	–	56	–	47	–	41	–
BERYLLIUM	7440-41-7	4.6 (G)	51	1,300	410	51	590	1,600	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CADMIUM	7440-43-9	1.6 (G,X)	6.0	1,700	550	6.0	2,200	2,100	<0.2 U	–	0.5	–	<0.2 U	–	<0.2 U	–	0.2	–	<0.2 U	–	<0.2 U	–	0.2	–	0.3	–	0.3	–
CALCIUM	7440-70-2	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CHROMIUM	7440-47-3	1,200,000 (G,H,X)	1,000,000 (D,H)	330,000 (H)	790,000 (H)	1,000,000 (D,H)	150,000 (H)	1,000,000 (D,H)	11	–	16	–	12	–	7	–	16	–	12	–	11	–	22	–	20	–	29	–
COBALT	7440-48-4	2.0	0.8	13,000	2,600	2.0	5,900	9,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
COPPER	7440-50-8	32 (G)	5,800	130,000	20,000	5,800	59,000	73,000	160	[2]	1,500	[2]	980	[2]	1,000	[2]	1,200	[2]	170	[2]	330	[2]	640	[2]	530	[2]	730	[2]
IRON	7439-89-6	NA	12,000 (B)	ID	160,000	12,000 (B)	ID	580,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
LEAD	7439-92-1	1,900 (G,X)	700	100,000	400	700	44,000	900 (DD)	4.8	–	230	–	9.8	–	15	–	19	–	6	–	130	–	27	–	31	–	23	–
LITHIUM	7439-93-2	9.8 (B)	9.8 (B)	2,300,000	4,200 (DD)	9.8 (B)	1,000,000	31,000 (DD)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MAGNESIUM	7439-95-4	NA	8,000	6,700,000	1,000,000 (D)	22,000	2,900,000	1,000,000 (D)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MANGANESE	7439-96-5	440 (B,G,X)	440 (B)	3,300	25,000	440 (B)	1,500	90,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MERCURY	7439-97-6	0.13 (B, Z)	1.7 (Z)	20000 (Z)	160 (Z)	1.7 (Z)	8800 (Z)	580 (Z)	0.08	–	0.8	[2]	0.5	[2]	<0.05 U	–	<0.06 U	–	0.07	–	0.6	[2]	0.08	–	<0.06 U	–	<0.06 U	–
NICKEL	7440-02-0	29 (G)	100	13,000	40,000	100	16,000	150,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
POTASSIUM	7440-09-7	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SELENIUM	7782-49-2	0.41 (B)	4.0	130,000	2,600	4.0	59,000	9,600	<0.2 U	–	<0.2 U	–	<0.2 U	–	<0.2 U	–	<0.2 U	–	0.3	–	2.6	[2]	3.4	[2]	0.5	[2]	0.7	[2]
SILVER	7440-22-4	1.0 (M); 0.027	4.5	6,700	2,500	13	2,900	9,000	0.2	–	1.5	[2]	0.5	–	0.6	–	0.9	–	0.5	–	0.4	–	0.5	–	1.2	[2]	1.1	[2]
SODIUM	7440-23-5	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
THALLIUM	7440-28-0	1.4	2.3	13,000	35	2.3	5,900	130	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
VANADIUM	7440-62-2	430	72	ID	750 (DD)	990	ID	5,500 (DD)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ZINC	7440-66-6	62 (G)	2,400	ID	170,000	5,000	ID	630,000	34	–	150	[2]	35	–	13	–	52	–	26	–	36	–	45	–	52	–	77	[2]
Inorganics - Cyanide (mg/kg)																												
CYANIDE	57-12-5	0.1 (P,R)	4.0 (P,R)	250 (P,R)	12 (P,R)	4.0 (P,R)	250 (P,R)	250 (P,R)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Organics - PCBs (ug/kg)																												
AROCLOR-1260	11096-82-5	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AROCLOR-1262	37324-23-5	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TOTAL PCBS	TPCB	NLL	NLL	5,200,000 (J)	1,000 (J,T)	NLL	6,500,000 (J)	1,000 (J,T)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY STAMP MILLS AREA																			
Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	QMCM-SS33		QMCM-SS34		QMCM-SS35		QMCM-SS36				QMCM-SS37		QMCM-SS38		QMCM-SS39		QMCM-SS40			
Field Sample ID									QMCM-SS33-0"-6"		QMCM-SS34-0"-6"		QMCM-SS35-0"-6"		QMCM-SS36-0"-6"		QMCM-SS36-0"-6"-DUP		QMCM-SS37-0"-6"		QMCM-SS38-0"-6"		QMCM-SS39-0"-6"		QMCM-SS40-0"-6"		QMCM-SS40-0"-6"-DUP	
Sample Date									05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17	
Sample Interval (bgs)									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		0 - 0.5 ft		0 - 0.5 ft	
Sample Description									Brown medium SAND; moist		Dark brown medium to coarse SAND; moist		Brown medium to coarse SAND; with some gravel, moist		Brown medium to coarse SAND; with some gravel		Field Duplicate		Dark brown gravelly SAND; moist with organics		Brown gravelly SAND; moist with organics		Dark brown gravelly SAND; moist with organics		Brown gravelly SAND; moist with organics		Field Duplicate	
									Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Organics - SVOCs (ug/kg)																												
1,1'-BIPHENYL	92-52-4	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2-METHYLNAPHTHALENE (SVOC)	91-57-6S	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ACENAPHTHENE	83-32-9	8,700	300,000	1.4E+10	4.1E+07	880,000	6.2E+09	1.3E+08	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ACENAPHTHYLENE	208-96-8	ID	5,900	2.3E+09	1,600,000	17,000	1E+09	5,200,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ACETOPHENONE	98-86-2	ID	30,000	3.3E+10	4.7E+07 (C)	88,000	1.4E+10	1.5E+08 (C)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ANTHRACENE	120-12-7	ID	41,000	6.7E+10	2.3E+08	41,000	2.9E+10	7.3E+08	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BENZO(A)ANTHRACENE	56-55-3	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BENZO(A)PYRENE	50-32-8	NLL	NLL	1,500,000 (Q)	2,000 (Q)	NLL	1,900,000 (Q)	8,000 (Q)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BENZO(B)FLUORANTHENE	205-99-2	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BENZO(G,H,I)PERYLENE	191-24-2	NLL	NLL	8E+08 (Q)	2,500,000 (Q)	NLL	3.5E+08 (Q)	7,000,000 (Q)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BENZO(K)FLUORANTHENE	207-08-9	NLL	NLL	ID	200,000 (Q)	NLL	ID	800,000 (Q)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	NLL	NLL	7E+08	2,800,000	NLL	8.9E+08	1.2E+07 (C)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CARBAZOLE	86-74-8	1,100	9,400	6.2E+07	530,000	39,000	7.8E+07	2,400,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CHRYSENE	218-01-9	NLL	NLL	ID	2,000,000 (Q)	NLL	ID	8,000,000 (Q)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DIBENZO(A,H)ANTHRACENE	53-70-3	NLL	NLL	ID	2,000 (Q)	NLL	ID	8,000 (Q)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DIBENZOFURAN	132-64-9	1,700	ID	6,700,000	ID	ID	2,900,000	ID	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DI-N-BUTYLPHTHALATE	84-74-2	11000	960,000	3.30E+09	2.70E+07	2.7E+6 (C)	1.50E+09	8.7E+7 (C)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
FLUORANTHENE	206-44-0	5,500	730,000	9.3E+09	4.6E+07	730,000	4.1E+09	1.3E+08	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
FLUORENE	86-73-7	5,300	390,000	9.3E+09	2.7E+07	890,000	4.1E+09	8.7E+07	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
INDENO(1,2,3-CD)PYRENE	193-39-5	NLL	NLL	ID	20,000	NLL	ID	80,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
NAPHTHALENE (SVOC)	91-20-3S	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PHENANTHRENE	85-01-8	2,100	56,000	6,700,000	1,600,000	160,000	2,900,000	5,200,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PYRENE	129-00-0	ID	480,000	6.7E+09	2.9E+07	480,000	2.9E+09	8.4E+07	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Organics - VOCs (ug/kg)																												
1,2,3-TRIMETHYLBENZENE	526-73-8	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1,2,4-TRIMETHYLBENZENE	95-63-6	570 (I)	2,100 (I)	8.2E+10 (I)	3.2E+07 (C,I)	2,100 (I)	3.6E+10 (I)	1E+08 (C,I)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1,3,5-TRIMETHYLBENZENE	108-67-8	1,100 (I)	1,800 (I)	8.2E+10 (I)	3.2E+07 (C,I)	1,800 (I)	3.6E+10 (I)	1E+08 (C,I)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2-METHYLNAPHTHALENE (VOC)	91-57-6V	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BENZENE	71-43-2	240 (I,X)	100 (I)	3.8E+08 (I)	180,000 (I)	100 (I)	4.7E+08 (I)	840,000 (C,I)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CYCLOHEXANE	110-82-7	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ETHYLBENZENE	100-41-4	360 (I)	1,500 (I)	1E+10 (I)	2.2E+07 (C,I)	1,500 (I)	1.3E+10 (I)	7.1E+07 (C, I)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
HEXANE	110-54-3	NA	1.8E+05 (C)	1.30E+10	9.2E+07 (C)	5.1E+5 (C)	5.90E+09	3.0E+8 (C)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY STAMP MILLS AREA																			
Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	QMCM-SS33		QMCM-SS34		QMCM-SS35		QMCM-SS36				QMCM-SS37		QMCM-SS38		QMCM-SS39		QMCM-SS40			
Field Sample ID									QMCM-SS33-0"-6"		QMCM-SS34-0"-6"		QMCM-SS35-0"-6"		QMCM-SS36-0"-6"		QMCM-SS36-0"-6"-DUP		QMCM-SS37-0"-6"		QMCM-SS38-0"-6"		QMCM-SS39-0"-6"		QMCM-SS40-0"-6"		QMCM-SS40-0"-6"-DUP	
Sample Date									05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17	
Sample Interval (bgs)									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		0 - 0.5 ft		0 - 0.5 ft	
Sample Description									Brown medium SAND; moist		Dark brown medium to coarse SAND; moist		Brown medium to coarse SAND; with some gravel, moist		Brown medium to coarse SAND; with some gravel		Field Duplicate		Dark brown gravelly SAND; moist with organics		Brown gravelly SAND; moist with organics		Dark brown gravelly SAND; moist with organics		Brown gravelly SAND; moist with organics		Field Duplicate	
									Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Organics - VOCs (ug/kg) (continued)																												
ISOPROPYLBENZENE	98-82-8	3,200	91,000	5.8E+09	2.5E+07 (C)	260,000	2.6E+09	8E+07 (C)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
M,P-XYLENE	1330-20-7	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
METHYLENE CHLORIDE	75-09-2	30,000 (X)	100	6.60E+09	1.30E+06	100	8.30E+09	5.8E+6 (C)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
NAPHTHALENE (VOC)	91-20-3V	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
N-BUTYLBENZENE	104-51-8	ID	1,600	2E+09	2,500,000	4,600	8.8E+08	8,000,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
N-PROPYLBENZENE	103-65-1	ID	1,600 (I)	1.3E+09 (I)	2,500,000 (I)	4,600 (I)	5.9E+08 (I)	8,000,000 (I)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
O-XYLENE	95-47-6	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
P-ISOPROPYL TOLUENE (p-CYMENE)	99-87-6	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SEC-BUTYLBENZENE	135-98-8	ID	1,600	4.00E+08	2.50E+06	1,600	1.80E+08	8.00E+06	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TOLUENE	108-88-3	5,400 (I)	16,000 (I)	2.7E+10 (I)	5E+07 (C,I)	16,000 (I)	1.2E+10 (I)	1.6E+08 (C,I)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
XYLENE - TOTAL	1330-20-7	820 (I)	5,600 (I)	2.9E+11 (I)	4.1E+08 (C,I)	5600 (I)	1.3E+11 (I)	1E+09 (I)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Organics - Pesticides (ug/kg)																												
4,4'-DDD	72-54-8	NLL	NLL	4.40E+07	95,000	NLL	5.60E+07	4.00E+05	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
4,4'-DDE	72-55-9	NLL	NLL	3.20E+07	45,000	NLL	4.00E+07	1.90E+05	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
4,4'-DDT	50-29-3	NLL	NLL	3.20E+07	57,000	NLL	4.00E+07	2.80E+05	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ALDRIN	309-00-2	NLL	NLL	6.40E+05	1,000	NLL	8.00E+05	4,300	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ALPHA-BHC	319-84-6	ID	18	1.70E+06	2,600	71	2.10E+06	12,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ALPHA-CHLORODANE	5103-71-9	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BETA-BHC	319-85-7	ID	37	5.90E+06	5,400	150	7.40E+06	25,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DIELDRIN	60-57-1	NLL	NLL	6.80E+05	1,100	NLL	8.50E+05	4,700	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDOSULFAN I	959-98-8	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDOSULFAN II	33213-65-9	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDOSULFAN SULFATE	1031-07-8	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDRIN	72-20-8	NLL	NLL	ID	65,000	NLL	ID	1.90E+05	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDRIN ALDEHYDE	7421-93-4	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDRIN KETONE	53494-70-5	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
GAMMA-CHLORDANE	5103-74-2	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
HEPTACHLOR EPOXIDE	102-457-3	NLL	NLL	1.20E+06	3,100	NLL	1.50E+06	9,500	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
METHOXYCHLOR	72-43-5	NA	16,000	ID	1.90E+06	16,000	ID	5.60E+06	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Asbestos (%)																												
ASBESTOS	ASB	NLL	NLL	1% (1.0E+7 (M); 68,000 ppb)	ID	NLL	1% (1.0E+7 (M); 85,000 ppb)	ID	–	–	–	–	ND	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

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

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY STAMP MILLS AREA																			
Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	QMCM-SS47		QMCM-SS48				QMCM-SS49		QMCM-SS50				QMCM-SS51		QMCM-SS52		QMCM-SS53		QMCM-SS54	
Field Sample ID									QMCM-SS47-0"-6"		QMCM-SS48-0"-6"		QMCM-SS48-0"-6"-DUP		QMCM-SS49-0"-6"		QMCM-SS-50-0"-6"		QMCM-SS-50-0"-6" FD		QMCM-SS-51-0"-6"		QMCM-SS 52-0"-6"		QMCM-SS-53-0"-6"		QMCM-SS-54-0"-6"	
Sample Date									05/16/17		05/16/17		05/16/17		05/16/17		09/17/17		09/17/17		09/17/17		09/17/17		09/17/17		09/17/17	
Sample Interval (bgs)									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		0 - 0.5 ft		0 - 0.5 ft	
Sample Description									Dark brown SAND with trace gravel; moist, organics		Dark brown SAND with trace gravel; moist		Field Duplicate		Dark brown to black medium SAND with organics		Dark brown SAND to gravel		Field Duplicate		Dark brown SAND with gravel; organics, brick debris		Dark brown sandy loam; organics		Brown sandy loam		Dark brown medium SAND; organics	
									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	6,900 (B)	ID	50,000 (DD)	6,900 (B)	ID	370,000 (DD)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ANTIMONY	7440-36-0	1.2 (X)	4.3	13,000	180	4.3	5,900	670	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ARSENIC	7440-38-2	4.6	4.6	720	7.6	4.6	910	37	**2.6**	–	**2.4**	–	**1.9**	–	**3.9**	–	–	–	–	–	–	–	–	–	–	–	–	–
BARIUM	7440-39-3	130	1,300 (G)	330,000	37,000	1,300	150,000	130,000	**22**	–	**24**	–	**20**	–	**100**	–	–	–	–	–	–	–	–	–	–	–	–	–
BERYLLIUM	7440-41-7	4.6 (G)	51	1,300	410	51	590	1,600	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CADMIUM	7440-43-9	1.6 (G,X)	6.0	1,700	550	6.0	2,200	2,100	<0.2 U	–	**0.7**	–	**0.6**	–	**0.5**	–	–	–	–	–	–	–	–	–	–	–	–	–
CALCIUM	7440-70-2	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CHROMIUM	7440-47-3	1,200,000 (G,H,X)	1,000,000 (D,H)	330,000 (H)	790,000 (H)	1,000,000 (D,H)	150,000 (H)	1,000,000 (D,H)	**14**	–	**33**	–	**34**	–	**7.5**	–	–	–	–	–	–	–	–	–	–	–	–	–
COBALT	7440-48-4	2.0	0.8	13,000	2,600	2.0	5,900	9,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
COPPER	7440-50-8	32 (G)	5,800	130,000	20,000	5,800	59,000	73,000	**1,100**	[2]	**6,100**	[2,4,11]	**3,300**	[2]	**240**	[2]	–	–	–	–	–	–	–	–	–	–	–	–
IRON	7439-89-6	NA	12,000 (B)	ID	160,000	12,000 (B)	ID	580,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
LEAD	7439-92-1	1,900 (G,X)	700	100,000	400	700	44,000	900 (DD)	**60**	–	**140**	–	**130**	–	**39**	–	–	–	–	–	–	–	–	–	–	–	–	–
LITHIUM	7439-93-2	9.8 (B)	9.8 (B)	2,300,000	4,200 (DD)	9.8 (B)	1,000,000	31,000 (DD)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MAGNESIUM	7439-95-4	NA	8,000	6,700,000	1,000,000 (D)	22,000	2,900,000	1,000,000 (D)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MANGANESE	7439-96-5	440 (B,G,X)	440 (B)	3,300	25,000	440 (B)	1,500	90,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MERCURY	7439-97-6	0.13 (B, Z)	1.7 (Z)	20000 (Z)	160 (Z)	1.7 (Z)	8800 (Z)	580 (Z)	**0.2**	[2]	**0.1**	–	**0.2**	[2]	**0.2**	[2]	–	–	–	–	–	–	–	–	–	–	–	–
NICKEL	7440-02-0	29 (G)	100	13,000	40,000	100	16,000	150,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
POTASSIUM	7440-09-7	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SELENIUM	7782-49-2	0.41 (B)	4.0	130,000	2,600	4.0	59,000	9,600	<0.2 U	–	<0.2 U	–	<0.2 U	–	**0.2**	–	–	–	–	–	–	–	–	–	–	–	–	–
SILVER	7440-22-4	1.0 (M); 0.027	4.5	6,700	2,500	13	2,900	9,000	**0.6**	–	**2.1**	[2]	**2.6**	[2]	**0.5**	–	–	–	–	–	–	–	–	–	–	–	–	–
SODIUM	7440-23-5	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
THALLIUM	7440-28-0	1.4	2.3	13,000	35	2.3	5,900	130	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
VANADIUM	7440-62-2	430	72	ID	750 (DD)	990	ID	5,500 (DD)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ZINC	7440-66-6	62 (G)	2,400	ID	170,000	5,000	ID	630,000	**51**	–	**200**	[2]	**180**	[2]	**46**	–	–	–	–	–	–	–	–	–	–	–	–	–
Inorganics - Cyanide (mg/kg)																												
CYANIDE	57-12-5	0.1 (P,R)	4.0 (P,R)	250 (P,R)	12 (P,R)	4.0 (P,R)	250 (P,R)	250 (P,R)	<0.13 U	–	<0.11 U	--	--	–	--	–	--	–	–	–	–	–	–	–	–	–	–	–
Organics - PCBs (ug/kg)																												
AROCLOR-1260	11096-82-5	NA	NA	NA	NA	NA	NA	NA	<230 U	--	<110 U	--	–	–	<340 U	--	--	--	--	--	--	--	--	--	--	--	--	--
AROCLOR-1262	37324-23-5	NA	NA	NA	NA	NA	NA	NA	<230 U	--	<110 U	--	--	–	<340 U	--	--	--	--	--	--	--	--	--	--	--	--	--
TOTAL PCBS	TPCB	NLL	NLL	5,200,000 (J)	1,000 (J,T)	NLL	6,500,000 (J)	1,000 (J,T)	ND	--	ND	--	–	–	ND	--	--	--	--	--	--	--	--	--	--	--	--	--

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY STAMP MILLS AREA																			
Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	QMCM-SS47		QMCM-SS48				QMCM-SS49		QMCM-SS50				QMCM-SS51		QMCM-SS52		QMCM-SS53		QMCM-SS54	
Field Sample ID									QMCM-SS47-0"-6"		QMCM-SS48-0"-6"		QMCM-SS48-0"-6"-DUP		QMCM-SS49-0"-6"		QMCM-SS-50-0"-6"		QMCM-SS-50-0"-6" FD		QMCM-SS-51-0"-6"		QMCM-SS 52-0"-6"		QMCM-SS-53-0"-6"		QMCM-SS-54-0"-6"	
Sample Date									05/16/17		05/16/17		05/16/17		05/16/17		09/17/17		09/17/17		09/17/17		09/17/17		09/17/17		09/17/17	
Sample Interval (bgs)									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		0 - 0.5 ft		0 - 0.5 ft	
Sample Description									Dark brown SAND with trace gravel; moist, organics		Dark brown SAND with trace gravel; moist		Field Duplicate		Dark brown to black medium SAND with organics		Dark brown SAND to gravel		Field Duplicate		Dark brown SAND with gravel; organics, brick debris		Dark brown sandy loam; organics		Brown sandy loam		Dark brown medium SAND; organics	
									Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Organics - SVOCs (ug/kg)																												
1,1'-BIPHENYL	92-52-4	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-METHYLNAPHTHALENE (SVOC)	91-57-6S	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07	**2,100**	--	<550 U	--	--	--	<860 U	--	<6500 U	--	<6000 U	--	**650 J**	--	<550 U	--	<530 U	--	<550 U	--
ACENAPHTHENE	83-32-9	8,700	300,000	1.4E+10	4.1E+07	880,000	6.2E+09	1.3E+08	**1,900**	--	<220 U	--	--	--	<340 U	--	<2600 U	--	<2400 U	--	**840**	--	<220 U	--	<210 U	--	<220 U	--
ACENAPHTHYLENE	208-96-8	ID	5,900	2.3E+09	1,600,000	17,000	1E+09	5,200,000	**470**	--	<220 U	--	--	--	<340 U	--	<2600 U	--	<2400 U	--	<260 U	--	<220 U	--	<210 U	--	<220 U	--
ACETOPHENONE	98-86-2	ID	30,000	3.3E+10	4.7E+07 (C)	88,000	1.4E+10	1.5E+08 (C)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ANTHRACENE	120-12-7	ID	41,000	6.7E+10	2.3E+08	41,000	2.9E+10	7.3E+08	**3,900**	--	<220 U	--	--	--	<340 U	--	**12,000**	--	**8,900**	--	**3,400**	--	**440**	--	**310**	--	<220 U	--
BENZO(A)ANTHRACENE	56-55-3	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)	**5,800**	--	**570**	--	--	--	<340 U	--	**100,000**	[10,17]	**55,000**	[10]	**13,000**	--	**2,600 J**	--	**1,600**	--	**310**	--
BENZO(A)PYRENE	50-32-8	NLL	NLL	1,500,000 (Q)	2,000 (Q)	NLL	1,900,000 (Q)	8,000 (Q)	**5,700**	[10]	**630**	--	--	--	<680 U	--	**140,000**	[10,17]	**76,000**	[10,17]	**15,000**	[10,17]	**2,500**	[10]	**1,500**	--	<440 U	--
BENZO(B)FLUORANTHENE	205-99-2	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)	**7,400**	--	**870**	--	--	--	<680 U	--	**180,000**	[10,17]	**100,000**	[10,17]	**21,000**	[10]	**3,700 J**	--	**2,100**	--	**440**	--
BENZO(G,H,I)PERYLENE	191-24-2	NLL	NLL	8E+08 (Q)	2,500,000 (Q)	NLL	3.5E+08 (Q)	7,000,000 (Q)	**2,300**	--	<440 U	--	--	--	<680 U	--	**89,000**	--	**53,000**	--	**6,800**	--	**1,400**	--	**850**	--	<440 U	--
BENZO(K)FLUORANTHENE	207-08-9	NLL	NLL	ID	200,000 (Q)	NLL	ID	800,000 (Q)	**3,000**	--	<440 U	--	--	--	<680 U	--	**70,000**	--	**34,000**	--	**7,700**	--	**1,200**	--	**760**	--	<440 U	--
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	NLL	NLL	7E+08	2,800,000	NLL	8.9E+08	1.2E+07 (C)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CARBAZOLE	86-74-8	1,100	9,400	6.2E+07	530,000	39,000	7.8E+07	2,400,000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHRYSENE	218-01-9	NLL	NLL	ID	2,000,000 (Q)	NLL	ID	8,000,000 (Q)	**7,600**	--	**510**	--	--	--	<340 U	--	**110,000**	--	**60,000**	--	**13,000**	--	**2,800**	--	**1,700**	--	**350**	--
DIBENZO(A,H)ANTHRACENE	53-70-3	NLL	NLL	ID	2,000 (Q)	NLL	ID	8,000 (Q)	**950**	--	<440 U	--	--	--	<680 U	--	**28,000**	[10,17]	**15,000**	[10,17]	**2,100**	[10]	<440 U	--	<430 U	--	<440 U	--
DIBENZOFURAN	132-64-9	1,700	ID	6,700,000	ID	ID	2,900,000	ID	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DI-N-BUTYLPHTHALATE	84-74-2	11000	960,000	3.30E+09	2.70E+07	2.7E+6 (C)	1.50E+09	8.7E+7 (C)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUORANTHENE	206-44-0	5,500	730,000	9.3E+09	4.6E+07	730,000	4.1E+09	1.3E+08	**14,000**	[2]	**1,400**	--	--	--	<340 U	--	**140,000**	[2]	**76,000**	[2]	**26,000**	[2]	**6,300 J**	[2]	**3900**	--	**770**	--
FLUORENE	86-73-7	5,300	390,000	9.3E+09	2.7E+07	890,000	4.1E+09	8.7E+07	**3,300**	--	<220 U	--	--	--	<340 U	--	<2600 U	--	<2400 U	--	**1,500**	--	**210 J**	--	<210 U	--	<220 U	--
INDENO(1,2,3-CD)PYRENE	193-39-5	NLL	NLL	ID	20,000	NLL	ID	80,000	**2,400**	--	<440 U	--	--	--	<680 U	--	**81,000**	[10,17]	**46,000**	[10]	**6,600**	--	**1,300**	--	**760**	--	<440 U	--
NAPHTHALENE (SVOC)	91-20-3S	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	**6,300**	[2]	<220 U	--	--	--	<340 U	--	**4,800**	[2]	<2400 U	--	**1,400**	[2]	**430**	--	<210 U	--	<220 U	--
PHENANTHRENE	85-01-8	2,100	56,000	6,700,000	1,600,000	160,000	2,900,000	5,200,000	**13,000**	[2]	**870**	--	--	--	<340 U	--	**59,000**	[2,4]	**43,000**	[2]	**14,000**	[2]	**3,600 J**	[2]	**2000**	--	**530**	--
PYRENE	129-00-0	ID	480,000	6.7E+09	2.9E+07	480,000	2.9E+09	8.4E+07	**12,000**	--	**1,000**	--	--	--	<340 U	--	**120,000**	--	**72,000**	--	**27,000**	--	**4,500 J**	--	**2900**	--	**610**	--
Organics - VOCs (ug/kg)																												
1,2,3-TRIMETHYLBENZENE	526-73-8	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	<120 U	--	<86 U	--	<85 U	--	<88 U	--	<64 U	--	<60 U	--	<63 UJ	--
1,2,4-TRIMETHYLBENZENE	95-63-6	570 (I)	2,100 (I)	8.2E+10 (I)	3.2E+07 (C,I)	2,100 (I)	3.6E+10 (I)	1E+08 (C,I)	--	--	--	--	--	--	<120 U	--	<86 U	--	<85 U	--	<88 U	--	**90**	--	<60 U	--	<63 UJ	--
1,3,5-TRIMETHYLBENZENE	108-67-8	1,100 (I)	1,800 (I)	8.2E+10 (I)	3.2E+07 (C,I)	1,800 (I)	3.6E+10 (I)	1E+08 (C,I)	--	--	--	--	--	--	<120 U	--	<86 U	--	<85 U	--	<88 U	--	<64 U	--	<60 U	--	<63 UJ	--
2-METHYLNAPHTHALENE (VOC)	91-57-6V	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07	--	--	--	--	--	--	<590 U	--	<430 U	--	**2900**	--	<440 U	--	<320 U	--	<300 U	--	<310 UJ	--
BENZENE	71-43-2	240 (I,X)	100 (I)	3.8E+08 (I)	180,000 (I)	100 (I)	4.7E+08 (I)	840,000 (C,I)	--	--	--	--	--	--	<120 U	--	<86 U	--	<85 U	--	<88 U	--	<64 U	--	<60 U	--	<63 UJ	--
CYCLOHEXANE	110-82-7	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	<590 U	--	<430 U	--	<420 U	--	<440 U	--	<320 U	--	<300 U	--	<310 UJ	--
ETHYLBENZENE	100-41-4	360 (I)	1,500 (I)	1E+10 (I)	2.2E+07 (C,I)	1,500 (I)	1.3E+10 (I)	7.1E+07 (C, I)	--	--	--	--	--	--	<120 U	--	<86 U	--	<85 U	--	<88 U	--	<64 U	--	<60 U	--	<63 UJ	--
HEXANE	110-54-3	NA	1.8E+05 (C)	1.30E+10	9.2E+07 (C)	5.1E+5 (C)	5.90E+09	3.0E+8 (C)	--	--	--	--	--	--	<120 U	--	<86 U	--	<85 U	--	<88 U	--	<64 U	--	<60 U	--	<63 UJ	--

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY STAMP MILLS AREA																			
Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	QMCM-SS47		QMCM-SS48				QMCM-SS49		QMCM-SS50				QMCM-SS51		QMCM-SS52		QMCM-SS53		QMCM-SS54	
Field Sample ID									QMCM-SS47-0"-6"		QMCM-SS48-0"-6"		QMCM-SS48-0"-6"-DUP		QMCM-SS49-0"-6"		QMCM-SS-50-0"-6"		QMCM-SS-50-0"-6" FD		QMCM-SS-51-0"-6"		QMCM-SS 52-0"-6"		QMCM-SS-53-0"-6"		QMCM-SS-54-0"-6"	
Sample Date									05/16/17		05/16/17		05/16/17		05/16/17		09/17/17		09/17/17		09/17/17		09/17/17		09/17/17		09/17/17	
Sample Interval (bgs)									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		0 - 0.5 ft		0 - 0.5 ft	
Sample Description									Dark brown SAND with trace gravel; moist, organics		Dark brown SAND with trace gravel; moist		Field Duplicate		Dark brown to black medium SAND with organics		Dark brown SAND to gravel		Field Duplicate		Dark brown SAND with gravel; organics, brick debris		Dark brown sandy loam; organics		Brown sandy loam		Dark brown medium SAND; organics	
									Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Organics - VOCs (ug/kg) (continued)																												
ISOPROPYLBENZENE	98-82-8	3,200	91,000	5.8E+09	2.5E+07 (C)	260,000	2.6E+09	8E+07 (C)	–	–	–	–	–	–	<120 U	–	<86 U	–	<85 U	–	<88 U	–	<64 U	–	<60 U	–	<63 UJ	–
M,P-XYLENE	1330-20-7	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	<230 U	–	<170 U	–	<170 U	–	<180 U	–	<130 U	–	<120 U	–	<130 UJ	–
METHYLENE CHLORIDE	75-09-2	30,000 (X)	100	6.60E+09	1.30E+06	100	8.30E+09	5.8E+6 (C)	–	–	–	–	–	–	<230 U	–	<170 U	–	<170 U	–	<180 U	–	<130 U	–	<120 U	–	<130 UJ	–
NAPHTHALENE (VOC)	91-20-3V	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	–	–	–	–	–	–	<590 U	–	**760**	[2]	**4,000**	[2]	<440 U	–	<320 U	–	<300 U	–	<310 UJ	–
N-BUTYLBENZENE	104-51-8	ID	1,600	2E+09	2,500,000	4,600	8.8E+08	8,000,000	–	–	–	–	–	–	<120 U	–	<86 U	–	<85 U	–	<88 U	–	<64 U	–	<60 U	–	<63 UJ	–
N-PROPYLBENZENE	103-65-1	ID	1,600 (I)	1.3E+09 (I)	2,500,000 (I)	4,600 (I)	5.9E+08 (I)	8,000,000 (I)	–	–	–	–	–	–	<120 U	–	<86 U	–	<85 U	–	<88 U	–	<64 U	–	<60 U	–	<63 UJ	–
O-XYLENE	95-47-6	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	<120 U	–	<86 U	–	<85 U	–	<88 U	–	**85**	–	<60 U	–	<63 UJ	–
P-ISOPROPYL TOLUENE (p-CYMENE)	99-87-6	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SEC-BUTYLBENZENE	135-98-8	ID	1,600	4.00E+08	2.50E+06	1,600	1.80E+08	8.00E+06	–	–	–	–	–	–	<120 U	–	<86 U	–	<85 U	–	<88 U	–	<64 U	–	<60 U	–	<63 UJ	–
TOLUENE	108-88-3	5,400 (I)	16,000 (I)	2.7E+10 (I)	5E+07 (C,I)	16,000 (I)	1.2E+10 (I)	1.6E+08 (C,I)	–	–	–	–	–	–	<120 U	–	<86 U	–	<85 U	–	<88 U	–	**87**	–	<60 U	–	<63 UJ	–
XYLENE - TOTAL	1330-20-7	820 (I)	5,600 (I)	2.9E+11 (I)	4.1E+08 (C,I)	5600 (I)	1.3E+11 (I)	1E+09 (I)	–	–	–	–	–	–	ND	–	ND	–	ND	–	ND	–	**85**	–	ND	–	ND	–
Organics - Pesticides (ug/kg)																												
4,4'-DDD	72-54-8	NLL	NLL	4.40E+07	95,000	NLL	5.60E+07	4.00E+05	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
4,4'-DDE	72-55-9	NLL	NLL	3.20E+07	45,000	NLL	4.00E+07	1.90E+05	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
4,4'-DDT	50-29-3	NLL	NLL	3.20E+07	57,000	NLL	4.00E+07	2.80E+05	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ALDRIN	309-00-2	NLL	NLL	6.40E+05	1,000	NLL	8.00E+05	4,300	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ALPHA-BHC	319-84-6	ID	18	1.70E+06	2,600	71	2.10E+06	12,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ALPHA-CHLORODANE	5103-71-9	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BETA-BHC	319-85-7	ID	37	5.90E+06	5,400	150	7.40E+06	25,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DIELDRIN	60-57-1	NLL	NLL	6.80E+05	1,100	NLL	8.50E+05	4,700	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDOSULFAN I	959-98-8	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDOSULFAN II	33213-65-9	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDOSULFAN SULFATE	1031-07-8	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDRIN	72-20-8	NLL	NLL	ID	65,000	NLL	ID	1.90E+05	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDRIN ALDEHYDE	7421-93-4	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDRIN KETONE	53494-70-5	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
GAMMA-CHLORDANE	5103-74-2	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
HEPTACHLOR EPOXIDE	102-457-3	NLL	NLL	1.20E+06	3,100	NLL	1.50E+06	9,500	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
METHOXYCHLOR	72-43-5	NA	16,000	ID	1.90E+06	16,000	ID	5.60E+06	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Asbestos (%)																												
ASBESTOS	ASB	NLL	NLL	1% (1.0E+7 (M); 68,000 ppb)	ID	NLL	1% (1.0E+7 (M); 85,000 ppb)	ID	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

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

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria
Inorganics - Metals (mg/kg)								
ALUMINUM	7429-90-5	NA	6,900 (B)	ID	50,000 (DD)	6,900 (B)	ID	370,000 (DD)
ANTIMONY	7440-36-0	1.2 (X)	4.3	13,000	180	4.3	5,900	670
ARSENIC	7440-38-2	4.6	4.6	720	7.6	4.6	910	37
BARIUM	7440-39-3	130	1,300 (G)	330,000	37,000	1,300	150,000	130,000
BERYLLIUM	7440-41-7	4.6 (G)	51	1,300	410	51	590	1,600
CADMIUM	7440-43-9	1.6 (G,X)	6.0	1,700	550	6.0	2,200	2,100
CALCIUM	7440-70-2	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	7440-47-3	1,200,000 (G,H,X)	1,000,000 (D,H)	330,000 (H)	790,000 (H)	1,000,000 (D,H)	150,000 (H)	1,000,000 (D,H)
COBALT	7440-48-4	2.0	0.8	13,000	2,600	2.0	5,900	9,000
COPPER	7440-50-8	32 (G)	5,800	130,000	20,000	5,800	59,000	73,000
IRON	7439-89-6	NA	12,000 (B)	ID	160,000	12,000 (B)	ID	580,000
LEAD	7439-92-1	1,900 (G,X)	700	100,000	400	700	44,000	900 (DD)
LITHIUM	7439-93-2	9.8 (B)	9.8 (B)	2,300,000	4,200 (DD)	9.8 (B)	1,000,000	31,000 (DD)
MAGNESIUM	7439-95-4	NA	8,000	6,700,000	1,000,000 (D)	22,000	2,900,000	1,000,000 (D)
MANGANESE	7439-96-5	440 (B,G,X)	440 (B)	3,300	25,000	440 (B)	1,500	90,000
MERCURY	7439-97-6	0.13 (B, Z)	1.7 (Z)	20000 (Z)	160 (Z)	1.7 (Z)	8800 (Z)	580 (Z)
NICKEL	7440-02-0	29 (G)	100	13,000	40,000	100	16,000	150,000
POTASSIUM	7440-09-7	NA	NA	NA	NA	NA	NA	NA
SELENIUM	7782-49-2	0.41 (B)	4.0	130,000	2,600	4.0	59,000	9,600
SILVER	7440-22-4	1.0 (M); 0.027	4.5	6,700	2,500	13	2,900	9,000
SODIUM	7440-23-5	NA	NA	NA	NA	NA	NA	NA
THALLIUM	7440-28-0	1.4	2.3	13,000	35	2.3	5,900	130
VANADIUM	7440-62-2	430	72	ID	750 (DD)	990	ID	5,500 (DD)
ZINC	7440-66-6	62 (G)	2,400	ID	170,000	5,000	ID	630,000
Inorganics - Cyanide (mg/kg)								
CYANIDE	57-12-5	0.1 (P,R)	4.0 (P,R)	250 (P,R)	12 (P,R)	4.0 (P,R)	250 (P,R)	250 (P,R)
Organics - PCBs (ug/kg)								
AROCLOR-1260	11096-82-5	NA	NA	NA	NA	NA	NA	NA
AROCLOR-1262	37324-23-5	NA	NA	NA	NA	NA	NA	NA
TOTAL PCBS	TPCB	NLL	NLL	5,200,000 (J)	1,000 (J,T)	NLL	6,500,000 (J)	1,000 (J,T)

Geographic Location	QUINCY STAMP MILLS AREA																			
Station Name	SB-05 (MDEQ 2013)				SB-06 (MDEQ 2013)				SB-07 (MDEQ 2013)						SB-08 (MDEQ 2013)				SB-12 (MDEQ 2013)			
Field Sample ID	E3PT4 & ME3PT4		SB-5		E3PT5 & ME3PT5		SB-6		E3PT6 & ME3PT6		E3PT6DL		SB-7		E3PT7 & ME3PT7		SB-8		E3PW1 & ME3PW1		SB-12	
Sample Date	09/11/13		09/11/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/11/13		09/11/13	
Sample Interval (bgs)	48 - 60 in		54 - 55 in		26 - 38 in		32 - 33 in		48 - 60 in		48 - 60 in		54 - 55 in		48 - 60 in		54 - 55 in		48 - 60 in		54 - 55 in	
Sample Description	Moist, reddish brown, medium sand.		Moist, reddish brown, medium sand.		Moist, reddish brown, medium sand.		Moist, reddish brown, medium sand.		Moist, blackish brown, medium sand.		Dilution Run		Moist, blackish brown, medium sand.		Moist, dark brown medium sand.		Moist, dark brown medium sand.		Moist, reddish brown, medium sand.		Moist, reddish brown, medium sand.	
	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	**3,440**	–	–	–	**1,030**	–	–	–	**8,910**	[4,11]	–	–	–	–	**4260**	–	–	–	**1060**	–	–	–
ANTIMONY	**0.33 J**	–	–	–	<4.9 U	–	–	–	**0.69 J**	–	–	–	–	–	**0.23 J**	–	–	–	**0.15 J**	–	–	–
ARSENIC	**6.2**	[2,4,11]	–	–	**1.4**	–	–	–	**7.9**	[2,4,10,11]	–	–	–	–	**3.7**	–	–	–	**1.1**	–	–	–
BARIUM	<16.1 UJ	–	–	–	<16.4 UJ	–	–	–	**29.4 J**	–	–	–	–	–	**30.6 J**	–	–	–	<14.8 UJ	–	–	–
BERYLLIUM	**0.27 J-**	–	–	–	<0.41 U	–	–	–	**0.39**	–	–	–	–	–	**0.38 J**	–	–	–	**0.12 J-**	–	–	–
CADMIUM	**0.12 J**	–	–	–	**0.036 J**	–	–	–	**0.43**	–	–	–	–	–	**0.097 J**	–	–	–	**0.038 J**	–	–	–
CALCIUM	**2,030**	–	–	–	**2,200**	–	–	–	**8,790**	–	–	–	–	–	**2,000**	–	–	–	**222 J**	–	–	–
CHROMIUM	**19**	–	–	–	**5.3**	–	–	–	**17.7**	–	–	–	–	–	**7.7**	–	–	–	**10.9**	–	–	–
COBALT	**3.6 J**	[2,4,11]	–	–	**0.83 J**	[4]	–	–	**11.2 J**	[2,4,11]	–	–	–	–	**2.9 J**	[2,4,11]	–	–	**0.83 J**	[4]	–	–
COPPER	**88**	[2]	–	–	**51.4**	[2]	–	–	**784**	[2]	–	–	–	–	**429**	[2]	–	–	**5.1**	–	–	–
IRON	**14,700**	[4,11]	–	–	**3,910**	–	–	–	**22,000**	[4,11]	–	–	–	–	**9,650**	–	–	–	**5,470**	–	–	–
LEAD	**4.1 J**	–	–	–	**1.5 J**	–	–	–	**45.4 J**	–	–	–	–	–	**15.4 J**	–	–	–	**0.92 J**	–	–	–
LITHIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MAGNESIUM	**1,820**	–	–	–	**669**	–	–	–	**5,810**	–	–	–	–	–	**1,480**	–	–	–	**435**	–	–	–
MANGANESE	**110**	–	–	–	**42.7**	–	–	–	**292**	–	–	–	–	–	**100**	–	–	–	**44.9**	–	–	–
MERCURY	**0.0083 J**	–	–	–	<0.093 U	–	–	–	**0.074 J**	–	–	–	–	–	**0.036 J**	–	–	–	<0.1 U	–	–	–
NICKEL	**10.1**	–	–	–	**3.2 J**	–	–	–	**19.2**	–	–	–	–	–	**7**	–	–	–	**3.7**	–	–	–
POTASSIUM	**553**	–	–	–	**19.4 J-**	–	–	–	**155 J**	–	–	–	–	–	**293 J**	–	–	–	**157 J**	–	–	–
SELENIUM	<2.8 U	–	–	–	<2.9 U	–	–	–	<2.7 U	–	–	–	–	–	**0.33 J**	–	–	–	<2.6 U	–	–	–
SILVER	**1.6**	[2]	–	–	**0.52 J**	–	–	–	**2.8**	[2]	–	–	–	–	**1.2**	[2]	–	–	**0.58 J**	–	–	–
SODIUM	**90.4 J**	–	–	–	**62.7 J**	–	–	–	**123 J**	–	–	–	–	–	**71.7 J**	–	–	–	**47 J**	–	–	–
THALLIUM	<2 U	–	–	–	<2 U	–	–	–	**1.9 R**	–	–	–	–	–	<1.9 U	–	–	–	<1.8 U	–	–	–
VANADIUM	**21.7**	–	–	–	**8.6**	–	–	–	**40**	–	–	–	–	–	**18.4**	–	–	–	**10.9**	–	–	–
ZINC	**19.6**	–	–	–	**7.1**	–	–	–	**42.9**	–	–	–	–	–	**16.5**	–	–	–	**5.2**	–	–	–
Inorganics - Cyanide (mg/kg)																						
CYANIDE	<0.54 U	–	–	–	<0.52 U	–	–	–	**0.33 J**	[2]	–	–	–	–	<0.56 U	–	–	–	<0.53 U	–	–	–
Organics - PCBs (ug/kg)																						
AROCLOR-1260	<35 U	–	–	–	<34 U	–	–	–	<35 UJ	–	–	–	–	–	<37 U	–	–	–	<36 U	–	–	–
AROCLOR-1262	<35 U	–	–	–	<34 U	–	–	–	<35 UJ	–	–	–	–	–	<37 U	–	–	–	<36 U	–	–	–
TOTAL PCBS	ND	–	–	–	ND	–	–	–	ND	–	–	–	–	–	ND	–	–	–	ND	–	–	–

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location								
Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria
Organics - SVOCs (ug/kg)								
1,1'-BIPHENYL	92-52-4	NA	NA	NA	NA	NA	NA	NA
2-METHYLNAPHTHALENE (SVOC)	91-57-6S	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07
ACENAPHTHENE	83-32-9	8,700	300,000	1.4E+10	4.1E+07	880,000	6.2E+09	1.3E+08
ACENAPHTHYLENE	208-96-8	ID	5,900	2.3E+09	1,600,000	17,000	1E+09	5,200,000
ACETOPHENONE	98-86-2	ID	30,000	3.3E+10	4.7E+07 (C)	88,000	1.4E+10	1.5E+08 (C)
ANTHRACENE	120-12-7	ID	41,000	6.7E+10	2.3E+08	41,000	2.9E+10	7.3E+08
BENZO(A)ANTHRACENE	56-55-3	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)
BENZO(A)PYRENE	50-32-8	NLL	NLL	1,500,000 (Q)	2,000 (Q)	NLL	1,900,000 (Q)	8,000 (Q)
BENZO(B)FLUORANTHENE	205-99-2	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)
BENZO(G,H,I)PERYLENE	191-24-2	NLL	NLL	8E+08 (Q)	2,500,000 (Q)	NLL	3.5E+08 (Q)	7,000,000 (Q)
BENZO(K)FLUORANTHENE	207-08-9	NLL	NLL	ID	200,000 (Q)	NLL	ID	800,000 (Q)
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	NLL	NLL	7E+08	2,800,000	NLL	8.9E+08	1.2E+07 (C)
CARBAZOLE	86-74-8	1,100	9,400	6.2E+07	530,000	39,000	7.8E+07	2,400,000
CHRYSENE	218-01-9	NLL	NLL	ID	2,000,000 (Q)	NLL	ID	8,000,000 (Q)
DIBENZO(A,H)ANTHRACENE	53-70-3	NLL	NLL	ID	2,000 (Q)	NLL	ID	8,000 (Q)
DIBENZOFURAN	132-64-9	1,700	ID	6,700,000	ID	ID	2,900,000	ID
DI-N-BUTYLPHTHALATE	84-74-2	11000	960,000	3.30E+09	2.70E+07	2.7E+6 (C)	1.50E+09	8.7E+7 (C)
FLUORANTHENE	206-44-0	5,500	730,000	9.3E+09	4.6E+07	730,000	4.1E+09	1.3E+08
FLUORENE	86-73-7	5,300	390,000	9.3E+09	2.7E+07	890,000	4.1E+09	8.7E+07
INDENO(1,2,3-CD)PYRENE	193-39-5	NLL	NLL	ID	20,000	NLL	ID	80,000
NAPHTHALENE (SVOC)	91-20-3S	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07
PHENANTHRENE	85-01-8	2,100	56,000	6,700,000	1,600,000	160,000	2,900,000	5,200,000
PYRENE	129-00-0	ID	480,000	6.7E+09	2.9E+07	480,000	2.9E+09	8.4E+07
Organics - VOCs (ug/kg)								
1,2,3-TRIMETHYLBENZENE	526-73-8	NA	NA	NA	NA	NA	NA	NA
1,2,4-TRIMETHYLBENZENE	95-63-6	570 (I)	2,100 (I)	8.2E+10 (I)	3.2E+07 (C,I)	2,100 (I)	3.6E+10 (I)	1E+08 (C,I)
1,3,5-TRIMETHYLBENZENE	108-67-8	1,100 (I)	1,800 (I)	8.2E+10 (I)	3.2E+07 (C,I)	1,800 (I)	3.6E+10 (I)	1E+08 (C,I)
2-METHYLNAPHTHALENE (VOC)	91-57-6V	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07
BENZENE	71-43-2	240 (I,X)	100 (I)	3.8E+08 (I)	180,000 (I)	100 (I)	4.7E+08 (I)	840,000 (C,I)
CYCLOHEXANE	110-82-7	NA	NA	NA	NA	NA	NA	NA
ETHYLBENZENE	100-41-4	360 (I)	1,500 (I)	1E+10 (I)	2.2E+07 (C,I)	1,500 (I)	1.3E+10 (I)	7.1E+07 (C, I)
HEXANE	110-54-3	NA	1.8E+05 (C)	1.30E+10	9.2E+07 (C)	5.1E+5 (C)	5.90E+09	3.0E+8 (C)

Geographic Location	QUINCY STAMP MILLS AREA																					
Station Name	SB-05 (MDEQ 2013)				SB-06 (MDEQ 2013)				SB-07 (MDEQ 2013)						SB-08 (MDEQ 2013)				SB-12 (MDEQ 2013)			
Field Sample ID	E3PT4 & ME3PT4		SB-5		E3PT5 & ME3PT5		SB-6		E3PT6 & ME3PT6		E3PT6DL		SB-7		E3PT7 & ME3PT7		SB-8		E3PW1 & ME3PW1		SB-12	
Sample Date	09/11/13		09/11/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/11/13		09/11/13	
Sample Interval (bgs)	48 - 60 in		54 - 55 in		26 - 38 in		32 - 33 in		48 - 60 in		48 - 60 in		54 - 55 in		48 - 60 in		54 - 55 in		48 - 60 in		54 - 55 in	
Sample Description	Moist, reddish brown, medium sand.		Moist, reddish brown, medium sand.		Moist, reddish brown, medium sand.		Moist, reddish brown, medium sand.		Moist, blackish brown, medium sand.		Dilution Run		Moist, blackish brown, medium sand.		Moist, dark brown medium sand.		Moist, dark brown medium sand.		Moist, reddish brown, medium sand.		Moist, reddish brown, medium sand.	
	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)																						
1,1'-BIPHENYL	<180 U	–	–	–	<180 U	–	–	–	1,600 J	–	<18000 U	–	–	–	<190 U	–	–	–	<190 U	–	–	–
2-METHYLNAPHTHALENE (SVOC)	<180 U	–	–	–	<180 U	–	–	–	5,000	[2]	4,900 J	[2]	–	–	<190 U	–	–	–	<190 U	–	–	–
ACENAPHTHENE	<180 U	–	–	–	<180 U	–	–	–	9,200	[2]	9,500 J	[2]	–	–	<190 U	–	–	–	<190 U	–	–	–
ACENAPHTHYLENE	<180 U	–	–	–	<180 U	–	–	–	710 J	–	<18000 U	–	–	–	<190 U	–	–	–	<190 U	–	–	–
ACETOPHENONE	<180 U	–	–	–	<180 U	–	–	–	<1800 U	–	<18000 U	–	–	–	<190 U	–	–	–	<190 U	–	–	–
ANTHRACENE	<180 U	–	–	–	<180 U	–	–	–	25,000	–	23,000	–	–	–	<190 U	–	–	–	<190 U	–	–	–
BENZO(A)ANTHRACENE	<180 U	–	–	–	<180 U	–	–	–	57,000 J	[10]	52,000	[10]	–	–	46 J	–	–	–	<190 U	–	–	–
BENZO(A)PYRENE	<180 U	–	–	–	<180 U	–	–	–	37,000 J	[10,17]	34,000	[10,17]	–	–	53 J	–	–	–	<190 U	–	–	–
BENZO(B)FLUORANTHENE	<180 U	–	–	–	<180 U	–	–	–	41,000 J	[10]	36,000	[10]	–	–	62 J	–	–	–	<190 U	–	–	–
BENZO(G,H,I)PERYLENE	<180 U	–	–	–	<180 U	–	–	–	21,000	–	19,000	–	–	–	48 J	–	–	–	<190 U	–	–	–
BENZO(K)FLUORANTHENE	<180 U	–	–	–	<180 U	–	–	–	14,000	–	14,000 J	–	–	–	<190 U	–	–	–	<190 U	–	–	–
BIS(2-ETHYLHEXYL)PHTHALATE	<180 U	–	–	–	55 J	–	–	–	<1800 U	–	<18000 U	–	–	–	43 J	–	–	–	54 J	–	–	–
CARBAZOLE	<180 U	–	–	–	<180 U	–	–	–	370 J	–	<18000 U	–	–	–	<190 U	–	–	–	<190 U	–	–	–
CHRYSENE	<180 U	–	–	–	<180 U	–	–	–	60,000 J	–	62,000	–	–	–	57 J	–	–	–	<190 U	–	–	–
DIBENZO(A,H)ANTHRACENE	<180 U	–	–	–	<180 U	–	–	–	6,600	[10]	5,300 J	[10]	–	–	<190 U	–	–	–	<190 U	–	–	–
DIBENZOFURAN	<180 U	–	–	–	<180 U	–	–	–	<1800 U	–	<18000 U	–	–	–	<190 U	–	–	–	<190 U	–	–	–
DI-N-BUTYLPHTHALATE	79 J	–	–	–	70 J	–	–	–	<1800 U	–	<18000 U	–	–	–	97 J	–	–	–	64 J	–	–	–
FLUORANTHENE	<180 U	–	–	–	<180 U	–	–	–	94,000 J	[2]	87,000	[2]	–	–	86 J	–	–	–	<190 U	–	–	–
FLUORENE	<180 U	–	–	–	<180 U	–	–	–	10,000	[2]	9,500 J	[2]	–	–	<190 U	–	–	–	<190 U	–	–	–
INDENO(1,2,3-CD)PYRENE	<180 U	–	–	–	<180 U	–	–	–	17,000	–	14,000 J	–	–	–	<190 U	–	–	–	<190 U	–	–	–
NAPHTHALENE (SVOC)	<180 U	–	–	–	<180 U	–	–	–	3,400	[2]	3,700 J	[2]	–	–	<190 U	–	–	–	<190 U	–	–	–
PHENANTHRENE	<180 U	–	–	–	<180 U	–	–	–	140,000 J	[2,4]	120,000	[2,4]	–	–	75 J	–	–	–	<190 U	–	–	–
PYRENE	<180 U	–	–	–	<180 U	–	–	–	150,000 J	–	140,000	–	–	–	120 J	–	–	–	<190 U	–	–	–
Organics - VOCs (ug/kg)																						
1,2,3-TRIMETHYLBENZENE	–	–	<81 U	–	–	–	<90 U	–	–	–	–	–	<75 U	–	–	–	<72 U	–	–	–	<68 U	–
1,2,4-TRIMETHYLBENZENE	–	–	<81 U	–	–	–	<90 U	–	–	–	–	–	110	–	–	–	<72 U	–	–	–	<68 U	–
1,3,5-TRIMETHYLBENZENE	–	–	<81 U	–	–	–	<90 U	–	–	–	–	–	<75 U	–	–	–	<72 U	–	–	–	<68 U	–
2-METHYLNAPHTHALENE (VOC)	–	–	<410 U	–	–	–	<450 UJ	–	–	–	–	–	<370 UJ	–	–	–	400	–	–	–	<340 UJ	–
BENZENE	–	–	<81 U	–	–	–	<90 U	–	–	–	–	–	<75 U	–	–	–	<72 U	–	–	–	<68 U	–
CYCLOHEXANE	–	–	<410 U	–	–	–	<450 U	–	–	–	–	–	<370 U	–	–	–	<360 U	–	–	–	<340 U	–
ETHYLBENZENE	–	–	<81 U	–	–	–	<90 U	–	–	–	–	–	<75 U	–	–	–	<72 U	–	–	–	<68 U	–
HEXANE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY STAMP MILLS AREA																					
Station Name	CAS Number								SB-05 (MDEQ 2013)				SB-06 (MDEQ 2013)				SB-07 (MDEQ 2013)						SB-08 (MDEQ 2013)				SB-12 (MDEQ 2013)			
Field Sample ID		[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	E3PT4 & ME3PT4		SB-5		E3PT5 & ME3PT5		SB-6		E3PT6 & ME3PT6		E3PT6DL		SB-7		E3PT7 & ME3PT7		SB-8		E3PW1 & ME3PW1		SB-12	
Sample Date									09/11/13		09/11/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/11/13		09/11/13	
Sample Interval (bgs)									48 - 60 in		54 - 55 in		26 - 38 in		32 - 33 in		48 - 60 in		48 - 60 in		54 - 55 in		48 - 60 in		54 - 55 in		48 - 60 in		54 - 55 in	
Sample Description									Moist, reddish brown, medium sand.		Moist, reddish brown, medium sand.		Moist, reddish brown, medium sand.		Moist, reddish brown, medium sand.		Moist, blackish brown, medium sand.		Dilution Run		Moist, blackish brown, medium sand.		Moist, dark brown medium sand.		Moist, dark brown medium sand.		Moist, reddish brown, medium sand.		Moist, reddish brown, medium sand.	
									Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Organics - VOCs (ug/kg) (continued)																														
ISOPROPYLBENZENE	98-82-8	3,200	91,000	5.8E+09	2.5E+07 (C)	260,000	2.6E+09	8E+07 (C)	--	--	<81 U	--	--	--	<90 U	--	--	--	--	--	<75 U	--	--	--	<72 U	--	--	--	<68 U	--
M,P-XYLENE	1330-20-7	NA	NA	NA	NA	NA	NA	NA	--	--	<160 U	--	--	--	<180 U	--	--	--	--	--	**150**	--	--	--	<140 U	--	--	--	<140 U	--
METHYLENE CHLORIDE	75-09-2	30,000 (X)	100	6.60E+09	1.30E+06	100	8.30E+09	5.8E+6 (C)	--	--	<410 U	--	--	--	<450 U	--	--	--	--	--	<370 U	--	--	--	<360 U	--	--	--	<340 U	--
NAPHTHALENE (VOC)	91-20-3V	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	--	--	<410 U	--	--	--	<450 U	--	--	--	--	--	<370 U	--	--	--	<360 U	--	--	--	<340 U	--
N-BUTYLBENZENE	104-51-8	ID	1,600	2E+09	2,500,000	4,600	8.8E+08	8,000,000	--	--	<81 U	--	--	--	<90 U	--	--	--	--	--	<75 U	--	--	--	<72 U	--	--	--	<68 U	--
N-PROPYLBENZENE	103-65-1	ID	1,600 (I)	1.3E+09 (I)	2,500,000 (I)	4,600 (I)	5.9E+08 (I)	8,000,000 (I)	--	--	<81 U	--	--	--	<90 U	--	--	--	--	--	<75 U	--	--	--	<72 U	--	--	--	<68 U	--
O-XYLENE	95-47-6	NA	NA	NA	NA	NA	NA	NA	--	--	<81 U	--	--	--	<90 U	--	--	--	--	--	**99**	--	--	--	<72 U	--	--	--	<68 U	--
P-ISOPROPYL TOLUENE (p-CYMENE)	99-87-6	NA	NA	NA	NA	NA	NA	NA	--	--	<81 U	--	--	--	<90 U	--	--	--	--	--	<75 U	--	--	--	<72 U	--	--	--	<68 U	--
SEC-BUTYLBENZENE	135-98-8	ID	1,600	4.00E+08	2.50E+06	1,600	1.80E+08	8.00E+06	--	--	<81 U	--	--	--	<90 U	--	--	--	--	--	<75 U	--	--	--	<72 U	--	--	--	<68 U	--
TOLUENE	108-88-3	5,400 (I)	16,000 (I)	2.7E+10 (I)	5E+07 (C,I)	16,000 (I)	1.2E+10 (I)	1.6E+08 (C,I)	--	--	<81 U	--	--	--	<90 U	--	--	--	--	--	**120**	--	--	--	<72 U	--	--	--	<68 U	--
XYLENE - TOTAL	1330-20-7	820 (I)	5,600 (I)	2.9E+11 (I)	4.1E+08 (C,I)	5600 (I)	1.3E+11 (I)	1E+09 (I)	--	--	ND	--	--	--	ND	--	--	--	--	--	**249**	--	--	--	ND	--	--	--	ND	--
Organics - Pesticides (ug/kg)																														
4,4'-DDD	72-54-8	NLL	NLL	4.40E+07	95,000	NLL	5.60E+07	4.00E+05	<3.5 U	--	--	--	<3.4 U	--	--	--	**220**	--	--	--	--	--	<3.6 U	--	--	--	<3.7 U	--	--	--
4,4'-DDE	72-55-9	NLL	NLL	3.20E+07	45,000	NLL	4.00E+07	1.90E+05	<3.5 U	--	--	--	<3.4 U	--	--	--	<36 U	--	--	--	--	--	<3.6 U	--	--	--	<3.7 U	--	--	--
4,4'-DDT	50-29-3	NLL	NLL	3.20E+07	57,000	NLL	4.00E+07	2.80E+05	<3.5 U	--	--	--	<3.4 U	--	--	--	**57 J**	--	--	--	--	--	<3.6 U	--	--	--	<3.7 U	--	--	--
ALDRIN	309-00-2	NLL	NLL	6.40E+05	1,000	NLL	8.00E+05	4,300	<1.8 U	--	--	--	<1.8 U	--	--	--	<18 U	--	--	--	--	--	<1.9 U	--	--	--	<1.9 U	--	--	--
ALPHA-BHC	319-84-6	ID	18	1.70E+06	2,600	71	2.10E+06	12,000	<1.8 U	--	--	--	<1.8 U	--	--	--	<18 U	--	--	--	--	--	<1.9 U	--	--	--	<1.9 U	--	--	--
ALPHA-CHLORODANE	5103-71-9	NA	NA	NA	NA	NA	NA	NA	<1.8 U	--	--	--	<1.8 U	--	--	--	<18 U	--	--	--	--	--	<1.9 U	--	--	--	<1.9 U	--	--	--
BETA-BHC	319-85-7	ID	37	5.90E+06	5,400	150	7.40E+06	25,000	<1.8 U	--	--	--	<1.8 U	--	--	--	<18 U	--	--	--	--	--	<1.9 U	--	--	--	<1.9 U	--	--	--
DIELDRIN	60-57-1	NLL	NLL	6.80E+05	1,100	NLL	8.50E+05	4,700	<3.5 U	--	--	--	<3.4 U	--	--	--	<36 U	--	--	--	--	--	<3.6 U	--	--	--	<3.7 U	--	--	--
ENDOSULFAN I	959-98-8	NA	NA	NA	NA	NA	NA	NA	<1.8 U	--	--	--	<1.8 U	--	--	--	<18 U	--	--	--	--	--	<1.9 U	--	--	--	<1.9 U	--	--	--
ENDOSULFAN II	33213-65-9	NA	NA	NA	NA	NA	NA	NA	<3.5 U	--	--	--	<3.4 U	--	--	--	<36 U	--	--	--	--	--	<3.6 U	--	--	--	<3.7 U	--	--	--
ENDOSULFAN SULFATE	1031-07-8	NA	NA	NA	NA	NA	NA	NA	<3.5 U	--	--	--	<3.4 U	--	--	--	**120 J**	--	--	--	--	--	<3.6 U	--	--	--	<3.7 U	--	--	--
ENDRIN	72-20-8	NLL	NLL	ID	65,000	NLL	ID	1.90E+05	<3.5 U	--	--	--	<3.4 U	--	--	--	**85 J**	--	--	--	--	--	<3.6 U	--	--	--	<3.7 U	--	--	--
ENDRIN ALDEHYDE	7421-93-4	NA	NA	NA	NA	NA	NA	NA	<3.5 U	--	--	--	<3.4 U	--	--	--	<36 U	--	--	--	--	--	<3.6 U	--	--	--	<3.7 U	--	--	--
ENDRIN KETONE	53494-70-5	NA	NA	NA	NA	NA	NA	NA	<3.5 U	--	--	--	<3.4 U	--	--	--	**120 J**	--	--	--	--	--	<3.6 U	--	--	--	<3.7 U	--	--	--
GAMMA-CHLORDANE	5103-74-2	NA	NA	NA	NA	NA	NA	NA	<1.8 U	--	--	--	<1.8 U	--	--	--	<18 U	--	--	--	--	--	<1.9 U	--	--	--	<1.9 U	--	--	--
HEPTACHLOR EPOXIDE	102-457-3	NLL	NLL	1.20E+06	3,100	NLL	1.50E+06	9,500	<1.8 U	--	--	--	<1.8 U	--	--	--	**45 J**	--	--	--	--	--	<1.9 U	--	--	--	<1.9 U	--	--	--
METHOXYCHLOR	72-43-5	NA	16,000	ID	1.90E+06	16,000	ID	5.60E+06	<18 U	--	--	--	<18 U	--	--	--	<180 U	--	--	--	--	--	<19 U	--	--	--	<19 U	--	--	--
Asbestos (%)																														
ASBESTOS	ASB	NLL	NLL	1% (1.0E+7 (M); 68,000 ppb)	ID	NLL	1% (1.0E+7 (M); 85,000 ppb)	ID	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

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

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY STAMP MILLS AREA																							
Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	SB-13 (MDEQ 2013)				SB-14 (MDEQ 2013)				SS-06 (MDEQ 2013)				SS-07 (MDEQ 2013)				SS-08 (MDEQ 2013)				SS-09 (MDEQ 2013)			
Field Sample ID									E3PW2 & ME3PW2		SB-13		E3PW3 & ME3PW3		SB-14		E3PR7 & ME3PR7		SS-6		E3PR8 & ME3PR8		SS-7		E3PR9 & ME3PR9		SS-8		E3PS0 & ME3PS0		SS-9	
Sample Date									09/11/13		09/11/13		09/11/13		09/11/13		09/11/13		09/11/13		09/11/13		09/11/13		09/11/13		09/11/13		09/12/13		09/12/13	
Sample Interval (bgs)									20 - 32 in		26 - 27 in		21 - 33 in		27 - 28 in		0 - 6 in		6 - 6 in		0 - 3 in		3 - 3 in		0 - 8 in		6 - 6 in		0 - 6 in		4 - 4 in	
Sample Description									Moist, reddish brown, medium sand.		Moist, reddish brown, medium sand.		Moist, reddish brown sand with gravel.		Moist, reddish brown sand with gravel.		Moist, blackish brown with gray, fine to medium sand with brick and mortar debris and metal		Moist, blackish brown with gray, fine to medium sand with brick and mortar debris and metal		Moist, blackish brown, medium sand with silt, gravel, and coal		Moist, blackish brown, medium sand with silt, gravel, and coal		Moist, blackish brown, silt and fine sand with some coal		Moist, blackish brown, silt and fine sand with some coal		Moist, brown, silty sand and gravel.		Moist, brown, silty sand and 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
Inorganics - Metals (mg/kg)																																
ALUMINUM	7429-90-5	NA	6,900 (B)	ID	50,000 (DD)	6,900 (B)	ID	370,000 (DD)	3,750	–	–	–	5,840	–	–	–	10,400	[4,11]	–	–	6,360	–	–	–	10,900	[4,11]	–	–	8,870	[4,11]	–	–
ANTIMONY	7440-36-0	1.2 (X)	4.3	13,000	180	4.3	5,900	670	0.34 J	–	–	–	0.62 J	–	–	–	2.4 J	[2]	–	–	0.71 J	–	–	–	1.4 J	[2]	–	–	37.6 J	[2,4,11]	–	–
ARSENIC	7440-38-2	4.6	4.6	720	7.6	4.6	910	37	1.9	–	–	–	4.2	–	–	–	81.8	[2,4,10,11,17]	–	–	8.2	[2,4,10,11]	–	–	14	[2,4,10,11]	–	–	5.8	[2,4,11]	–	–
BARIUM	7440-39-3	130	1,300 (G)	330,000	37,000	1,300	150,000	130,000	<16.2 UJ	–	–	–	38.9 J	–	–	–	55.6 J-	–	–	–	19.8 J-	–	–	–	96.5 J-	–	–	–	74.4 J-	–	–	–
BERYLLIUM	7440-41-7	4.6 (G)	51	1,300	410	51	590	1,600	0.35 J	–	–	–	0.34 J-	–	–	–	0.33 J-	–	–	–	0.3 J-	–	–	–	0.51	–	–	–	0.37 J	–	–	–
CADMIUM	7440-43-9	1.6 (G,X)	6.0	1,700	550	6.0	2,200	2,100	0.08 J	–	–	–	0.18 J	–	–	–	1.6 J	–	–	–	0.24 J	–	–	–	1 J	–	–	–	0.74 J	–	–	–
CALCIUM	7440-70-2	NA	NA	NA	NA	NA	NA	NA	923	–	–	–	3,080	–	–	–	23,500	–	–	–	6,730	–	–	–	11,000	–	–	–	10,300	–	–	–
CHROMIUM	7440-47-3	1,200,000 (G,H,X)	1,000,000 (D,H)	330,000 (H)	790,000 (H)	1,000,000 (D,H)	150,000 (H)	1,000,000 (D,H)	8.1	–	–	–	11.8	–	–	–	32.7 J	–	–	–	10.9 J	–	–	–	18.6 J	–	–	–	17.2 J	–	–	–
COBALT	7440-48-4	2.0	0.8	13,000	2,600	2.0	5,900	9,000	4.1 J	[2,4,11]	–	–	4.7 J	[2,4,11]	–	–	12.3 J	[2,4,11]	–	–	7.3 J	[2,4,11]	–	–	12.4 J	[2,4,11]	–	–	11 J	[2,4,11]	–	–
COPPER	7440-50-8	32 (G)	5,800	130,000	20,000	5,800	59,000	73,000	34.6	[2]	–	–	148	[2]	–	–	451	[2]	–	–	1,010	[2]	–	–	1,230	[2]	–	–	4,620	[2]	–	–
IRON	7439-89-6	NA	12,000 (B)	ID	160,000	12,000 (B)	ID	580,000	9,220	–	–	–	14,400	[4,11]	–	–	81,600	[4,11]	–	–	17,400	[4,11]	–	–	32,900	[4,11]	–	–	26,900	[4,11]	–	–
LEAD	7439-92-1	1,900 (G,X)	700	100,000	400	700	44,000	900 (DD)	1.8 J	–	–	–	3.7 J	–	–	–	62.2	–	–	–	11.3	–	–	–	777	[4,10,11]	–	–	869	[4,10,11]	–	–
LITHIUM	7439-93-2	9.8 (B)	9.8 (B)	2,300,000	4,200 (DD)	9.8 (B)	1,000,000	31,000 (DD)	–	–	–	–	–		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MAGNESIUM	7439-95-4	NA	8,000	6,700,000	1,000,000 (D)	22,000	2,900,000	1,000,000 (D)	1,570	–	–	–	2,420	–	–	–	10,500	[4]	–	–	4,040	–	–	–	6,410	–	–	–	6,170	–	–	–
MANGANESE	7439-96-5	440 (B,G,X)	440 (B)	3,300	25,000	440 (B)	1,500	90,000	94.5	–	–	–	110	–	–	–	508	[2,4,11]	–	–	205	–	–	–	404	–	–	–	346	–	–	–
MERCURY	7439-97-6	0.13 (B, Z)	1.7 (Z)	20000 (Z)	160 (Z)	1.7 (Z)	8800 (Z)	580 (Z)	0.015 J	–	–	–	0.013 J	–	–	–	0.066 J	–	–	–	0.099 J	–	–	–	0.99	[2]	–	–	0.26	[2]	–	–
NICKEL	7440-02-0	29 (G)	100	13,000	40,000	100	16,000	150,000	7.6	–	–	–	11.5	–	–	–	52.5 J	[2]	–	–	12.3 J	–	–	–	19.4 J	–	–	–	20.4 J	–	–	–
POTASSIUM	7440-09-7	NA	NA	NA	NA	NA	NA	NA	241 J	–	–	–	525 J	–	–	–	690	–	–	–	<435 U	–	–	–	174 J-	–	–	–	192 J	–	–	–
SELENIUM	7782-49-2	0.41 (B)	4.0	130,000	2,600	4.0	59,000	9,600	<2.8 U	–	–	–	<3.7 U	–	–	–	<3.4 UJ	–	–	–	<3 UJ	–	–	–	<3.1 UJ	–	–	–	<3.1 UJ	–	–	–
SILVER	7440-22-4	1.0 (M); 0.027	4.5	6,700	2,500	13	2,900	9,000	1	–	–	–	1.7	[2]	–	–	8.7 J+	[2,4]	–	–	2.7 J+	[2]	–	–	4.2 J+	[2]	–	–	7.9 J+	[2,4]	–	–
SODIUM	7440-23-5	NA	NA	NA	NA	NA	NA	NA	62.8 J	–	–	–	133 J	–	–	–	468 J	–	–	–	96 J	–	–	–	162 J	–	–	–	191 J	–	–	–
THALLIUM	7440-28-0	1.4	2.3	13,000	35	2.3	5,900	130	<2 U	–	–	–	<2.6 U	–	–	–	<24 UJ	–	–	–	<2.2 UJ	–	–	–	R	–	–	–	<21.8 UJ	–	–	–
VANADIUM	7440-62-2	430	72	ID	750 (DD)	990	ID	5,500 (DD)	19.1	–	–	–	30.3	–	–	–	41.6	–	–	–	34.6	–	–	–	47.7	–	–	–	43.4	–	–	–
ZINC	7440-66-6	62 (G)	2,400	ID	170,000	5,000	ID	630,000	15	–	–	–	31.2	–	–	–	163	[2]	–	–	29.1	–	–	–	350	[2]	–	–	301	[2]	–	–
Inorganics - Cyanide (mg/kg)																																
CYANIDE	57-12-5	0.1 (P,R)	4.0 (P,R)	250 (P,R)	12 (P,R)	4.0 (P,R)	250 (P,R)	250 (P,R)	<0.53 U	–	–	–	1.8	[2]	–	–	<0.63 U	–	–	–	<0.55 U	–	–	–	0.19 J	[2]	–	–	0.22 J	[2]	–	–
Organics - PCBs (ug/kg)																																
AROCLOR-1260	11096-82-5	NA	NA	NA	NA	NA	NA	NA	<35 U	–	–	–	<47 U	–	–	–	<41 U	–	–	–	<36 U	–	–	–	<38 U	–	–	–	<37 U	–	–	–
AROCLOR-1262	37324-23-5	NA	NA	NA	NA	NA	NA	NA	<35 U	–	–	–	<47 U	–	–	–	<41 U	–	–	–	<36 U	–	–	–	<38 U	–	–	–	<37 U	–	–	–
TOTAL PCBS	TPCB	NLL	NLL	5,200,000 (J)	1,000 (J,T)	NLL	6,500,000 (J)	1,000 (J,T)	ND	–	–	–	ND	–	–	–	ND	–	–	–	ND	–	–	–	ND	–	–	–	ND	–	–	–

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY STAMP MILLS AREA																							
Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	SB-13 (MDEQ 2013)				SB-14 (MDEQ 2013)				SS-06 (MDEQ 2013)				SS-07 (MDEQ 2013)				SS-08 (MDEQ 2013)				SS-09 (MDEQ 2013)			
Field Sample ID									E3PW2 & ME3PW2		SB-13		E3PW3 & ME3PW3		SB-14		E3PR7 & ME3PR7		SS-6		E3PR8 & ME3PR8		SS-7		E3PR9 & ME3PR9		SS-8		E3PS0 & ME3PS0		SS-9	
Sample Date									09/11/13		09/11/13		09/11/13		09/11/13		09/11/13		09/11/13		09/11/13		09/11/13		09/11/13		09/11/13		09/12/13		09/12/13	
Sample Interval (bgs)									20 - 32 in		26 - 27 in		21 - 33 in		27 - 28 in		0 - 6 in		6 - 6 in		0 - 3 in		3 - 3 in		0 - 8 in		6 - 6 in		0 - 6 in		4 - 4 in	
Sample Description									Moist, reddish brown, medium sand.		Moist, reddish brown, medium sand.		Moist, reddish brown sand with gravel.		Moist, reddish brown sand with gravel.		Moist, blackish brown with gray, fine to medium sand with brick and mortar debris and metal		Moist, blackish brown with gray, fine to medium sand with brick and mortar debris and metal		Moist, blackish brown, medium sand with silt, gravel, and coal		Moist, blackish brown, medium sand with silt, gravel, and coal		Moist, blackish brown, silt and fine sand with some coal		Moist, blackish brown, silt and fine sand with some coal		Moist, brown, silty sand and gravel.		Moist, brown, silty sand and 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
Organics - SVOCs (ug/kg)																																
1,1'-BIPHENYL	92-52-4	NA	NA	NA	NA	NA	NA	NA	<180 U	–	–	–	<240 U	–	–	–	57 J	–	–	–	<1800 U	–	–	–	<2000 U	–	–	–	<190 U	–	–	–
2-METHYLNAPHTHALENE (SVOC)	91-57-6S	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07	<180 U	–	–	–	<240 U	–	–	–	440	–	–	–	<1800 U	–	–	–	920 J	–	–	–	44 J	–	–	–
ACENAPHTHENE	83-32-9	8,700	300,000	1.4E+10	4.1E+07	880,000	6.2E+09	1.3E+08	<180 U	–	–	–	<240 U	–	–	–	<210 U	–	–	–	<1800 U	–	–	–	740 J	–	–	–	57 J	–	–	–
ACENAPHTHYLENE	208-96-8	ID	5,900	2.3E+09	1,600,000	17,000	1E+09	5,200,000	<180 U	–	–	–	<240 U	–	–	–	<210 U	–	–	–	<1800 U	–	–	–	<2000 U	–	–	–	59 J	–	–	–
ACETOPHENONE	98-86-2	ID	30,000	3.3E+10	4.7E+07 (C)	88,000	1.4E+10	1.5E+08 (C)	<180 U	–	–	–	<240 U	–	–	–	180 J	–	–	–	<1800 U	–	–	–	<2000 U	–	–	–	81 J	–	–	–
ANTHRACENE	120-12-7	ID	41,000	6.7E+10	2.3E+08	41,000	2.9E+10	7.3E+08	<180 U	–	–	–	<240 U	–	–	–	<210 U	–	–	–	740 J	–	–	–	2,600	–	–	–	120 J	–	–	–
BENZO(A)ANTHRACENE	56-55-3	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)	<180 U	–	–	–	88 J	–	–	–	62 J	–	–	–	2,900	–	–	–	9,100	–	–	–	430	–	–	–
BENZO(A)PYRENE	50-32-8	NLL	NLL	1,500,000 (Q)	2,000 (Q)	NLL	1,900,000 (Q)	8,000 (Q)	<180 U	–	–	–	61 J	–	–	–	<210 U	–	–	–	2,100	[10]	–	–	5,500	[10]	–	–	380	–	–	–
BENZO(B)FLUORANTHENE	205-99-2	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)	<180 U	–	–	–	75 J	–	–	–	61 J	–	–	–	2,500	–	–	–	8,300	–	–	–	630	–	–	–
BENZO(G,H,I)PERYLENE	191-24-2	NLL	NLL	8E+08 (Q)	2,500,000 (Q)	NLL	3.5E+08 (Q)	7,000,000 (Q)	<180 U	–	–	–	<240 U	–	–	–	46 J	–	–	–	1,500 J	–	–	–	3,500	–	–	–	290	–	–	–
BENZO(K)FLUORANTHENE	207-08-9	NLL	NLL	ID	200,000 (Q)	NLL	ID	800,000 (Q)	<180 U	–	–	–	<240 U	–	–	–	44 J	–	–	–	1,600 J	–	–	–	4,900	–	–	–	270	–	–	–
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	NLL	NLL	7E+08	2,800,000	NLL	8.9E+08	1.2E+07 (C)	46 J	–	–	–	67 J	–	–	–	140 J	–	–	–	<1800 U	–	–	–	<2000 U	–	–	–	<190 U	–	–	–
CARBAZOLE	86-74-8	1,100	9,400	6.2E+07	530,000	39,000	7.8E+07	2,400,000	<180 U	–	–	–	<240 U	–	–	–	<210 U	–	–	–	<1800 U	–	–	–	<2000 U	–	–	–	110 J	–	–	–
CHRYSENE	218-01-9	NLL	NLL	ID	2,000,000 (Q)	NLL	ID	8,000,000 (Q)	<180 U	–	–	–	110 J	–	–	–	110 J	–	–	–	3,800	–	–	–	12,000	–	–	–	520	–	–	–
DIBENZO(A,H)ANTHRACENE	53-70-3	NLL	NLL	ID	2,000 (Q)	NLL	ID	8,000 (Q)	<180 U	–	–	–	<240 U	–	–	–	<210 U	–	–	–	450 J	–	–	–	910 J	–	–	–	93 J	–	–	–
DIBENZOFURAN	132-64-9	1,700	ID	6,700,000	ID	ID	2,900,000	ID	<180 U	–	–	–	<240 U	–	–	–	190 J	–	–	–	<1800 U	–	–	–	<2000 U	–	–	–	63 J	–	–	–
DI-N-BUTYLPHTHALATE	84-74-2	11000	960,000	3.30E+09	2.70E+07	2.7E+6 (C)	1.50E+09	8.7E+7 (C)	89 J	–	–	–	140 J	–	–	–	120 J	–	–	–	<1800 U	–	–	–	<2000 U	–	–	–	140 J	–	–	–
FLUORANTHENE	206-44-0	5,500	730,000	9.3E+09	4.6E+07	730,000	4.1E+09	1.3E+08	<180 U	–	–	–	130 J	–	–	–	87 J	–	–	–	5,200	–	–	–	15,000	[2]	–	–	960	–	–	–
FLUORENE	86-73-7	5,300	390,000	9.3E+09	2.7E+07	890,000	4.1E+09	8.7E+07	<180 U	–	–	–	<240 U	–	–	–	<210 U	–	–	–	<1800 U	–	–	–	810 J	–	–	–	51 J	–	–	–
INDENO(1,2,3-CD)PYRENE	193-39-5	NLL	NLL	ID	20,000	NLL	ID	80,000	<180 U	–	–	–	<240 U	–	–	–	<210 U	–	–	–	1,200 J	–	–	–	2600	–	–	–	300	–	–	–
NAPHTHALENE (SVOC)	91-20-3S	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	<180 U	–	–	–	<240 U	–	–	–	380	–	–	–	<1800 U	–	–	–	630 J	–	–	–	43 J	–	–	–
PHENANTHRENE	85-01-8	2,100	56,000	6,700,000	1,600,000	160,000	2,900,000	5,200,000	<180 U	–	–	–	100 J	–	–	–	380	–	–	–	4,500	[2]	–	–	17,000	[2]	–	–	880	–	–	–
PYRENE	129-00-0	ID	480,000	6.7E+09	2.9E+07	480,000	2.9E+09	8.4E+07	<180 U	–	–	–	210 J	–	–	–	88 J	–	–	–	8,200	–	–	–	25000	–	–	–	800	–	–	–
Organics - VOCs (ug/kg)																																
1,2,3-TRIMETHYLBENZENE	526-73-8	NA	NA	NA	NA	NA	NA	NA	–	–	<75 U	–	–	–	<95 U	–	–	–	130	–	–	–	230	–	–	–	440 J	–	–	–	<57 U	–
1,2,4-TRIMETHYLBENZENE	95-63-6	570 (I)	2,100 (I)	8.2E+10 (I)	3.2E+07 (C,I)	2,100 (I)	3.6E+10 (I)	1E+08 (C,I)	–	–	<75 U	–	–	–	<95 U	–	–	–	230	–	–	–	740	[2]	–	–	1,100 J	[2]	–	–	<57 U	–
1,3,5-TRIMETHYLBENZENE	108-67-8	1,100 (I)	1,800 (I)	8.2E+10 (I)	3.2E+07 (C,I)	1,800 (I)	3.6E+10 (I)	1E+08 (C,I)	–	–	<75 U	–	–	–	<95 U	–	–	–	87	–	–	–	140	–	–	–	230 J	–	–	–	<57 U	–
2-METHYLNAPHTHALENE (VOC)	91-57-6V	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07	–	–	<370 UJ	–	–	–	<480 UJ	–	–	–	460	–	–	–	1,100	–	–	–	2,600 J	–	–	–	<280 U	–
BENZENE	71-43-2	240 (I,X)	100 (I)	3.8E+08 (I)	180,000 (I)	100 (I)	4.7E+08 (I)	840,000 (C,I)	–	–	<75 U	–	–	–	<95 U	–	–	–	<64 U	–	–	–	1,700	[2,4,5,11]	–	–	290 J	[2,4,11]	–	–	<57 U	–
CYCLOHEXANE	110-82-7	NA	NA	NA	NA	NA	NA	NA	–	–	<370 U	–	–	–	<480 U	–	–	–	680	–	–	–	1,000	–	–	–	1,500 J	–	–	–	<280 U	–
ETHYLBENZENE	100-41-4	360 (I)	1,500 (I)	1E+10 (I)	2.2E+07 (C,I)	1,500 (I)	1.3E+10 (I)	7.1E+07 (C, I)	–	–	<75 U	–	–	–	<95 U	–	–	–	<64 U	–	–	–	380	[2]	–	–	360 J	–	–	–	<57 U	–
HEXANE	110-54-3	NA	1.8E+05 (C)	1.30E+10	9.2E+07 (C)	5.1E+5 (C)	5.90E+09	3.0E+8 (C)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY STAMP MILLS AREA																							
Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	SB-13 (MDEQ 2013)				SB-14 (MDEQ 2013)				SS-06 (MDEQ 2013)				SS-07 (MDEQ 2013)				SS-08 (MDEQ 2013)				SS-09 (MDEQ 2013)			
Field Sample ID									E3PW2 & ME3PW2		SB-13		E3PW3 & ME3PW3		SB-14		E3PR7 & ME3PR7		SS-6		E3PR8 & ME3PR8		SS-7		E3PR9 & ME3PR9		SS-8		E3PS0 & ME3PS0		SS-9	
Sample Date									09/11/13		09/11/13		09/11/13		09/11/13		09/11/13		09/11/13		09/11/13		09/11/13		09/11/13		09/11/13		09/12/13		09/12/13	
Sample Interval (bgs)									20 - 32 in		26 - 27 in		21 - 33 in		27 - 28 in		0 - 6 in		6 - 6 in		0 - 3 in		3 - 3 in		0 - 8 in		6 - 6 in		0 - 6 in		4 - 4 in	
Sample Description									Moist, reddish brown, medium sand.		Moist, reddish brown, medium sand.		Moist, reddish brown sand with gravel.		Moist, reddish brown sand with gravel.		Moist, blackish brown with gray, fine to medium sand with brick and mortar debris and metal		Moist, blackish brown with gray, fine to medium sand with brick and mortar debris and metal		Moist, blackish brown, medium sand with silt, gravel, and coal		Moist, blackish brown, medium sand with silt, gravel, and coal		Moist, blackish brown, silt and fine sand with some coal		Moist, blackish brown, silt and fine sand with some coal		Moist, brown, silty sand and gravel.		Moist, brown, silty sand and 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
Organics - VOCs (ug/kg) (continued)																																
ISOPROPYLBENZENE	98-82-8	3,200	91,000	5.8E+09	2.5E+07 (C)	260,000	2.6E+09	8E+07 (C)	–	–	<75 U	–	–	–	<95 U	–	–	–	<64 U	–	–	–	**100**	–	–	–	**270 J**	–	–	–	<57 U	–
M,P-XYLENE	1330-20-7	NA	NA	NA	NA	NA	NA	NA	–	–	<150 U	–	–	–	<190 U	–	–	–	**300**	–	–	–	**2,700**	–	–	–	**2,000 J**	–	–	–	<110 U	–
METHYLENE CHLORIDE	75-09-2	30,000 (X)	100	6.60E+09	1.30E+06	100	8.30E+09	5.8E+6 (C)	–	–	<370 U	–	–	–	<480 U	–	–	–	<320 U	–	–	–	<300 U	–	–	–	<300 UJ	–	–	–	<280 U	–
NAPHTHALENE (VOC)	91-20-3V	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	–	–	<370 U	–	–	–	<480 U	–	–	–	**590**	–	–	–	**1,300**	[2]	–	–	**2,900 J**	[2]	–	–	<280 U	–
N-BUTYLBENZENE	104-51-8	ID	1,600	2E+09	2,500,000	4,600	8.8E+08	8,000,000	–	–	<75 U	–	–	–	<95 U	–	–	–	<64 U	–	–	–	**68**	–	–	–	**140 J**	–	–	–	<57 U	–
N-PROPYLBENZENE	103-65-1	ID	1,600 (I)	1.3E+09 (I)	2,500,000 (I)	4,600 (I)	5.9E+08 (I)	8,000,000 (I)	–	–	<75 U	–	–	–	<95 U	–	–	–	<64 U	–	–	–	**160**	–	–	–	**270 J**	–	–	–	<57 U	–
O-XYLENE	95-47-6	NA	NA	NA	NA	NA	NA	NA	–	–	<75 U	–	–	–	<95 U	–	–	–	**310**	–	–	–	**1,300**	–	–	–	**1,600 J**	–	–	–	<57 U	–
P-ISOPROPYL TOLUENE (p-CYMENE)	99-87-6	NA	NA	NA	NA	NA	NA	NA	–	–	<75 U	–	–	–	<95 U	–	–	–	<64 U	–	–	–	<59 U	–	–	–	**83 J**	–	–	–	<57 U	–
SEC-BUTYLBENZENE	135-98-8	ID	1,600	4.00E+08	2.50E+06	1,600	1.80E+08	8.00E+06	–	–	<75 U	–	–	–	<95 U	–	–	–	<64 U	–	–	–	<59 U	–	–	–	**90 J**	–	–	–	<57 U	–
TOLUENE	108-88-3	5,400 (I)	16,000 (I)	2.7E+10 (I)	5E+07 (C,I)	16,000 (I)	1.2E+10 (I)	1.6E+08 (C,I)	–	–	<75 U	–	–	–	<95 U	–	–	–	**170**	–	–	–	**4,600**	–	–	–	**1,700 J**	–	–	–	<57 U	–
XYLENE - TOTAL	1330-20-7	820 (I)	5,600 (I)	2.9E+11 (I)	4.1E+08 (C,I)	5600 (I)	1.3E+11 (I)	1E+09 (I)	–	–	ND	–	–	–	ND	–	–	–	**610**	–	–	–	**4,000**	[2]	–	–	**3,600 J**	[2]	–	–	ND	–
Organics - Pesticides (ug/kg)																																
4,4'-DDD	72-54-8	NLL	NLL	4.40E+07	95,000	NLL	5.60E+07	4.00E+05	<3.5 U	–	–	–	<4.7 U	–	–	–	<4.1 U	–	–	–	**14 J**	–	–	–	**46 J**	–	–	–	<3.7 U	–	–	–
4,4'-DDE	72-55-9	NLL	NLL	3.20E+07	45,000	NLL	4.00E+07	1.90E+05	<3.5 U	–	–	–	<4.7 U	–	–	–	<4.1 U	–	–	–	<3.6 U	–	–	–	<3.8 U	–	–	–	<3.7 U	–	–	–
4,4'-DDT	50-29-3	NLL	NLL	3.20E+07	57,000	NLL	4.00E+07	2.80E+05	<3.5 U	–	–	–	<4.7 U	–	–	–	<4.1 U	–	–	–	**5.6 J**	–	–	–	**14 J**	–	–	–	<3.7 U	–	–	–
ALDRIN	309-00-2	NLL	NLL	6.40E+05	1,000	NLL	8.00E+05	4,300	<1.8 U	–	–	–	<2.4 U	–	–	–	<2.1 U	–	–	–	<1.8 U	–	–	–	**6.9 J**	–	–	–	<1.9 U	–	–	–
ALPHA-BHC	319-84-6	ID	18	1.70E+06	2,600	71	2.10E+06	12,000	<1.8 U	–	–	–	<2.4 U	–	–	–	<2.1 U	–	–	–	<1.8 U	–	–	–	<2 U	–	–	–	<1.9 U	–	–	–
ALPHA-CHLORODANE	5103-71-9	NA	NA	NA	NA	NA	NA	NA	<1.8 U	–	–	–	<2.4 U	–	–	–	<2.1 U	–	–	–	<1.8 U	–	–	–	<2 U	–	–	–	<1.9 U	–	–	–
BETA-BHC	319-85-7	ID	37	5.90E+06	5,400	150	7.40E+06	25,000	<1.8 U	–	–	–	<2.4 U	–	–	–	<2.1 U	–	–	–	<1.8 U	–	–	–	<2 U	–	–	–	<1.9 U	–	–	–
DIELDRIN	60-57-1	NLL	NLL	6.80E+05	1,100	NLL	8.50E+05	4,700	<3.5 U	–	–	–	<4.7 U	–	–	–	<4.1 U	–	–	–	<3.6 U	–	–	–	<3.8 U	–	–	–	<3.7 U	–	–	–
ENDOSULFAN I	959-98-8	NA	NA	NA	NA	NA	NA	NA	<1.8 U	–	–	–	<2.4 U	–	–	–	<2.1 U	–	–	–	<1.8 U	–	–	–	<2 U	–	–	–	**1.9 J**	–	–	–
ENDOSULFAN II	33213-65-9	NA	NA	NA	NA	NA	NA	NA	<3.5 U	–	–	–	<4.7 U	–	–	–	<4.1 U	–	–	–	<3.6 U	–	–	–	**5.3 J**	–	–	–	<3.7 U	–	–	–
ENDOSULFAN SULFATE	1031-07-8	NA	NA	NA	NA	NA	NA	NA	<3.5 U	–	–	–	<4.7 U	–	–	–	<4.1 U	–	–	–	<3.6 U	–	–	–	**5.9 J**	–	–	–	<3.7 U	–	–	–
ENDRIN	72-20-8	NLL	NLL	ID	65,000	NLL	ID	1.90E+05	<3.5 U	–	–	–	<4.7 U	–	–	–	<4.1 U	–	–	–	**5 J**	–	–	–	**20 J**	–	–	–	<3.7 U	–	–	–
ENDRIN ALDEHYDE	7421-93-4	NA	NA	NA	NA	NA	NA	NA	<3.5 U	–	–	–	<4.7 U	–	–	–	<4.1 U	–	–	–	<3.6 U	–	–	–	**6.1 J**	–	–	–	<3.7 U	–	–	–
ENDRIN KETONE	53494-70-5	NA	NA	NA	NA	NA	NA	NA	<3.5 U	–	–	–	<4.7 U	–	–	–	<4.1 U	–	–	–	**10**	–	–	–	**28 J**	–	–	–	**9.6 J**	–	–	–
GAMMA-CHLORDANE	5103-74-2	NA	NA	NA	NA	NA	NA	NA	<1.8 U	–	–	–	<2.4 U	–	–	–	<2.1 U	–	–	–	<1.8 U	–	–	–	**3.6 J**	–	–	–	<1.9 U	–	–	–
HEPTACHLOR EPOXIDE	102-457-3	NLL	NLL	1.20E+06	3,100	NLL	1.50E+06	9,500	<1.8 U	–	–	–	<2.4 U	–	–	–	<2.1 U	–	–	–	<1.8 U	–	–	–	**8.4**	–	–	–	<1.9 U	–	–	–
METHOXYCHLOR	72-43-5	NA	16,000	ID	1.90E+06	16,000	ID	5.60E+06	<18 U	–	–	–	<24 U	–	–	–	<21 U	–	–	–	<18 U	–	–	–	<20 U	–	–	–	**19 J**	–	–	–
Asbestos (%)																																
ASBESTOS	ASB	NLL	NLL	1% (1.0E+7 (M); 68,000 ppb)	ID	NLL	1% (1.0E+7 (M); 85,000 ppb)	ID	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

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

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY STAMP MILLS AREA																							
Station Name	CAS Number								SS-10 (MDEQ 2013)				SS-11 (MDEQ 2013)				SS-12 (MDEQ 2013)						SS-13 (MDEQ 2013)						SS-14 (MDEQ 2013)			
Field Sample ID		[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	E3PS1 & ME3PS1		SS-10		E3PS2 & ME3PS2		SS-11		E3PS3 & ME3PS3		E3PS3DL		SS-12		E3PS4 & ME3PS4		E3PS4DL		SS-13		E3PS5 & ME3PS5		SS-14	
Sample Date									09/12/13		09/12/13		09/11/13		09/11/13		09/12/13		09/12/13		09/12/13		09/12/13		09/12/13		09/12/13		09/12/13		09/12/13	
Sample Interval (bgs)									0 - 4 in		2 - 2 in		0 - 8 in		4 - 4 in		0 - 3 in		0 - 3 in		2 - 2 in		0 - 6 in		0 - 6 in		4 - 4 in		0 - 6 in		4 - 4 in	
Sample Description									Moist, brown, silty, fine to coarse sand and gravel with some debris (wood, metal)		Moist, brown, silty, fine to coarse sand and gravel with some debris (wood, metal)		Moist, dark brown, silty sand and gravel.		Moist, dark brown, silty sand and gravel.		Moist, dark brown, silty, fine to medium sand with some debris (slag, glass, concrete, metal)		Dilution Run		Moist, dark brown, silty, fine to medium sand with some debris (slag, glass, concrete, metal)		Moist, dark brown, silty, fine to coarse sand with lots of debris (concrete, slag, glass, metal)		Dilution Run		Moist, dark brown, silty, fine to coarse sand with lots of debris (concrete, slag, glass, metal)		Moist, dark brown, fine to medium sand with some organic matter (roots)		Moist, dark brown, fine to medium sand with some organic matter (roots)	
									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	6,900 (B)	ID	50,000 (DD)	6,900 (B)	ID	370,000 (DD)	15,800	[4,11]	–	–	5790	–	–	–	20,100	[4,11]	–	–	–	–	17,000	[4,11]	–	–	–	–	13,200	[4,11]	–	–
ANTIMONY	7440-36-0	1.2 (X)	4.3	13,000	180	4.3	5,900	670	14 J	[2,4,11]	–	–	0.78 J	–	–	–	1.2 J	–	–	–	–	–	0.92 J	–	–	–	–	–	0.8 J	–	–	–
ARSENIC	7440-38-2	4.6	4.6	720	7.6	4.6	910	37	5.6	[2,4,11]	–	–	7.2	[2,4,11]	–	–	4.5	–	–	–	–	–	4.7	[2,4,11]	–	–	–	–	2.4	–	–	–
BARIUM	7440-39-3	130	1,300 (G)	330,000	37,000	1,300	150,000	130,000	21.5 J-	–	–	–	56.4 J-	–	–	–	194 J-	[2]	–	–	–	–	65 J-	–	–	–	–	–	19.7 J-	–	–	–
BERYLLIUM	7440-41-7	4.6 (G)	51	1,300	410	51	590	1,600	0.38	–	–	–	0.35 J-	–	–	–	0.47	–	–	–	–	–	0.45	–	–	–	–	–	0.4	–	–	–
CADMIUM	7440-43-9	1.6 (G,X)	6.0	1,700	550	6.0	2,200	2,100	1 J	–	–	–	0.34 J	–	–	–	1.4 J	–	–	–	–	–	1.1 J	–	–	–	–	–	0.48 J	–	–	–
CALCIUM	7440-70-2	NA	NA	NA	NA	NA	NA	NA	19,100	–	–	–	6,600	–	–	–	33,600	–	–	–	–	–	33,700	–	–	–	–	–	12,600	–	–	–
CHROMIUM	7440-47-3	1,200,000 (G,H,X)	1,000,000 (D,H)	330,000 (H)	790,000 (H)	1,000,000 (D,H)	150,000 (H)	1,000,000 (D,H)	23 J	–	–	–	10.2 J	–	–	–	25.4 J	–	–	–	–	–	24.8 J	–	–	–	–	–	19.4 J	–	–	–
COBALT	7440-48-4	2.0	0.8	13,000	2,600	2.0	5,900	9,000	19.6 J	[2,4,11]	–	–	5.9 J	[2,4,11]	–	–	20.9 J	[2,4,11]	–	–	–	–	17.8 J	[2,4,11]	–	–	–	–	16.5 J	[2,4,11]	–	–
COPPER	7440-50-8	32 (G)	5,800	130,000	20,000	5,800	59,000	73,000	19,400	[2,4,11]	–	–	333	[2]	–	–	4,390	[2]	–	–	–	–	2,010	[2]	–	–	–	–	974	[2]	–	–
IRON	7439-89-6	NA	12,000 (B)	ID	160,000	12,000 (B)	ID	580,000	40,700	[4,11]	–	–	16,400	[4,11]	–	–	34,300	[4,11]	–	–	–	–	30,400	[4,11]	–	–	–	–	25,900	[4,11]	–	–
LEAD	7439-92-1	1,900 (G,X)	700	100,000	400	700	44,000	900 (DD)	501	[10]	–	–	124	–	–	–	417	[10]	–	–	–	–	164	–	–	–	–	–	12.4	–	–	–
LITHIUM	7439-93-2	9.8 (B)	9.8 (B)	2,300,000	4,200 (DD)	9.8 (B)	1,000,000	31,000 (DD)	–	–	–	–	–	–	–	–	–	–	–	–	–	–			–	–	–	–			–	–
MAGNESIUM	7439-95-4	NA	8,000	6,700,000	1,000,000 (D)	22,000	2,900,000	1,000,000 (D)	10,600	[4]	–	–	3,050	–	–	–	12,600	[4]	–	–	–	–	10,100	[4]	–	–	–	–	10,100	[4]	–	–
MANGANESE	7439-96-5	440 (B,G,X)	440 (B)	3,300	25,000	440 (B)	1,500	90,000	850	[2,4,11]	–	–	237	–	–	–	742	[2,4,11]	–	–	–	–	595	[2,4,11]	–	–	–	–	469	[2,4,11]	–	–
MERCURY	7439-97-6	0.13 (B, Z)	1.7 (Z)	20000 (Z)	160 (Z)	1.7 (Z)	8800 (Z)	580 (Z)	0.41	[2]	–	–	0.15	[2]	–	–	0.15	[2]	–	–	–	–	0.37	[2]	–	–	–	–	0.048 J	–	–	–
NICKEL	7440-02-0	29 (G)	100	13,000	40,000	100	16,000	150,000	30.8 J	[2]	–	–	11.6 J	–	–	–	35.9 J	[2]	–	–	–	–	30.9 J	[2]	–	–	–	–	24.3 J	–	–	–
POTASSIUM	7440-09-7	NA	NA	NA	NA	NA	NA	NA	<376 U	–	–	–	277 J	–	–	–	178 J	–	–	–	–	–	141 J-	–	–	–	–	–	<386 U	–	–	–
SELENIUM	7782-49-2	0.41 (B)	4.0	130,000	2,600	4.0	59,000	9,600	<2.6 UJ	–	–	–	<3.1 UJ	–	–	–	<2.9 UJ	–	–	–	–	–	<2.9 UJ	–	–	–	–	–	<2.7 UJ	–	–	–
SILVER	7440-22-4	1.0 (M); 0.027	4.5	6,700	2,500	13	2,900	9,000	13.5 J+	[2,4,11]	–	–	1.9 J+	[2]	–	–	5.4 J+	[2,4]	–	–	–	–	4.1 J+	[2]	–	–	–	–	4.5 J+	[2]	–	–
SODIUM	7440-23-5	NA	NA	NA	NA	NA	NA	NA	175 J	–	–	–	108 J	–	–	–	208 J	–	–	–	–	–	182 J	–	–	–	–	–	115 J	–	–	–
THALLIUM	7440-28-0	1.4	2.3	13,000	35	2.3	5,900	130	2.1 J	–	–	–	<2.2 UJ	–	–	–	<20.7 UJ	–	–	–	–	–	R	–	–	–	–	–	R	–	–	–
VANADIUM	7440-62-2	430	72	ID	750 (DD)	990	ID	5,500 (DD)	72.4	[4]	–	–	28	–	–	–	66.5	–	–	–	–	–	57.3	–	–	–	–	–	57.9	–	–	–
ZINC	7440-66-6	62 (G)	2,400	ID	170,000	5,000	ID	630,000	333	[2]	–	–	67	[2]	–	–	368	[2]	–	–	–	–	220	[2]	–	–	–	–	52	–	–	–
Inorganics - Cyanide (mg/kg)																																
CYANIDE	57-12-5	0.1 (P,R)	4.0 (P,R)	250 (P,R)	12 (P,R)	4.0 (P,R)	250 (P,R)	250 (P,R)	<0.54 U	–	–	–	0.1 J	–	–	–	0.19 J	[2]	–	–	–	–	0.13 J	[2]	–	–	–	–	<0.54 U	–	–	–
Organics - PCBs (ug/kg)																																
AROCLOR-1260	11096-82-5	NA	NA	NA	NA	NA	NA	NA	<35 U	–	–	–	<39 U	–	–	–	<39 U	–	–	–	–	–	<38 U	–	–	–	–	–	<35 U	–	–	–
AROCLOR-1262	37324-23-5	NA	NA	NA	NA	NA	NA	NA	<35 U	–	–	–	<39 U	–	–	–	<39 U	–	–	–	–	–	<38 U	–	–	–	–	–	<35 U	–	–	–
TOTAL PCBS	TPCB	NLL	NLL	5,200,000 (J)	1,000 (J,T)	NLL	6,500,000 (J)	1,000 (J,T)	ND	–	–	–	ND	–	–	–	ND	–	–	–	–	–	ND	–	–	–	–	–	ND	–	–	–

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location		[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	QUINCY STAMP MILLS AREA																							
Station Name	CAS Number								SS-10 (MDEQ 2013)				SS-11 (MDEQ 2013)				SS-12 (MDEQ 2013)						SS-13 (MDEQ 2013)						SS-14 (MDEQ 2013)			
Field Sample ID									E3PS1 & ME3PS1		SS-10		E3PS2 & ME3PS2		SS-11		E3PS3 & ME3PS3		E3PS3DL		SS-12		E3PS4 & ME3PS4		E3PS4DL		SS-13		E3PS5 & ME3PS5		SS-14	
Sample Date									09/12/13		09/12/13		09/11/13		09/11/13		09/12/13		09/12/13		09/12/13		09/12/13		09/12/13		09/12/13		09/12/13		09/12/13	
Sample Interval (bgs)									0 - 4 in		2 - 2 in		0 - 8 in		4 - 4 in		0 - 3 in		0 - 3 in		2 - 2 in		0 - 6 in		0 - 6 in		4 - 4 in		0 - 6 in		4 - 4 in	
Sample Description									Moist, brown, silty, fine to coarse sand and gravel with some debris (wood, metal)		Moist, brown, silty, fine to coarse sand and gravel with some debris (wood, metal)		Moist, dark brown, silty sand and gravel.		Moist, dark brown, silty sand and gravel.		Moist, dark brown, silty, fine to medium sand with some debris (slag, glass, concrete, metal)		Dilution Run		Moist, dark brown, silty, fine to medium sand with some debris (slag, glass, concrete, metal)		Moist, dark brown, silty, fine to coarse sand with lots of debris (concrete, slag, glass, metal)		Dilution Run		Moist, dark brown, silty, fine to coarse sand with lots of debris (concrete, slag, glass, metal)		Moist, dark brown, fine to medium sand with some organic matter (roots)		Moist, dark brown, fine to medium sand with some organic matter (roots)	
									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)																																
1,1'-BIPHENYL	92-52-4	NA	NA	NA	NA	NA	NA	NA	<180 U	--	--	--	<200 U	--	--	--	590 J	--	<20000 U	--	--	--	1200 J	--	<39000 U	--	--	--	<180 U	--	--	--
2-METHYLNAPHTHALENE (SVOC)	91-57-6S	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07	<180 U	--	--	--	100 J	--	--	--	2,000	--	<20000 U	--	--	--	4,400	[2]	<39000 U	--	--	--	<180 U	--	--	--
ACENAPHTHENE	83-32-9	8,700	300,000	1.4E+10	4.1E+07	880,000	6.2E+09	1.3E+08	<180 U	--	--	--	<200 U	--	--	--	3,000	--	<20000 U	--	--	--	8300	--	7,700 J	--	--	--	<180 U	--	--	--
ACENAPHTHYLENE	208-96-8	ID	5,900	2.3E+09	1,600,000	17,000	1E+09	5,200,000	<180 U	--	--	--	66 J	--	--	--	7,400	[4]	7,900 J	[4]	--	--	20,000	[4,11]	15,000 J	[4]	--	--	<180 U	--	--	--
ACETOPHENONE	98-86-2	ID	30,000	3.3E+10	4.7E+07 (C)	88,000	1.4E+10	1.5E+08 (C)	<180 U	--	--	--	100 J	--	--	--	470 J	--	<20000 U	--	--	--	1,700 J	--	<39000 U	--	--	--	69 J	--	--	--
ANTHRACENE	120-12-7	ID	41,000	6.7E+10	2.3E+08	41,000	2.9E+10	7.3E+08	<180 U	--	--	--	140 J	--	--	--	14,000	--	16,000 J	--	--	--	36,000 J	--	35,000 J	--	--	--	<180 U	--	--	--
BENZO(A)ANTHRACENE	56-55-3	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)	<180 U	--	--	--	610	--	--	--	46,000 J	[10]	53,000	[10]	--	--	130,000 J	[10,17]	120,000	[10,17]	--	--	55 J	--	--	--
BENZO(A)PYRENE	50-32-8	NLL	NLL	1,500,000 (Q)	2,000 (Q)	NLL	1,900,000 (Q)	8,000 (Q)	<180 U	--	--	--	400	--	--	--	39,000 J	[10,17]	41,000	[10,17]	--	--	120,000 J	[10,17]	110,000	[10,17]	--	--	85 J	--	--	--
BENZO(B)FLUORANTHENE	205-99-2	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)	42 J	--	--	--	660	--	--	--	51,000 J	[10]	61,000	[10]	--	--	170,000 J	[10,17]	150,000	[10,17]	--	--	97 J	--	--	--
BENZO(G,H,I)PERYLENE	191-24-2	NLL	NLL	8E+08 (Q)	2,500,000 (Q)	NLL	3.5E+08 (Q)	7,000,000 (Q)	<180 U	--	--	--	280	--	--	--	27,000	--	23,000	--	--	--	68,000 J	--	65,000	--	--	--	150 J	--	--	--
BENZO(K)FLUORANTHENE	207-08-9	NLL	NLL	ID	200,000 (Q)	NLL	ID	800,000 (Q)	<180 U	--	--	--	300	--	--	--	29,000	--	25,000	--	--	--	79,000 J	--	89,000	--	--	--	72 J	--	--	--
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	NLL	NLL	7E+08	2,800,000	NLL	8.9E+08	1.2E+07 (C)	56 J	--	--	--	<200 U	--	--	--	<2000 U	--	<20000 U	--	--	--	<2000 U	--	<39000 U	--	--	--	<180 U	--	--	--
CARBAZOLE	86-74-8	1,100	9,400	6.2E+07	530,000	39,000	7.8E+07	2,400,000	<180 U	--	--	--	<200 U	--	--	--	6,100	[2]	6,400 J	[2]	--	--	18,000	[2,4]	16,000 J	[2,4]	--	--	<180 U	--	--	--
CHRYSENE	218-01-9	NLL	NLL	ID	2,000,000 (Q)	NLL	ID	8,000,000 (Q)	<180 U	--	--	--	710	--	--	--	47,000 J	--	50,000	--	--	--	150,000 J	--	150,000	--	--	--	75 J	--	--	--
DIBENZO(A,H)ANTHRACENE	53-70-3	NLL	NLL	ID	2,000 (Q)	NLL	ID	8,000 (Q)	<180 U	--	--	--	100 J	--	--	--	8,500	[10,17]	7,300 J	[10]	--	--	23,000	[10,17]	20,000 J	[10,17]	--	--	<180 U	--	--	--
DIBENZOFURAN	132-64-9	1,700	ID	6,700,000	ID	ID	2,900,000	ID	<180 U	--	--	--	<200 U	--	--	--	3,700	[2]	4,000 J	[2]	--	--	8,300	[2]	<39000 U	--	--	--	<180 U	--	--	--
DI-N-BUTYLPHTHALATE	84-74-2	11000	960,000	3.30E+09	2.70E+07	2.7E+6 (C)	1.50E+09	8.7E+7 (C)	100 J	--	--	--	100 J	--	--	--	<2000 U	--	<20000 U	--	--	--	<2000 U	--	<39000 U	--	--	--	86 J	--	--	--
FLUORANTHENE	206-44-0	5,500	730,000	9.3E+09	4.6E+07	730,000	4.1E+09	1.3E+08	42 J	--	--	--	880	--	--	--	110,000 J	[2]	130,000	[2]	--	--	320,000 J	[2]	290,000	[2]	--	--	110 J	--	--	--
FLUORENE	86-73-7	5,300	390,000	9.3E+09	2.7E+07	890,000	4.1E+09	8.7E+07	<180 U	--	--	--	<200 U	--	--	--	6,400	[2]	7,000 J	[2]	--	--	12,000	[2]	11,000 J	[2]	--	--	<180 U	--	--	--
INDENO(1,2,3-CD)PYRENE	193-39-5	NLL	NLL	ID	20,000	NLL	ID	80,000	<180 U	--	--	--	270	--	--	--	27,000	[10]	23,000	[10]	--	--	72,000 J	[10]	64,000	[10]	--	--	67 J	--	--	--
NAPHTHALENE (SVOC)	91-20-3S	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	<180 U	--	--	--	74 J	--	--	--	4,000	[2]	4,500 J	[2]	--	--	8,600	[2]	8,300 J	[2]	--	--	<180 U	--	--	--
PHENANTHRENE	85-01-8	2,100	56,000	6,700,000	1,600,000	160,000	2,900,000	5,200,000	<180 U	--	--	--	570	--	--	--	70,000 J	[2,4]	70,000	[2,4]	--	--	180,000 J	[2,4,6,7,8,11]	170,000	[2,4,6,7,8,11]	--	--	64 J	--	--	--
PYRENE	129-00-0	ID	480,000	6.7E+09	2.9E+07	480,000	2.9E+09	8.4E+07	42 J	--	--	--	1,300	--	--	--	88,000 J	--	86,000	--	--	--	250,000 J	--	240,000	--	--	--	140 J	--	--	--
Organics - VOCs (ug/kg)																																
1,2,3-TRIMETHYLBENZENE	526-73-8	NA	NA	NA	NA	NA	NA	NA	--	--	<60 U	--	--	--	<69 U	--	--	--	--	--	<67 U	--	--	--	--	--	<69 U	--	--	--	<60 U	--
1,2,4-TRIMETHYLBENZENE	95-63-6	570 (I)	2,100 (I)	8.2E+10 (I)	3.2E+07 (C,I)	2,100 (I)	3.6E+10 (I)	1E+08 (C,I)	--	--	<60 U	--	--	--	83	--	--	--	--	--	<67 U	--	--	--	--	--	<69 U	--	--	--	<60 U	--
1,3,5-TRIMETHYLBENZENE	108-67-8	1,100 (I)	1,800 (I)	8.2E+10 (I)	3.2E+07 (C,I)	1,800 (I)	3.6E+10 (I)	1E+08 (C,I)	--	--	<60 U	--	--	--	<69 U	--	--	--	--	--	<67 U	--	--	--	--	--	<69 U	--	--	--	<60 U	--
2-METHYLNAPHTHALENE (VOC)	91-57-6V	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07	--	--	<300 U	--	--	--	<350 U	--	--	--	--	--	640	--	--	--	--	--	420	--	--	--	<300 U	--
BENZENE	71-43-2	240 (I,X)	100 (I)	3.8E+08 (I)	180,000 (I)	100 (I)	4.7E+08 (I)	840,000 (C,I)	--	--	<60 U	--	--	--	<69 U	--	--	--	--	--	<67 U	--	--	--	--	--	<69 U	--	--	--	<60 U	--
CYCLOHEXANE	110-82-7	NA	NA	NA	NA	NA	NA	NA	--	--	<300 U	--	--	--	<350 U	--	--	--	--	--	<330 U	--	--	--	--	--	<340 U	--	--	--	<300 U	--
ETHYLBENZENE	100-41-4	360 (I)	1,500 (I)	1E+10 (I)	2.2E+07 (C,I)	1,500 (I)	1.3E+10 (I)	7.1E+07 (C, I)	--	--	<60 U	--	--	--	<69 U	--	--	--	--	--	<67 U	--	--	--	--	--	<69 U	--	--	--	<60 U	--
HEXANE	110-54-3	NA	1.8E+05 (C)	1.30E+10	9.2E+07 (C)	5.1E+5 (C)	5.90E+09	3.0E+8 (C)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria
Organics - VOCs (ug/kg) (continued)								
ISOPROPYLBENZENE	98-82-8	3,200	91,000	5.8E+09	2.5E+07 (C)	260,000	2.6E+09	8E+07 (C)
M,P-XYLENE	1330-20-7	NA	NA	NA	NA	NA	NA	NA
METHYLENE CHLORIDE	75-09-2	30,000 (X)	100	6.60E+09	1.30E+06	100	8.30E+09	5.8E+6 (C)
NAPHTHALENE (VOC)	91-20-3V	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07
N-BUTYLBENZENE	104-51-8	ID	1,600	2E+09	2,500,000	4,600	8.8E+08	8,000,000
N-PROPYLBENZENE	103-65-1	ID	1,600 (I)	1.3E+09 (I)	2,500,000 (I)	4,600 (I)	5.9E+08 (I)	8,000,000 (I)
O-XYLENE	95-47-6	NA	NA	NA	NA	NA	NA	NA
P-ISOPROPYL TOLUENE (p-CYMENE)	99-87-6	NA	NA	NA	NA	NA	NA	NA
SEC-BUTYLBENZENE	135-98-8	ID	1,600	4.00E+08	2.50E+06	1,600	1.80E+08	8.00E+06
TOLUENE	108-88-3	5,400 (I)	16,000 (I)	2.7E+10 (I)	5E+07 (C,I)	16,000 (I)	1.2E+10 (I)	1.6E+08 (C,I)
XYLENE - TOTAL	1330-20-7	820 (I)	5,600 (I)	2.9E+11 (I)	4.1E+08 (C,I)	5600 (I)	1.3E+11 (I)	1E+09 (I)
Organics - Pesticides (ug/kg)								
4,4'-DDD	72-54-8	NLL	NLL	4.40E+07	95,000	NLL	5.60E+07	4.00E+05
4,4'-DDE	72-55-9	NLL	NLL	3.20E+07	45,000	NLL	4.00E+07	1.90E+05
4,4'-DDT	50-29-3	NLL	NLL	3.20E+07	57,000	NLL	4.00E+07	2.80E+05
ALDRIN	309-00-2	NLL	NLL	6.40E+05	1,000	NLL	8.00E+05	4,300
ALPHA-BHC	319-84-6	ID	18	1.70E+06	2,600	71	2.10E+06	12,000
ALPHA-CHLORODANE	5103-71-9	NA	NA	NA	NA	NA	NA	NA
BETA-BHC	319-85-7	ID	37	5.90E+06	5,400	150	7.40E+06	25,000
DIELDRIN	60-57-1	NLL	NLL	6.80E+05	1,100	NLL	8.50E+05	4,700
ENDOSULFAN I	959-98-8	NA	NA	NA	NA	NA	NA	NA
ENDOSULFAN II	33213-65-9	NA	NA	NA	NA	NA	NA	NA
ENDOSULFAN SULFATE	1031-07-8	NA	NA	NA	NA	NA	NA	NA
ENDRIN	72-20-8	NLL	NLL	ID	65,000	NLL	ID	1.90E+05
ENDRIN ALDEHYDE	7421-93-4	NA	NA	NA	NA	NA	NA	NA
ENDRIN KETONE	53494-70-5	NA	NA	NA	NA	NA	NA	NA
GAMMA-CHLORDANE	5103-74-2	NA	NA	NA	NA	NA	NA	NA
HEPTACHLOR EPOXIDE	102-457-3	NLL	NLL	1.20E+06	3,100	NLL	1.50E+06	9,500
METHOXYCHLOR	72-43-5	NA	16,000	ID	1.90E+06	16,000	ID	5.60E+06
Asbestos (%)								
ASBESTOS	ASB	NLL	NLL	1% (1.0E+7 (M); 68,000 ppb)	ID	NLL	1% (1.0E+7 (M); 85,000 ppb)	ID

Geographic Location	QUINCY STAMP MILLS AREA																							
Station Name	SS-10 (MDEQ 2013)				SS-11 (MDEQ 2013)				SS-12 (MDEQ 2013)						SS-13 (MDEQ 2013)						SS-14 (MDEQ 2013)			
Field Sample ID	E3PS1 & ME3PS1		SS-10		E3PS2 & ME3PS2		SS-11		E3PS3 & ME3PS3		E3PS3DL		SS-12		E3PS4 & ME3PS4		E3PS4DL		SS-13		E3PS5 & ME3PS5		SS-14	
Sample Date	09/12/13		09/12/13		09/11/13		09/11/13		09/12/13		09/12/13		09/12/13		09/12/13		09/12/13		09/12/13		09/12/13		09/12/13	
Sample Interval (bgs)	0 - 4 in		2 - 2 in		0 - 8 in		4 - 4 in		0 - 3 in		0 - 3 in		2 - 2 in		0 - 6 in		0 - 6 in		4 - 4 in		0 - 6 in		4 - 4 in	
Sample Description	Moist, brown, silty, fine to coarse sand and gravel with some debris (wood, metal)		Moist, brown, silty, fine to coarse sand and gravel with some debris (wood, metal)		Moist, dark brown, silty sand and gravel.		Moist, dark brown, silty sand and gravel.		Moist, dark brown, silty, fine to medium sand with some debris (slag, glass, concrete, metal)		Dilution Run		Moist, dark brown, silty, fine to medium sand with some debris (slag, glass, concrete, metal)		Moist, dark brown, silty, fine to coarse sand with lots of debris (concrete, slag, glass, metal)		Dilution Run		Moist, dark brown, silty, fine to coarse sand with lots of debris (concrete, slag, glass, metal)		Moist, dark brown, fine to medium sand with some organic matter (roots)		Moist, dark brown, fine to medium sand with some organic matter (roots)	
	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 - VOCs (ug/kg) (continued)																								
ISOPROPYLBENZENE	–	–	<60 U	–	–	–	<69 U	–	–	–	–	–	<67 U	–	–	–	–	–	<69 U	–	–	–	<60 U	–
M,P-XYLENE	–	–	<120 U	–	–	–	**140**	–	–	–	–	–	<130 U	–	–	–	–	–	<140 U	–	–	–	<120 U	–
METHYLENE CHLORIDE	–	–	<300 U	–	–	–	<350 U	–	–	–	–	–	<330 U	–	–	–	–	–	<340 U	–	–	–	<300 U	–
NAPHTHALENE (VOC)	–	–	<300 U	–	–	–	<350 U	–	–	–	–	–	**1,800**	[2]	–	–	–	–	**1,100**	[2]	–	–	<300 U	–
N-BUTYLBENZENE	–	–	<60 U	–	–	–	<69 U	–	–	–	–	–	<67 U	–	–	–	–	–	<69 U	–	–	–	<60 U	–
N-PROPYLBENZENE	–	–	<60 U	–	–	–	<69 U	–	–	–	–	–	<67 U	–	–	–	–	–	<69 U	–	–	–	<60 U	–
O-XYLENE	–	–	**66**	–	–	–	**100**	–	–	–	–	–	<67 U	–	–	–	–	–	<69 U	–	–	–	<60 U	–
P-ISOPROPYL TOLUENE (p-CYMENE)	–	–	<60 U	–	–	–	<69 U	–	–	–	–	–	<67 U	–	–	–	–	–	<69 U	–	–	–	<60 U	–
SEC-BUTYLBENZENE	–	–	<60 U	–	–	–	<69 U	–	–	–	–	–	<67 U	–	–	–	–	–	<69 U	–	–	–	<60 U	–
TOLUENE	–	–	<60 U	–	–	–	**120**	–	–	–	–	–	<67 U	–	–	–	–	–	<69 U	–	–	–	<60 U	–
XYLENE - TOTAL	–	–	**66**	–	–	–	**240**	–	–	–	–	–	ND	–	–	–	–	–	ND	–	–	–	ND	–
Organics - Pesticides (ug/kg)																								
4,4'-DDD	<3.5 U	–	–	–	<3.9 U	–	–	–	**22 J**	–	<76 U	–	–	–	<3.8 UJ	–	<190 U	–	–	–	<3.6 U	–	–	–
4,4'-DDE	<3.5 U	–	–	–	<3.9 U	–	–	–	**8 J**	–	<76 U	–	–	–	**14 J**	–	<190 U	–	–	–	<3.6 U	–	–	–
4,4'-DDT	<3.5 U	–	–	–	<3.9 U	–	–	–	**7.9 J**	–	<76 U	–	–	–	**16 J**	–	<190 U	–	–	–	<3.6 U	–	–	–
ALDRIN	<1.8 U	–	–	–	<2 U	–	–	–	**7.5 J**	–	<39 U	–	–	–	**20 J**	–	<98 U	–	–	–	<1.8 U	–	–	–
ALPHA-BHC	<1.8 U	–	–	–	<2 U	–	–	–	<2 U	–	<39 U	–	–	–	**2.3 J**	–	<98 U	–	–	–	<1.8 U	–	–	–
ALPHA-CHLORODANE	<1.8 U	–	–	–	<2 U	–	–	–	**26 J**	–	<39 U	–	–	–	<2 UJ	–	<98 U	–	–	–	<1.8 U	–	–	–
BETA-BHC	<1.8 U	–	–	–	<2 U	–	–	–	**5.5 J**	–	<39 U	–	–	–	**8.4 J**	–	<98 U	–	–	–	<1.8 U	–	–	–
DIELDRIN	<3.5 U	–	–	–	<3.9 U	–	–	–	<3.8 U	–	<76 U	–	–	–	<3.8 UJ	–	<190 U	–	–	–	<3.6 U	–	–	–
ENDOSULFAN I	<1.8 U	–	–	–	<2 U	–	–	–	<2 U	–	<39 U	–	–	–	**5 J**	–	<98 U	–	–	–	<1.8 U	–	–	–
ENDOSULFAN II	<3.5 U	–	–	–	<3.9 U	–	–	–	<3.8 U	–	<76 U	–	–	–	<3.8 UJ	–	<190 U	–	–	–	<3.6 U	–	–	–
ENDOSULFAN SULFATE	<3.5 U	–	–	–	<3.9 U	–	–	–	<3.8 U	–	<76 U	–	–	–	**140 J**	–	**260 J**	–	–	–	<3.6 U	–	–	–
ENDRIN	<3.5 U	–	–	–	<3.9 U	–	–	–	**8.8 J**	–	<76 U	–	–	–	**20 J**	–	<190 U	–	–	–	<3.6 U	–	–	–
ENDRIN ALDEHYDE	<3.5 U	–	–	–	<3.9 U	–	–	–	**24 J**	–	<76 U	–	–	–	**4.1 J**	–	<190 U	–	–	–	<3.6 U	–	–	–
ENDRIN KETONE	<3.5 U	–	–	–	<3.9 U	–	–	–	**82 J**	–	**82 J**	–	–	–	**150 J**	–	<190 U	–	–	–	<3.6 U	–	–	–
GAMMA-CHLORDANE	<1.8 U	–	–	–	<2 U	–	–	–	<2 U	–	<39 U	–	–	–	<2 UJ	–	<98 U	–	–	–	<1.8 U	–	–	–
HEPTACHLOR EPOXIDE	<1.8 U	–	–	–	<2 U	–	–	–	**11 J**	–	<39 U	–	–	–	**19 J**	–	<98 U	–	–	–	<1.8 U	–	–	–
METHOXYCHLOR	<18 U	–	–	–	<20 U	–	–	–	**51 J**	–	<390 U	–	–	–	<20 UJ	–	**250 J**	–	–	–	<18 U	–	–	–
Asbestos (%)																								
ASBESTOS	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

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

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY STAMP MILLS AREA														QUINCY RECLAMATION PLANT AREA									
Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	SS-15 (MDEQ 2013)				SS-16 (MDEQ 2013)				TM-S1-02		TM-S1-05		TM-S2-02		MasonB-10		MS-S1-12		MS-S1-13		QMCM-SB09			
Field Sample ID									E3PS6 & ME3PS6		SS-15		E3PS7 & ME3PS7		SS-16		TMS1-2		TMS1-5		TMS2-2		Mason XRF10		MSS1-12		MSS1-13		QMCM-SB 09-0-6"		QMCM-SB 09-6"-4'	
Sample Date									09/11/13		09/11/13		09/11/13		09/11/13		09/12/07		09/12/07		09/12/07		09/06/07		09/12/07		09/12/07		05/20/17		05/20/17	
Sample Interval (bgs)									0 - 6 in		6 - 6 in		0 - 10 in		6 - 6 in		0 - 0 ft		0 - 0 ft		0 - 0 ft		0 - 0 in		0 - 0 ft		0 - 0 ft		0 - 0.5 ft		0.5 - 4 ft	
Sample Description									Moist, brown, silty, fine sand with lots of organics, glass, plastic, metal and wood pieces		Moist, brown, silty, fine sand with lots of organics, glass, plastic, metal and wood pieces		Moist, black, fine to coarse stamp sand, sand, and coal		Moist, black, fine to coarse stamp sand, sand, and coal		–		–		–		–		–		–		TOPSOIL to 6 in		SAND, Fine to medium, gray to 5 ft; saturated at 4 ft	
									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	6,900 (B)	ID	50,000 (DD)	6,900 (B)	ID	370,000 (DD)	7,120	[4,11]	–	–	15,700	[4,11]	–	–	19,000 J	[4,11]	20,000	[4,11]	27,000	[4,11]	21,000 J	[4,11]	9,700	[4,11]	23,000	[4,11]	–	–	–	–
ANTIMONY	7440-36-0	1.2 (X)	4.3	13,000	180	4.3	5,900	670	2.7 J	[2]	–	–	1.1 J	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ARSENIC	7440-38-2	4.6	4.6	720	7.6	4.6	910	37	9	[2,4,10,11]	–	–	4.8	[2,4,11]	–	–	0.35 J	–	9.8	[2,4,10,11]	1.2	–	1.7	–	<0.98 U	–	8.6	[2,4,10,11]	1.4	–	1.5	–
BARIUM	7440-39-3	130	1,300 (G)	330,000	37,000	1,300	150,000	130,000	181 J-	[2]	–	–	R	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BERYLLIUM	7440-41-7	4.6 (G)	51	1,300	410	51	590	1,600	0.4 J-	–	–	–	0.36 J	–	–	–	<3.3 UJ	–	0.58 J	–	<4.3 U	–	<3.6 U	–	<4.9 U	–	<4.2 U	–	–	–	–	–
CADMIUM	7440-43-9	1.6 (G,X)	6.0	1,700	550	6.0	2,200	2,100	3.3 J	[2]	–	–	0.43 J	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CALCIUM	7440-70-2	NA	NA	NA	NA	NA	NA	NA	15,800	–	–	–	14,900	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CHROMIUM	7440-47-3	1,200,000 (G,H,X)	1,000,000 (D,H)	330,000 (H)	790,000 (H)	1,000,000 (D,H)	150,000 (H)	1,000,000 (D,H)	45.4 J	–	–	–	18.1 J	–	–	–	14 J	–	20	–	19	–	10	–	7.1 J	–	18	–	10	–	7.9	–
COBALT	7440-48-4	2.0	0.8	13,000	2,600	2.0	5,900	9,000	6.5 J	[2,4,11]	–	–	18.7 J	[2,4,11]	–	–	15 J	[2,4,11]	21	[2,4,11]	25	[2,4,11]	17	[2,4,11]	7.7	[2,4,11]	18	[2,4,11]	–	–	–	–
COPPER	7440-50-8	32 (G)	5,800	130,000	20,000	5,800	59,000	73,000	923	[2]	–	–	10,300	[2,4,11]	–	–	2,700 J	[2]	9,100	[2,4,11]	2,000	[2]	19,000	[2,4,11]	230	[2]	2,500	[2]	640	[2]	270	[2]
IRON	7439-89-6	NA	12,000 (B)	ID	160,000	12,000 (B)	ID	580,000	51,000	[4,11]	–	–	29,800	[4,11]	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
LEAD	7439-92-1	1,900 (G,X)	700	100,000	400	700	44,000	900 (DD)	310	–	–	–	9.5	–	–	–	8 J	–	530	[10]	7.3 J	–	200	–	6.7 J	–	200	–	14	–	8.3	–
LITHIUM	7439-93-2	9.8 (B)	9.8 (B)	2,300,000	4,200 (DD)	9.8 (B)	1,000,000	31,000 (DD)			–	–			–	–	7.1	–	5	–	6.3	–	3.4	–	3.1	–	7.6	–	–	–	–	–
MAGNESIUM	7439-95-4	NA	8,000	6,700,000	1,000,000 (D)	22,000	2,900,000	1,000,000 (D)	3,870	–	–	–	12,300	[4]	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MANGANESE	7439-96-5	440 (B,G,X)	440 (B)	3,300	25,000	440 (B)	1,500	90,000	406	–	–	–	551	[2,4,11]	–	–	430	–	530	[2,4,11]	670	[2,4,11]	520	[2,4,11]	240	–	550	[2,4,11]	–	–	–	–
MERCURY	7439-97-6	0.13 (B, Z)	1.7 (Z)	20000 (Z)	160 (Z)	1.7 (Z)	8800 (Z)	580 (Z)	0.075 J	–	–	–	0.16	[2]	–	–	0.038	–	0.22	[2]	0.044	–	0.12	–	0.022	–	0.28	[2]	<0.06 U	–	0.1	–
NICKEL	7440-02-0	29 (G)	100	13,000	40,000	100	16,000	150,000	28.5 J	–	–	–	29.1 J	[2]	–	–	24 J	–	30	[2]	34	[2]	32	[2]	14	–	31	[2]	–	–	–	–
POTASSIUM	7440-09-7	NA	NA	NA	NA	NA	NA	NA	431 J	–	–	–	<410 U	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SELENIUM	7782-49-2	0.41 (B)	4.0	130,000	2,600	4.0	59,000	9,600	<3.6 UJ	–	–	–	<2.9 UJ	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	<0.2 U	–	<0.2 U	–
SILVER	7440-22-4	1.0 (M); 0.027	4.5	6,700	2,500	13	2,900	9,000	6 J+	[2,4]	–	–	4.2 J+	[2]	–	–	1.2 J	[2]	2.4	[2]	1.4	[2]	5.4	[2,4]	0.37	–	3.1	[2]	0.7	–	0.3	–
SODIUM	7440-23-5	NA	NA	NA	NA	NA	NA	NA	246 J	–	–	–	122 J	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
THALLIUM	7440-28-0	1.4	2.3	13,000	35	2.3	5,900	130	<2.6 UJ	–	–	–	<20.5 UJ	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
VANADIUM	7440-62-2	430	72	ID	750 (DD)	990	ID	5,500 (DD)	30.6	–	–	–	62.9	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ZINC	7440-66-6	62 (G)	2,400	ID	170,000	5,000	ID	630,000	761	[2]	–	–	67	[2]	–	–	59	–	100	[2]	87	[2]	110 J	[2]	60	–	170	[2]	47	–	21	–
Inorganics - Cyanide (mg/kg)																																
CYANIDE	57-12-5	0.1 (P,R)	4.0 (P,R)	250 (P,R)	12 (P,R)	4.0 (P,R)	250 (P,R)	250 (P,R)	0.3 J	[2]	–	–	<0.55 U	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Organics - PCBs (ug/kg)																																
AROCLOR-1260	11096-82-5	NA	NA	NA	NA	NA	NA	NA	<47 UJ	–	–	–	<35 U	–	–	–	<35 U	–	<37 U	–	<38 U	–	<35 U	–	<42 U	–	<37 U	–	<120 U	–	<120 U	–
AROCLOR-1262	37324-23-5	NA	NA	NA	NA	NA	NA	NA	430 J	–	–	–	<35 U	–	–	–	<35 U	–	<37 U	–	<38 U	–	<35 U	–	<42 U	–	<37 U	–	<120 U	–	<120 U	–
TOTAL PCBS	TPCB	NLL	NLL	5,200,000 (J)	1,000 (J,T)	NLL	6,500,000 (J)	1,000 (J,T)	430 J	–	–	–	ND	–	–	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria
Organics - SVOCs (ug/kg)								
1,1'-BIPHENYL	92-52-4	NA	NA	NA	NA	NA	NA	NA
2-METHYLNAPHTHALENE (SVOC)	91-57-6S	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07
ACENAPHTHENE	83-32-9	8,700	300,000	1.4E+10	4.1E+07	880,000	6.2E+09	1.3E+08
ACENAPHTHYLENE	208-96-8	ID	5,900	2.3E+09	1,600,000	17,000	1E+09	5,200,000
ACETOPHENONE	98-86-2	ID	30,000	3.3E+10	4.7E+07 (C)	88,000	1.4E+10	1.5E+08 (C)
ANTHRACENE	120-12-7	ID	41,000	6.7E+10	2.3E+08	41,000	2.9E+10	7.3E+08
BENZO(A)ANTHRACENE	56-55-3	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)
BENZO(A)PYRENE	50-32-8	NLL	NLL	1,500,000 (Q)	2,000 (Q)	NLL	1,900,000 (Q)	8,000 (Q)
BENZO(B)FLUORANTHENE	205-99-2	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)
BENZO(G,H,I)PERYLENE	191-24-2	NLL	NLL	8E+08 (Q)	2,500,000 (Q)	NLL	3.5E+08 (Q)	7,000,000 (Q)
BENZO(K)FLUORANTHENE	207-08-9	NLL	NLL	ID	200,000 (Q)	NLL	ID	800,000 (Q)
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	NLL	NLL	7E+08	2,800,000	NLL	8.9E+08	1.2E+07 (C)
CARBAZOLE	86-74-8	1,100	9,400	6.2E+07	530,000	39,000	7.8E+07	2,400,000
CHRYSENE	218-01-9	NLL	NLL	ID	2,000,000 (Q)	NLL	ID	8,000,000 (Q)
DIBENZO(A,H)ANTHRACENE	53-70-3	NLL	NLL	ID	2,000 (Q)	NLL	ID	8,000 (Q)
DIBENZOFURAN	132-64-9	1,700	ID	6,700,000	ID	ID	2,900,000	ID
DI-N-BUTYLPHTHALATE	84-74-2	11000	960,000	3.30E+09	2.70E+07	2.7E+6 (C)	1.50E+09	8.7E+7 (C)
FLUORANTHENE	206-44-0	5,500	730,000	9.3E+09	4.6E+07	730,000	4.1E+09	1.3E+08
FLUORENE	86-73-7	5,300	390,000	9.3E+09	2.7E+07	890,000	4.1E+09	8.7E+07
INDENO(1,2,3-CD)PYRENE	193-39-5	NLL	NLL	ID	20,000	NLL	ID	80,000
NAPHTHALENE (SVOC)	91-20-3S	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07
PHENANTHRENE	85-01-8	2,100	56,000	6,700,000	1,600,000	160,000	2,900,000	5,200,000
PYRENE	129-00-0	ID	480,000	6.7E+09	2.9E+07	480,000	2.9E+09	8.4E+07
Organics - VOCs (ug/kg)								
1,2,3-TRIMETHYLBENZENE	526-73-8	NA	NA	NA	NA	NA	NA	NA
1,2,4-TRIMETHYLBENZENE	95-63-6	570 (I)	2,100 (I)	8.2E+10 (I)	3.2E+07 (C,I)	2,100 (I)	3.6E+10 (I)	1E+08 (C,I)
1,3,5-TRIMETHYLBENZENE	108-67-8	1,100 (I)	1,800 (I)	8.2E+10 (I)	3.2E+07 (C,I)	1,800 (I)	3.6E+10 (I)	1E+08 (C,I)
2-METHYLNAPHTHALENE (VOC)	91-57-6V	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07
BENZENE	71-43-2	240 (I,X)	100 (I)	3.8E+08 (I)	180,000 (I)	100 (I)	4.7E+08 (I)	840,000 (C,I)
CYCLOHEXANE	110-82-7	NA	NA	NA	NA	NA	NA	NA
ETHYLBENZENE	100-41-4	360 (I)	1,500 (I)	1E+10 (I)	2.2E+07 (C,I)	1,500 (I)	1.3E+10 (I)	7.1E+07 (C, I)
HEXANE	110-54-3	NA	1.8E+05 (C)	1.30E+10	9.2E+07 (C)	5.1E+5 (C)	5.90E+09	3.0E+8 (C)

Geographic Location	QUINCY STAMP MILLS AREA														QUINCY RECLAMATION PLANT AREA									
Station Name	SS-15 (MDEQ 2013)				SS-16 (MDEQ 2013)				TM-S1-02		TM-S1-05		TM-S2-02		MasonB-10		MS-S1-12		MS-S1-13		QMCM-SB09			
Field Sample ID	E3PS6 & ME3PS6		SS-15		E3PS7 & ME3PS7		SS-16		TMS1-2		TMS1-5		TMS2-2		Mason XRF10		MSS1-12		MSS1-13		QMCM-SB 09-0-6"		QMCM-SB 09-6"-4'	
Sample Date	09/11/13		09/11/13		09/11/13		09/11/13		09/12/07		09/12/07		09/12/07		09/06/07		09/12/07		09/12/07		05/20/17		05/20/17	
Sample Interval (bgs)	0 - 6 in		6 - 6 in		0 - 10 in		6 - 6 in		0 - 0 ft		0 - 0 ft		0 - 0 ft		0 - 0 in		0 - 0 ft		0 - 0 ft		0 - 0.5 ft		0.5 - 4 ft	
Sample Description	Moist, brown, silty, fine sand with lots of organics, glass, plastic, metal and wood pieces		Moist, brown, silty, fine sand with lots of organics, glass, plastic, metal and wood pieces		Moist, black, fine to coarse stamp sand, sand, and coal		Moist, black, fine to coarse stamp sand, sand, and coal		–		–		–		–		–		–		TOPSOIL to 6 in		SAND, Fine to medium, gray to 5 ft; saturated at 4 ft	
	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)																								
1,1'-BIPHENYL	<240 U	–	–	–	<180 U	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2-METHYLNAPHTHALENE (SVOC)	<240 U	–	–	–	**210**	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	<590 U	–	<580 U	–
ACENAPHTHENE	<240 U	–	–	–	<180 U	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	<230 U	–	<230 U	–
ACENAPHTHYLENE	**64 J**	–	–	–	<180 U	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	<230 U	–	<230 U	–
ACETOPHENONE	**280**	–	–	–	<180 U	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ANTHRACENE	**64 J**	–	–	–	<180 U	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	<230 U	–	<230 U	–
BENZO(A)ANTHRACENE	**180 J**	–	–	–	**120 J**	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	<230 U	–	<230 U	–
BENZO(A)PYRENE	**160 J**	–	–	–	**95 J**	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	<470 UJ	–	<460 U	–
BENZO(B)FLUORANTHENE	**270**	–	–	–	**180 J**	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	<470 U	–	<460 U	–
BENZO(G,H,I)PERYLENE	**120 J**	–	–	–	**88 J**	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	<470 UJ	–	<460 UJ	–
BENZO(K)FLUORANTHENE	**120 J**	–	–	–	**77 J**	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	<470 U	–	<460 U	–
BIS(2-ETHYLHEXYL)PHTHALATE	**410**	–	–	–	<180 U	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CARBAZOLE	<240 U	–	–	–	<180 U	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CHRYSENE	**200 J**	–	–	–	**150 J**	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	<230 U	–	<230 U	–
DIBENZO(A,H)ANTHRACENE	<240 U	–	–	–	<180 U	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	<470 U	–	<460 U	–
DIBENZOFURAN	<240 U	–	–	–	**70 J**	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DI-N-BUTYLPHTHALATE	**150 J**	–	–	–	**98 J**	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
FLUORANTHENE	**350**	–	–	–	**240**	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	**270**	–	**290**	–
FLUORENE	<240 U	–	–	–	<180 U	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	<230 U	–	<230 U	–
INDENO(1,2,3-CD)PYRENE	**120 J**	–	–	–	**85 J**	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	<470 U	–	<460 U	–
NAPHTHALENE (SVOC)	<240 U	–	–	–	**150 J**	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	<230 U	–	<230 U	–
PHENANTHRENE	**170 J**	–	–	–	**220**	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	<230 U	–	<230 U	–
PYRENE	**400**	–	–	–	**240**	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	<230 U	–	**230**	–
Organics - VOCs (ug/kg)																								
1,2,3-TRIMETHYLBENZENE	–	–	<68 UJ	–	–	–	**78**	–	–	–	–	–	–	–	–	–	–	–	–	–	<67 U	–	<71 U	–
1,2,4-TRIMETHYLBENZENE	–	–	<68 UJ	–	–	–	**94**	–	–	–	–	–	–	–	–	–	–	–	–	–	<67 U	–	<71 U	–
1,3,5-TRIMETHYLBENZENE	–	–	<68 UJ	–	–	–	<58 U	–	–	–	–	–	–	–	–	–	–	–	–	–	<67 U	–	<71 U	–
2-METHYLNAPHTHALENE (VOC)	–	–	<340 UJ	–	–	–	**330 J**	–	–	–	–	–	–	–	–	–	–	–	–	–	<330 U	–	<350 U	–
BENZENE	–	–	<68 UJ	–	–	–	<58 U	–	–	–	–	–	–	–	–	–	–	–	–	–	<67 U	–	<71 U	–
CYCLOHEXANE	–	–	<340 UJ	–	–	–	<290 U	–	–	–	–	–	–	–	–	–	–	–	–	–	<330 U	–	<350 U	–
ETHYLBENZENE	–	–	<68 UJ	–	–	–	<58 U	–	–	–	–	–	–	–	–	–	–	–	–	–	<67 U	–	<71 U	–
HEXANE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	<67 U	–	<71 U	–

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Screening criteria

Parameter	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria
Organics - VOCs (ug/kg) (continued)								
ISOPROPYLBENZENE	98-82-8	3,200	91,000	5.8E+09	2.5E+07 (C)	260,000	2.6E+09	8E+07 (C)
M,P-XYLENE	1330-20-7	NA	NA	NA	NA	NA	NA	NA
METHYLENE CHLORIDE	75-09-2	30,000 (X)	100	6.60E+09	1.30E+06	100	8.30E+09	5.8E+6 (C)
NAPHTHALENE (VOC)	91-20-3V	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07
N-BUTYLBENZENE	104-51-8	ID	1,600	2E+09	2,500,000	4,600	8.8E+08	8,000,000
N-PROPYLBENZENE	103-65-1	ID	1,600 (I)	1.3E+09 (I)	2,500,000 (I)	4,600 (I)	5.9E+08 (I)	8,000,000 (I)
O-XYLENE	95-47-6	NA	NA	NA	NA	NA	NA	NA
P-ISOPROPYL TOLUENE (p-CYMENE)	99-87-6	NA	NA	NA	NA	NA	NA	NA
SEC-BUTYLBENZENE	135-98-8	ID	1,600	4.00E+08	2.50E+06	1,600	1.80E+08	8.00E+06
TOLUENE	108-88-3	5,400 (I)	16,000 (I)	2.7E+10 (I)	5E+07 (C,I)	16,000 (I)	1.2E+10 (I)	1.6E+08 (C,I)
XYLENE - TOTAL	1330-20-7	820 (I)	5,600 (I)	2.9E+11 (I)	4.1E+08 (C,I)	5600 (I)	1.3E+11 (I)	1E+09 (I)
Organics - Pesticides (ug/kg)								
4,4'-DDD	72-54-8	NLL	NLL	4.40E+07	95,000	NLL	5.60E+07	4.00E+05
4,4'-DDE	72-55-9	NLL	NLL	3.20E+07	45,000	NLL	4.00E+07	1.90E+05
4,4'-DDT	50-29-3	NLL	NLL	3.20E+07	57,000	NLL	4.00E+07	2.80E+05
ALDRIN	309-00-2	NLL	NLL	6.40E+05	1,000	NLL	8.00E+05	4,300
ALPHA-BHC	319-84-6	ID	18	1.70E+06	2,600	71	2.10E+06	12,000
ALPHA-CHLORODANE	5103-71-9	NA	NA	NA	NA	NA	NA	NA
BETA-BHC	319-85-7	ID	37	5.90E+06	5,400	150	7.40E+06	25,000
DIELDRIN	60-57-1	NLL	NLL	6.80E+05	1,100	NLL	8.50E+05	4,700
ENDOSULFAN I	959-98-8	NA	NA	NA	NA	NA	NA	NA
ENDOSULFAN II	33213-65-9	NA	NA	NA	NA	NA	NA	NA
ENDOSULFAN SULFATE	1031-07-8	NA	NA	NA	NA	NA	NA	NA
ENDRIN	72-20-8	NLL	NLL	ID	65,000	NLL	ID	1.90E+05
ENDRIN ALDEHYDE	7421-93-4	NA	NA	NA	NA	NA	NA	NA
ENDRIN KETONE	53494-70-5	NA	NA	NA	NA	NA	NA	NA
GAMMA-CHLORDANE	5103-74-2	NA	NA	NA	NA	NA	NA	NA
HEPTACHLOR EPOXIDE	102-457-3	NLL	NLL	1.20E+06	3,100	NLL	1.50E+06	9,500
METHOXYCHLOR	72-43-5	NA	16,000	ID	1.90E+06	16,000	ID	5.60E+06
Asbestos (%)								
ASBESTOS	ASB	NLL	NLL	1% (1.0E+7 (M); 68,000 ppb)	ID	NLL	1% (1.0E+7 (M); 85,000 ppb)	ID

QUINCY STAMP MILLS AREA

Geographic Location / Station Name	SS-15 (MDEQ 2013)				SS-16 (MDEQ 2013)				TM-S1-02		TM-S1-05		TM-S2-02	
Field Sample ID	E3PS6 & ME3PS6		SS-15		E3PS7 & ME3PS7		SS-16		TMS1-2		TMS1-5		TMS2-2	
Sample Date	09/11/13		09/11/13		09/11/13		09/11/13		09/12/07		09/12/07		09/12/07	
Sample Interval (bgs)	0 - 6 in		6 - 6 in		0 - 10 in		6 - 6 in		0 - 0 ft		0 - 0 ft		0 - 0 ft	
Sample Description	Moist, brown, silty, fine sand with lots of organics, glass, plastic, metal and wood pieces		Moist, brown, silty, fine sand with lots of organics, glass, plastic, metal and wood pieces		Moist, black, fine to coarse stamp sand, sand, and coal		Moist, black, fine to coarse stamp sand, sand, and coal		–		–		–	
	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Organics - VOCs (ug/kg) (continued)														
ISOPROPYLBENZENE	–	–	<68 UJ	–	–	–	<58 U	–	–	–	–	–	–	–
M,P-XYLENE	–	–	<140 UJ	–	–	–	**290**	–	–	–	–	–	–	–
METHYLENE CHLORIDE	–	–	<340 UJ	–	–	–	<290 U	–	–	–	–	–	–	–
NAPHTHALENE (VOC)	–	–	<340 U	–	–	–	**360**	–	–	–	–	–	–	–
N-BUTYLBENZENE	–	–	<68 UJ	–	–	–	<58 U	–	–	–	–	–	–	–
N-PROPYLBENZENE	–	–	<68 UJ	–	–	–	<58 U	–	–	–	–	–	–	–
O-XYLENE	–	–	<68 UJ	–	–	–	**200**	–	–	–	–	–	–	–
P-ISOPROPYL TOLUENE (p-CYMENE)	–	–	<68 UJ	–	–	–	<58 U	–	–	–	–	–	–	–
SEC-BUTYLBENZENE	–	–	<68 UJ	–	–	–	<58 U	–	–	–	–	–	–	–
TOLUENE	–	–	<68 UJ	–	–	–	**300**	–	–	–	–	–	–	–
XYLENE - TOTAL	–	–	ND	–	–	–	**490**	–	–	–	–	–	–	–
Organics - Pesticides (ug/kg)														
4,4'-DDD	<4.7 U	–	–	–	<3.5 U	–	–	–	–	–	–	–	–	–
4,4'-DDE	<4.7 U	–	–	–	<3.5 U	–	–	–	–	–	–	–	–	–
4,4'-DDT	**42**	–	–	–	<3.5 U	–	–	–	–	–	–	–	–	–
ALDRIN	<2.4 U	–	–	–	<1.8 U	–	–	–	–	–	–	–	–	–
ALPHA-BHC	<2.4 U	–	–	–	<1.8 U	–	–	–	–	–	–	–	–	–
ALPHA-CHLORODANE	<2.4 U	–	–	–	<1.8 U	–	–	–	–	–	–	–	–	–
BETA-BHC	<2.4 U	–	–	–	<1.8 U	–	–	–	–	–	–	–	–	–
DIELDRIN	**5.2 J**	–	–	–	<3.5 U	–	–	–	–	–	–	–	–	–
ENDOSULFAN I	<2.4 U	–	–	–	<1.8 U	–	–	–	–	–	–	–	–	–
ENDOSULFAN II	<4.7 U	–	–	–	<3.5 U	–	–	–	–	–	–	–	–	–
ENDOSULFAN SULFATE	**16 J**	–	–	–	<3.5 U	–	–	–	–	–	–	–	–	–
ENDRIN	<4.7 U	–	–	–	<3.5 U	–	–	–	–	–	–	–	–	–
ENDRIN ALDEHYDE	**13 J**	–	–	–	<3.5 U	–	–	–	–	–	–	–	–	–
ENDRIN KETONE	**5.1 J**	–	–	–	<3.5 U	–	–	–	–	–	–	–	–	–
GAMMA-CHLORDANE	<2.4 U	–	–	–	<1.8 U	–	–	–	–	–	–	–	–	–
HEPTACHLOR EPOXIDE	<2.4 U	–	–	–	<1.8 U	–	–	–	–	–	–	–	–	–
METHOXYCHLOR	<24 U	–	–	–	<18 U	–	–	–	–	–	–	–	–	–
Asbestos (%)														
ASBESTOS	–	–	–	–	–	–	–	–	–	–	–	–	–	–

QUINCY RECLAMATION PLANT AREA

Geographic Location / Station Name	MasonB-10		MS-S1-12		MS-S1-13		QMCM-SB09			
Field Sample ID	Mason XRF10		MSS1-12		MSS1-13		QMCM-SB 09-0-6"		QMCM-SB 09-6"-4'	
Sample Date	09/06/07		09/12/07		09/12/07		05/20/17		05/20/17	
Sample Interval (bgs)	0 - 0 in		0 - 0 ft		0 - 0 ft		0 - 0.5 ft		0.5 - 4 ft	
Sample Description	–		–		–		TOPSOIL to 6 in		SAND, Fine to medium, gray to 5 ft; saturated at 4 ft	
	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Organics - VOCs (ug/kg) (continued)										
ISOPROPYLBENZENE	–	–	–	–	–	–	<67 U	–	<71 U	–
M,P-XYLENE	–	–	–	–	–	–	<130 U	–	<140 U	–
METHYLENE CHLORIDE	–	–	–	–	–	–	<130 U	–	<140 U	–
NAPHTHALENE (VOC)	–	–	–	–	–	–	<330 U	–	<350 U	–
N-BUTYLBENZENE	–	–	–	–	–	–	<67 U	–	<71 U	–
N-PROPYLBENZENE	–	–	–	–	–	–	<67 U	–	<71 U	–
O-XYLENE	–	–	–	–	–	–	<67 U	–	<71 U	–
P-ISOPROPYL TOLUENE (p-CYMENE)	–	–	–	–	–	–	–	–	–	–
SEC-BUTYLBENZENE	–	–	–	–	–	–	<67 U	–	<71 U	–
TOLUENE	–	–	–	–	–	–	<67 U	–	<71 U	–
XYLENE - TOTAL	–	–	–	–	–	–	ND	–	ND	–
Organics - Pesticides (ug/kg)										
4,4'-DDD	–	–	–	–	–	–	–	–	–	–
4,4'-DDE	–	–	–	–	–	–	–	–	–	–
4,4'-DDT	–	–	–	–	–	–	–	–	–	–
ALDRIN	–	–	–	–	–	–	–	–	–	–
ALPHA-BHC	–	–	–	–	–	–	–	–	–	–
ALPHA-CHLORODANE	–	–	–	–	–	–	–	–	–	–
BETA-BHC	–	–	–	–	–	–	–	–	–	–
DIELDRIN	–	–	–	–	–	–	–	–	–	–
ENDOSULFAN I	–	–	–	–	–	–	–	–	–	–
ENDOSULFAN II	–	–	–	–	–	–	–	–	–	–
ENDOSULFAN SULFATE	–	–	–	–	–	–	–	–	–	–
ENDRIN	–	–	–	–	–	–	–	–	–	–
ENDRIN ALDEHYDE	–	–	–	–	–	–	–	–	–	–
ENDRIN KETONE	–	–	–	–	–	–	–	–	–	–
GAMMA-CHLORDANE	–	–	–	–	–	–	–	–	–	–
HEPTACHLOR EPOXIDE	–	–	–	–	–	–	–	–	–	–
METHOXYCHLOR	–	–	–	–	–	–	–	–	–	–
Asbestos (%)										
ASBESTOS	–	–	–	–	–	–	–	–	–	–

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

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location / Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria
Inorganics - Metals (mg/kg)								
ALUMINUM	7429-90-5	NA	6,900 (B)	ID	50,000 (DD)	6,900 (B)	ID	370,000 (DD)
ANTIMONY	7440-36-0	1.2 (X)	4.3	13,000	180	4.3	5,900	670
ARSENIC	7440-38-2	4.6	4.6	720	7.6	4.6	910	37
BARIUM	7440-39-3	130	1,300 (G)	330,000	37,000	1,300	150,000	130,000
BERYLLIUM	7440-41-7	4.6 (G)	51	1,300	410	51	590	1,600
CADMIUM	7440-43-9	1.6 (G,X)	6.0	1,700	550	6.0	2,200	2,100
CALCIUM	7440-70-2	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	7440-47-3	1,200,000 (G,H,X)	1,000,000 (D,H)	330,000 (H)	790,000 (H)	1,000,000 (D,H)	150,000 (H)	1,000,000 (D,H)
COBALT	7440-48-4	2.0	0.8	13,000	2,600	2.0	5,900	9,000
COPPER	7440-50-8	32 (G)	5,800	130,000	20,000	5,800	59,000	73,000
IRON	7439-89-6	NA	12,000 (B)	ID	160,000	12,000 (B)	ID	580,000
LEAD	7439-92-1	1,900 (G,X)	700	100,000	400	700	44,000	900 (DD)
LITHIUM	7439-93-2	9.8 (B)	9.8 (B)	2,300,000	4,200 (DD)	9.8 (B)	1,000,000	31,000 (DD)
MAGNESIUM	7439-95-4	NA	8,000	6,700,000	1,000,000 (D)	22,000	2,900,000	1,000,000 (D)
MANGANESE	7439-96-5	440 (B,G,X)	440 (B)	3,300	25,000	440 (B)	1,500	90,000
MERCURY	7439-97-6	0.13 (B, Z)	1.7 (Z)	20000 (Z)	160 (Z)	1.7 (Z)	8800 (Z)	580 (Z)
NICKEL	7440-02-0	29 (G)	100	13,000	40,000	100	16,000	150,000
POTASSIUM	7440-09-7	NA	NA	NA	NA	NA	NA	NA
SELENIUM	7782-49-2	0.41 (B)	4.0	130,000	2,600	4.0	59,000	9,600
SILVER	7440-22-4	1.0 (M); 0.027	4.5	6,700	2,500	13	2,900	9,000
SODIUM	7440-23-5	NA	NA	NA	NA	NA	NA	NA
THALLIUM	7440-28-0	1.4	2.3	13,000	35	2.3	5,900	130
VANADIUM	7440-62-2	430	72	ID	750 (DD)	990	ID	5,500 (DD)
ZINC	7440-66-6	62 (G)	2,400	ID	170,000	5,000	ID	630,000
Inorganics - Cyanide (mg/kg)								
CYANIDE	57-12-5	0.1 (P,R)	4.0 (P,R)	250 (P,R)	12 (P,R)	4.0 (P,R)	250 (P,R)	250 (P,R)
Organics - PCBs (ug/kg)								
AROCLOR-1260	11096-82-5	NA	NA	NA	NA	NA	NA	NA
AROCLOR-1262	37324-23-5	NA	NA	NA	NA	NA	NA	NA
TOTAL PCBS	TPCB	NLL	NLL	5,200,000 (J)	1,000 (J,T)	NLL	6,500,000 (J)	1,000 (J,T)

Geographic Location	QUINCY RECLAMATION PLANT AREA																					
Station Name	QMCM-SB24						QMCM-SB25				QMCM-SB26				QMCM-SB27				QMCM-SB28			
Field Sample ID	QMCM-SB 24 0-6"		QMCM-SB 24 6"-4'		QMCM-SB 24 6"-4' dup		QMCM-SB 25 0-6"		QMCM-SB 25 6"-4'		QMCM-SB 26 0-6"		QMCM-SB 26 6"-4'		QMCM-SB 27-0-6"		QMCM-SB 27-6"-4'		QMCM-SB 28-0-6"		QMCM-SB 28-6"-4'	
Sample Date	05/19/17		05/19/17		05/19/17		05/19/17		05/19/17		05/19/17		05/19/17		05/19/17		05/19/17		05/19/17		05/19/17	
Sample Interval (bgs)	0 - 0.5 ft		0.5 - 4 ft		0.5 - 4 ft		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 - 0.5 ft		0.5 - 4 ft	
Sample Description	ROAD GRAVEL to 6 in		SAND, Fine to medium, brown to 5 ft; saturated at 4.5 ft		Field Duplicate		SILTY SAND, Fine, gray to 1 ft		SAND, Fine to medium, brown to 5 ft; saturated at 4 ft		SILTY SAND, Fine, gray to 1 ft		SAND, Fine to medium, brown to 5 ft; saturated at 4.5 ft		SILTY SAND, Fine, gray to 1 ft		SAND, Fine to medium, brown to 5 ft; saturated at 4.5 ft		SILTY SAND, Fine, gray to 1 ft		SAND, Fine to medium, brown to 5ft; saturated at 4.5 ft	
	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	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ANTIMONY	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ARSENIC	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BARIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BERYLLIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CADMIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CALCIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CHROMIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
COBALT	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
COPPER	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
IRON	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
LEAD	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
LITHIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MAGNESIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MANGANESE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MERCURY	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
NICKEL	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
POTASSIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SELENIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SILVER	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SODIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
THALLIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
VANADIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ZINC	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Inorganics - Cyanide (mg/kg)																						
CYANIDE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Organics - PCBs (ug/kg)																						
AROCLOR-1260	<110 U	–	<110 U	–	<110 U	–	<110 U	–	<110 U	–	<120 U	–	<110 U	–	<110 U	–	<110 U	–	<110 U	–	<110 U	–
AROCLOR-1262	<110 U	–	<110 U	–	<110 U	–	<110 U	–	<110 U	–	<120 U	–	<110 U	–	<110 U	–	<110 U	–	<110 U	–	<110 U	–
TOTAL PCBS	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY RECLAMATION PLANT AREA																					
Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	QMCM-SB24						QMCM-SB25				QMCM-SB26				QMCM-SB27				QMCM-SB28			
Field Sample ID									QMCM-SB 24 0-6"		QMCM-SB 24 6"-4'		QMCM-SB 24 6"-4' dup		QMCM-SB 25 0-6"		QMCM-SB 25 6"-4'		QMCM-SB 26 0-6"		QMCM-SB 26 6"-4'		QMCM-SB 27-0-6"		QMCM-SB 27-6"-4'		QMCM-SB 28-0-6"		QMCM-SB 28-6"-4'	
Sample Date									05/19/17		05/19/17		05/19/17		05/19/17		05/19/17		05/19/17		05/19/17		05/19/17		05/19/17		05/19/17		05/19/17	
Sample Interval (bgs)									0 - 0.5 ft		0.5 - 4 ft		0.5 - 4 ft		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 - 0.5 ft		0.5 - 4 ft	
Sample Description									ROAD GRAVEL to 6 in		SAND, Fine to medium, brown to 5 ft; saturated at 4.5 ft		Field Duplicate		SILTY SAND, Fine, gray to 1 ft		SAND, Fine to medium, brown to 5 ft; saturated at 4 ft		SILTY SAND, Fine, gray to 1 ft		SAND, Fine to medium, brown to 5 ft; saturated at 4.5 ft		SILTY SAND, Fine, gray to 1 ft		SAND, Fine to medium, brown to 5 ft; saturated at 4.5 ft		SILTY SAND, Fine, gray to 1 ft		SAND, Fine to medium, brown to 5ft; saturated at 4.5 ft	
									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)																														
1,1'-BIPHENYL	92-52-4	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-METHYLNAPHTHALENE (SVOC)	91-57-6S	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ACENAPHTHENE	83-32-9	8,700	300,000	1.4E+10	4.1E+07	880,000	6.2E+09	1.3E+08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ACENAPHTHYLENE	208-96-8	ID	5,900	2.3E+09	1,600,000	17,000	1E+09	5,200,000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ACETOPHENONE	98-86-2	ID	30,000	3.3E+10	4.7E+07 (C)	88,000	1.4E+10	1.5E+08 (C)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ANTHRACENE	120-12-7	ID	41,000	6.7E+10	2.3E+08	41,000	2.9E+10	7.3E+08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BENZO(A)ANTHRACENE	56-55-3	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BENZO(A)PYRENE	50-32-8	NLL	NLL	1,500,000 (Q)	2,000 (Q)	NLL	1,900,000 (Q)	8,000 (Q)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BENZO(B)FLUORANTHENE	205-99-2	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BENZO(G,H,I)PERYLENE	191-24-2	NLL	NLL	8E+08 (Q)	2,500,000 (Q)	NLL	3.5E+08 (Q)	7,000,000 (Q)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BENZO(K)FLUORANTHENE	207-08-9	NLL	NLL	ID	200,000 (Q)	NLL	ID	800,000 (Q)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	NLL	NLL	7E+08	2,800,000	NLL	8.9E+08	1.2E+07 (C)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CARBAZOLE	86-74-8	1,100	9,400	6.2E+07	530,000	39,000	7.8E+07	2,400,000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHRYSENE	218-01-9	NLL	NLL	ID	2,000,000 (Q)	NLL	ID	8,000,000 (Q)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DIBENZO(A,H)ANTHRACENE	53-70-3	NLL	NLL	ID	2,000 (Q)	NLL	ID	8,000 (Q)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DIBENZOFURAN	132-64-9	1,700	ID	6,700,000	ID	ID	2,900,000	ID	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DI-N-BUTYLPHTHALATE	84-74-2	11000	960,000	3.30E+09	2.70E+07	2.7E+6 (C)	1.50E+09	8.7E+7 (C)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUORANTHENE	206-44-0	5,500	730,000	9.3E+09	4.6E+07	730,000	4.1E+09	1.3E+08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUORENE	86-73-7	5,300	390,000	9.3E+09	2.7E+07	890,000	4.1E+09	8.7E+07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
INDENO(1,2,3-CD)PYRENE	193-39-5	NLL	NLL	ID	20,000	NLL	ID	80,000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NAPHTHALENE (SVOC)	91-20-3S	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PHENANTHRENE	85-01-8	2,100	56,000	6,700,000	1,600,000	160,000	2,900,000	5,200,000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PYRENE	129-00-0	ID	480,000	6.7E+09	2.9E+07	480,000	2.9E+09	8.4E+07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Organics - VOCs (ug/kg)																														
1,2,3-TRIMETHYLBENZENE	526-73-8	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-TRIMETHYLBENZENE	95-63-6	570 (I)	2,100 (I)	8.2E+10 (I)	3.2E+07 (C,I)	2,100 (I)	3.6E+10 (I)	1E+08 (C,I)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3,5-TRIMETHYLBENZENE	108-67-8	1,100 (I)	1,800 (I)	8.2E+10 (I)	3.2E+07 (C,I)	1,800 (I)	3.6E+10 (I)	1E+08 (C,I)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-METHYLNAPHTHALENE (VOC)	91-57-6V	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BENZENE	71-43-2	240 (I,X)	100 (I)	3.8E+08 (I)	180,000 (I)	100 (I)	4.7E+08 (I)	840,000 (C,I)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CYCLOHEXANE	110-82-7	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ETHYLBENZENE	100-41-4	360 (I)	1,500 (I)	1E+10 (I)	2.2E+07 (C,I)	1,500 (I)	1.3E+10 (I)	7.1E+07 (C, I)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HEXANE	110-54-3	NA	1.8E+05 (C)	1.30E+10	9.2E+07 (C)	5.1E+5 (C)	5.90E+09	3.0E+8 (C)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY RECLAMATION PLANT AREA																					
Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	QMCM-SB24						QMCM-SB25				QMCM-SB26				QMCM-SB27				QMCM-SB28			
Field Sample ID									QMCM-SB 24 0-6"		QMCM-SB 24 6"-4'		QMCM-SB 24 6"-4' dup		QMCM-SB 25 0-6"		QMCM-SB 25 6"-4'		QMCM-SB 26 0-6"		QMCM-SB 26 6"-4'		QMCM-SB 27-0-6"		QMCM-SB 27-6"-4'		QMCM-SB 28-0-6"		QMCM-SB 28-6"-4'	
Sample Date									05/19/17		05/19/17		05/19/17		05/19/17		05/19/17		05/19/17		05/19/17		05/19/17		05/19/17		05/19/17		05/19/17	
Sample Interval (bgs)									0 - 0.5 ft		0.5 - 4 ft		0.5 - 4 ft		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 - 0.5 ft		0.5 - 4 ft	
Sample Description									ROAD GRAVEL to 6 in		SAND, Fine to medium, brown to 5 ft; saturated at 4.5 ft		Field Duplicate		SILTY SAND, Fine, gray to 1 ft		SAND, Fine to medium, brown to 5 ft; saturated at 4 ft		SILTY SAND, Fine, gray to 1 ft		SAND, Fine to medium, brown to 5 ft; saturated at 4.5 ft		SILTY SAND, Fine, gray to 1 ft		SAND, Fine to medium, brown to 5 ft; saturated at 4.5 ft		SILTY SAND, Fine, gray to 1 ft		SAND, Fine to medium, brown to 5ft; saturated at 4.5 ft	
									Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Organics - VOCs (ug/kg) (continued)																														
ISOPROPYLBENZENE	98-82-8	3,200	91,000	5.8E+09	2.5E+07 (C)	260,000	2.6E+09	8E+07 (C)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M,P-XYLENE	1330-20-7	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
METHYLENE CHLORIDE	75-09-2	30,000 (X)	100	6.60E+09	1.30E+06	100	8.30E+09	5.8E+6 (C)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
NAPHTHALENE (VOC)	91-20-3V	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
N-BUTYLBENZENE	104-51-8	ID	1,600	2E+09	2,500,000	4,600	8.8E+08	8,000,000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
N-PROPYLBENZENE	103-65-1	ID	1,600 (I)	1.3E+09 (I)	2,500,000 (I)	4,600 (I)	5.9E+08 (I)	8,000,000 (I)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
O-XYLENE	95-47-6	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P-ISOPROPYL TOLUENE (p-CYMENE)	99-87-6	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SEC-BUTYLBENZENE	135-98-8	ID	1,600	4.00E+08	2.50E+06	1,600	1.80E+08	8.00E+06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOLUENE	108-88-3	5,400 (I)	16,000 (I)	2.7E+10 (I)	5E+07 (C,I)	16,000 (I)	1.2E+10 (I)	1.6E+08 (C,I)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
XYLENE - TOTAL	1330-20-7	820 (I)	5,600 (I)	2.9E+11 (I)	4.1E+08 (C,I)	5600 (I)	1.3E+11 (I)	1E+09 (I)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Organics - Pesticides (ug/kg)																														
4,4'-DDD	72-54-8	NLL	NLL	4.40E+07	95,000	NLL	5.60E+07	4.00E+05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4,4'-DDE	72-55-9	NLL	NLL	3.20E+07	45,000	NLL	4.00E+07	1.90E+05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4,4'-DDT	50-29-3	NLL	NLL	3.20E+07	57,000	NLL	4.00E+07	2.80E+05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ALDRIN	309-00-2	NLL	NLL	6.40E+05	1,000	NLL	8.00E+05	4,300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ALPHA-BHC	319-84-6	ID	18	1.70E+06	2,600	71	2.10E+06	12,000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ALPHA-CHLORODANE	5103-71-9	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BETA-BHC	319-85-7	ID	37	5.90E+06	5,400	150	7.40E+06	25,000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DIELDRIN	60-57-1	NLL	NLL	6.80E+05	1,100	NLL	8.50E+05	4,700	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ENDOSULFAN I	959-98-8	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ENDOSULFAN II	33213-65-9	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ENDOSULFAN SULFATE	1031-07-8	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ENDRIN	72-20-8	NLL	NLL	ID	65,000	NLL	ID	1.90E+05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ENDRIN ALDEHYDE	7421-93-4	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ENDRIN KETONE	53494-70-5	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GAMMA-CHLORDANE	5103-74-2	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HEPTACHLOR EPOXIDE	102-457-3	NLL	NLL	1.20E+06	3,100	NLL	1.50E+06	9,500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
METHOXYCHLOR	72-43-5	NA	16,000	ID	1.90E+06	16,000	ID	5.60E+06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Asbestos (%)																														
ASBESTOS	ASB	NLL	NLL	1% (1.0E+7 (M); 68,000 ppb)	ID	NLL	1% (1.0E+7 (M); 85,000 ppb)	ID	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

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

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria
Inorganics - Metals (mg/kg)								
ALUMINUM	7429-90-5	NA	6,900 (B)	ID	50,000 (DD)	6,900 (B)	ID	370,000 (DD)
ANTIMONY	7440-36-0	1.2 (X)	4.3	13,000	180	4.3	5,900	670
ARSENIC	7440-38-2	4.6	4.6	720	7.6	4.6	910	37
BARIUM	7440-39-3	130	1,300 (G)	330,000	37,000	1,300	150,000	130,000
BERYLLIUM	7440-41-7	4.6 (G)	51	1,300	410	51	590	1,600
CADMIUM	7440-43-9	1.6 (G,X)	6.0	1,700	550	6.0	2,200	2,100
CALCIUM	7440-70-2	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	7440-47-3	1,200,000 (G,H,X)	1,000,000 (D,H)	330,000 (H)	790,000 (H)	1,000,000 (D,H)	150,000 (H)	1,000,000 (D,H)
COBALT	7440-48-4	2.0	0.8	13,000	2,600	2.0	5,900	9,000
COPPER	7440-50-8	32 (G)	5,800	130,000	20,000	5,800	59,000	73,000
IRON	7439-89-6	NA	12,000 (B)	ID	160,000	12,000 (B)	ID	580,000
LEAD	7439-92-1	1,900 (G,X)	700	100,000	400	700	44,000	900 (DD)
LITHIUM	7439-93-2	9.8 (B)	9.8 (B)	2,300,000	4,200 (DD)	9.8 (B)	1,000,000	31,000 (DD)
MAGNESIUM	7439-95-4	NA	8,000	6,700,000	1,000,000 (D)	22,000	2,900,000	1,000,000 (D)
MANGANESE	7439-96-5	440 (B,G,X)	440 (B)	3,300	25,000	440 (B)	1,500	90,000
MERCURY	7439-97-6	0.13 (B, Z)	1.7 (Z)	20000 (Z)	160 (Z)	1.7 (Z)	8800 (Z)	580 (Z)
NICKEL	7440-02-0	29 (G)	100	13,000	40,000	100	16,000	150,000
POTASSIUM	7440-09-7	NA	NA	NA	NA	NA	NA	NA
SELENIUM	7782-49-2	0.41 (B)	4.0	130,000	2,600	4.0	59,000	9,600
SILVER	7440-22-4	1.0 (M); 0.027	4.5	6,700	2,500	13	2,900	9,000
SODIUM	7440-23-5	NA	NA	NA	NA	NA	NA	NA
THALLIUM	7440-28-0	1.4	2.3	13,000	35	2.3	5,900	130
VANADIUM	7440-62-2	430	72	ID	750 (DD)	990	ID	5,500 (DD)
ZINC	7440-66-6	62 (G)	2,400	ID	170,000	5,000	ID	630,000
Inorganics - Cyanide (mg/kg)								
CYANIDE	57-12-5	0.1 (P,R)	4.0 (P,R)	250 (P,R)	12 (P,R)	4.0 (P,R)	250 (P,R)	250 (P,R)
Organics - PCBs (ug/kg)								
AROCLOR-1260	11096-82-5	NA	NA	NA	NA	NA	NA	NA
AROCLOR-1262	37324-23-5	NA	NA	NA	NA	NA	NA	NA
TOTAL PCBS	TPCB	NLL	NLL	5,200,000 (J)	1,000 (J,T)	NLL	6,500,000 (J)	1,000 (J,T)

Geographic Location	QUINCY RECLAMATION PLANT AREA																							
Station Name	QMCM-SB29				QMCM-SB30						QMCM-SB31				QMCM-SS41		QMCM-SS42		QMCM-SS43		QMCM-SS44			
Field Sample ID	QMCM-SB 29-0-6"		QMCM-SB 29-6"-4'		QMCM-SB 30-0-6"		QMCM-SB 30-6"-7'		QMCM-SB 30-6"-7' dup		QMCM-SB 31-9"-15"		QMCM-SB 31-15"-7'		QMCM-SS41-0"-6"		QMCM-SS42-0"-6"		QMCM-SS43-0"-6"		QMCM-SS44-0"-6"		QMCM-SS44-0"-6"-DUP	
Sample Date	05/19/17		05/19/17		05/18/17		05/18/17		05/18/17		05/18/17		05/18/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17	
Sample Interval (bgs)	0 - 0.5 ft		0.5 - 4 ft		0 - 0.5 ft		0.5 - 7 ft		0.5 - 7 ft		0.75 - 1.25 ft		1.25 - 7 ft		0 - 0.5 ft		0 - 0.5 ft		0 - 0.5 ft		0 - 0.5 ft		0 - 0.5 ft	
Sample Description	SILTY SAND, Fine, gray to 1 ft		SAND, Fine to medium, brown to 5ft; saturated at 4.5 ft		SAND, Fine to medium, light brown to 2 ft		SAND, Coarse with gravel, dark gray to 4.5 ft; SAND, Fine to medium, brown to 9 ft; saturated at 7 ft		Field Duplicate		SAND, Fine to medium, light brown to 6 ft		SAND, Fine to medium, brown to 9 ft; saturated at 7 ft		Dark brown coarse SAND; moist		Brown to red SAND; moist		Brown silty SAND; moist		Brown to red coarse SAND; moist with organics		Field Duplicate	
	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	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ANTIMONY	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ARSENIC	–	–	–	–	<0.5 U	–	2.9	–	3.1	–	0.9	–	0.8	–	5.4	[2,4,11]	2.5	–	<0.5 U	–	3.1	–	2.9	–
BARIUM	–	–	–	–	17	–	30	–	33	–	22	–	17	–	150	[2]	54	–	27	–	100	–	58	–
BERYLLIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CADMIUM	–	–	–	–	<0.2 U	–	<0.2 U	–	<0.2 U	–	<0.2 U	–	<0.2 U	–	0.6	–	0.2	–	0.3	–	0.5	–	0.3	–
CALCIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CHROMIUM	–	–	–	–	13	–	9.2	–	9.9	–	13	–	4.5	–	25	–	18	–	33	–	36	–	32	–
COBALT	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
COPPER	–	–	–	–	210	[2]	820	[2]	940	[2]	530	[2]	110	[2]	3,900	[2]	1,000	[2]	2,100	[2]	3,300	[2]	3,000	[2]
IRON	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
LEAD	–	–	–	–	6.5	–	120	–	110	–	28	–	31	–	230	–	160 J	–	9	–	150	–	57	–
LITHIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MAGNESIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MANGANESE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MERCURY	–	–	–	–	0.1	–	0.2	[2]	0.2	[2]	0.1	–	<0.06 U	–	0.3	[2]	0.1	–	0.2	[2]	0.9	[2]	0.9	[2]
NICKEL	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
POTASSIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SELENIUM	–	–	–	–	<0.2 U	–	<0.2 U	–	<0.2 U	–	<0.2 U	–	<0.2 U	–	0.4	–	<0.2 U	–	<0.2 U	–	<0.2 U	–	<0.2 U	–
SILVER	–	–	–	–	0.2	–	1.1	[2]	1.5	[2]	0.5	–	0.1	–	2.5	[2]	2.4	[2]	3.3	[2]	3.5	[2]	3.4	[2]
SODIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
THALLIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
VANADIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ZINC	–	–	–	–	26	–	35	–	43	–	25	–	24	–	360	[2]	120	[2]	350	[2]	180	[2]	120	[2]
Inorganics - Cyanide (mg/kg)																								
CYANIDE	–	–	–	–	<0.11 U	–	<0.11 U	–	<0.11 U	–	0.15	–	<0.12 U	–	–	–	–	–	–	–	–	–	–	–
Organics - PCBs (ug/kg)																								
AROCLOR-1260	<110 U	–	<110 U	–	<110 U	–	<130 U	–	<110 U	–	<110 U	–	<120 U	–	<130 U	–	<140 U	–	<130 U	–	<120 U	–	–	–
AROCLOR-1262	<110 U	–	<110 U	–	<110 U	–	<130 U	–	<110 U	–	<110 U	–	<120 U	–	<130 U	–	<140 U	–	<130 U	–	<120 U	–	–	–
TOTAL PCBS	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	–	–

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY RECLAMATION PLANT AREA																							
Station Name	CAS Number								QMCM-SB29				QMCM-SB30						QMCM-SB31				QMCM-SS41		QMCM-SS42		QMCM-SS43		QMCM-SS44			
Field Sample ID		[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	QMCM-SB 29-0-6"		QMCM-SB 29-6"-4'		QMCM-SB 30-0-6"		QMCM-SB 30-6"-7'		QMCM-SB 30-6"-7' dup		QMCM-SB 31-9"-15"		QMCM-SB 31-15"-7'		QMCM-SS41-0"-6"		QMCM-SS42-0"-6"		QMCM-SS43-0"-6"		QMCM-SS44-0"-6"		QMCM-SS44-0"-6"-DUP	
Sample Date									05/19/17		05/19/17		05/18/17		05/18/17		05/18/17		05/18/17		05/18/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17	
Sample Interval (bgs)									0 - 0.5 ft		0.5 - 4 ft		0 - 0.5 ft		0.5 - 7 ft		0.5 - 7 ft		0.75 - 1.25 ft		1.25 - 7 ft		0 - 0.5 ft		0 - 0.5 ft		0 - 0.5 ft		0 - 0.5 ft		0 - 0.5 ft	
Sample Description									SILTY SAND, Fine, gray to 1 ft		SAND, Fine to medium, brown to 5ft; saturated at 4.5 ft		SAND, Fine to medium, light brown to 2 ft		SAND, Coarse with gravel, dark gray to 4.5 ft; SAND, Fine to medium, brown to 9 ft; saturated at 7 ft		Field Duplicate		SAND, Fine to medium, light brown to 6 ft		SAND, Fine to medium, brown to 9 ft; saturated at 7 ft		Dark brown coarse SAND; moist		Brown to red SAND; moist		Brown silty SAND; moist		Brown to red coarse SAND; moist with organics		Field Duplicate	
									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)																																
1,1'-BIPHENYL	92-52-4	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-METHYLNAPHTHALENE (SVOC)	91-57-6S	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07	--	--	--	--	<560 U	--	<560 U	--	<560 U	--	<550 U	--	<580 U	--	--	--	--	--	--	--	--	--	--	--
ACENAPHTHENE	83-32-9	8,700	300,000	1.4E+10	4.1E+07	880,000	6.2E+09	1.3E+08	--	--	--	--	<220 U	--	<220 U	--	<220 U	--	<220 U	--	<230 U	--	--	--	--	--	--	--	--	--	--	--
ACENAPHTHYLENE	208-96-8	ID	5,900	2.3E+09	1,600,000	17,000	1E+09	5,200,000	--	--	--	--	<220 U	--	**260**	--	<220 U	--	<220 U	--	<230 U	--	--	--	--	--	--	--	--	--	--	--
ACETOPHENONE	98-86-2	ID	30,000	3.3E+10	4.7E+07 (C)	88,000	1.4E+10	1.5E+08 (C)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ANTHRACENE	120-12-7	ID	41,000	6.7E+10	2.3E+08	41,000	2.9E+10	7.3E+08	--	--	--	--	<220 U	--	**690**	--	<220 U	--	<220 U	--	<230 U	--	--	--	--	--	--	--	--	--	--	--
BENZO(A)ANTHRACENE	56-55-3	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)	--	--	--	--	<220 U	--	**1,700**	--	**630**	--	<220 U	--	<230 U	--	--	--	--	--	--	--	--	--	--	--
BENZO(A)PYRENE	50-32-8	NLL	NLL	1,500,000 (Q)	2,000 (Q)	NLL	1,900,000 (Q)	8,000 (Q)	--	--	--	--	<440 U	--	**1,900**	--	**1,300**	--	<440 U	--	<460 U	--	--	--	--	--	--	--	--	--	--	--
BENZO(B)FLUORANTHENE	205-99-2	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)	--	--	--	--	<440 U	--	**2,300**	--	**1,600**	--	<440 U	--	<460 U	--	--	--	--	--	--	--	--	--	--	--
BENZO(G,H,I)PERYLENE	191-24-2	NLL	NLL	8E+08 (Q)	2,500,000 (Q)	NLL	3.5E+08 (Q)	7,000,000 (Q)	--	--	--	--	<440 U	--	**1,500**	--	**1,100**	--	<440 U	--	<460 U	--	--	--	--	--	--	--	--	--	--	--
BENZO(K)FLUORANTHENE	207-08-9	NLL	NLL	ID	200,000 (Q)	NLL	ID	800,000 (Q)	--	--	--	--	<440 U	--	**700**	--	**440 J**	--	<440 U	--	<460 U	--	--	--	--	--	--	--	--	--	--	--
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	NLL	NLL	7E+08	2,800,000	NLL	8.9E+08	1.2E+07 (C)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CARBAZOLE	86-74-8	1,100	9,400	6.2E+07	530,000	39,000	7.8E+07	2,400,000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHRYSENE	218-01-9	NLL	NLL	ID	2,000,000 (Q)	NLL	ID	8,000,000 (Q)	--	--	--	--	<220 U	--	**2,000**	--	**810**	--	<220 U	--	<230 U	--	--	--	--	--	--	--	--	--	--	--
DIBENZO(A,H)ANTHRACENE	53-70-3	NLL	NLL	ID	2,000 (Q)	NLL	ID	8,000 (Q)	--	--	--	--	<440 U	--	<450 U	--	<450 U	--	<440 U	--	<460 U	--	--	--	--	--	--	--	--	--	--	--
DIBENZOFURAN	132-64-9	1,700	ID	6,700,000	ID	ID	2,900,000	ID	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DI-N-BUTYLPHTHALATE	84-74-2	11000	960,000	3.30E+09	2.70E+07	2.7E+6 (C)	1.50E+09	8.7E+7 (C)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUORANTHENE	206-44-0	5,500	730,000	9.3E+09	4.6E+07	730,000	4.1E+09	1.3E+08	--	--	--	--	<220 U	--	**4,100**	--	**1,200**	--	**300**	--	<230 U	--	--	--	--	--	--	--	--	--	--	--
FLUORENE	86-73-7	5,300	390,000	9.3E+09	2.7E+07	890,000	4.1E+09	8.7E+07	--	--	--	--	<220 U	--	**510**	--	<220 U	--	<220 U	--	<230 U	--	--	--	--	--	--	--	--	--	--	--
INDENO(1,2,3-CD)PYRENE	193-39-5	NLL	NLL	ID	20,000	NLL	ID	80,000	--	--	--	--	<440 U	--	**1,200**	--	**1,000**	--	<440 U	--	<460 U	--	--	--	--	--	--	--	--	--	--	--
NAPHTHALENE (SVOC)	91-20-3S	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	--	--	--	--	<220 U	--	<220 U	--	<220 U	--	<220 U	--	<230 U	--	--	--	--	--	--	--	--	--	--	--
PHENANTHRENE	85-01-8	2,100	56,000	6,700,000	1,600,000	160,000	2,900,000	5,200,000	--	--	--	--	<220 U	--	**4,900**	[2]	**570**	--	<220 U	--	<230 U	--	--	--	--	--	--	--	--	--	--	--
PYRENE	129-00-0	ID	480,000	6.7E+09	2.9E+07	480,000	2.9E+09	8.4E+07	--	--	--	--	<220 U	--	**5,100**	--	**1,600**	--	**300**	--	<230 U	--	--	--	--	--	--	--	--	--	--	--
Organics - VOCs (ug/kg)																																
1,2,3-TRIMETHYLBENZENE	526-73-8	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	<61 UJ	--	<63 U	--	<64 U	--	<59 U	--	<65 UJ	--	--	--	--	--	--	--	--	--	--	--
1,2,4-TRIMETHYLBENZENE	95-63-6	570 (I)	2,100 (I)	8.2E+10 (I)	3.2E+07 (C,I)	2,100 (I)	3.6E+10 (I)	1E+08 (C,I)	--	--	--	--	<61 UJ	--	<63 U	--	<64 U	--	<59 U	--	<65 UJ	--	--	--	--	--	--	--	--	--	--	--
1,3,5-TRIMETHYLBENZENE	108-67-8	1,100 (I)	1,800 (I)	8.2E+10 (I)	3.2E+07 (C,I)	1,800 (I)	3.6E+10 (I)	1E+08 (C,I)	--	--	--	--	<61 UJ	--	<63 U	--	<64 U	--	<59 U	--	<65 UJ	--	--	--	--	--	--	--	--	--	--	--
2-METHYLNAPHTHALENE (VOC)	91-57-6V	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07	--	--	--	--	<300 UJ	--	<320 U	--	<320 U	--	<300 U	--	<320 UJ	--	--	--	--	--	--	--	--	--	--	--
BENZENE	71-43-2	240 (I,X)	100 (I)	3.8E+08 (I)	180,000 (I)	100 (I)	4.7E+08 (I)	840,000 (C,I)	--	--	--	--	<61 UJ	--	<63 U	--	<64 U	--	<59 U	--	<65 UJ	--	--	--	--	--	--	--	--	--	--	--
CYCLOHEXANE	110-82-7	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	<300 UJ	--	<320 U	--	<320 U	--	<300 U	--	<320 UJ	--	--	--	--	--	--	--	--	--	--	--
ETHYLBENZENE	100-41-4	360 (I)	1,500 (I)	1E+10 (I)	2.2E+07 (C,I)	1,500 (I)	1.3E+10 (I)	7.1E+07 (C, I)	--	--	--	--	<61 UJ	--	<63 U	--	<64 U	--	<59 U	--	<65 UJ	--	--	--	--	--	--	--	--	--	--	--
HEXANE	110-54-3	NA	1.8E+05 (C)	1.30E+10	9.2E+07 (C)	5.1E+5 (C)	5.90E+09	3.0E+8 (C)	--	--	--	--	<61 UJ	--	<63 U	--	<64 U	--	<59 U	--	<65 UJ	--	--	--	--	--	--	--	--	--	--	--

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY RECLAMATION PLANT AREA																							
Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	QMCM-SB29				QMCM-SB30						QMCM-SB31				QMCM-SS41		QMCM-SS42		QMCM-SS43		QMCM-SS44			
Field Sample ID									QMCM-SB 29-0-6"		QMCM-SB 29-6"-4'		QMCM-SB 30-0-6"		QMCM-SB 30-6"-7'		QMCM-SB 30-6"-7' dup		QMCM-SB 31-9"-15"		QMCM-SB 31-15"-7'		QMCM-SS41-0"-6"		QMCM-SS42-0"-6"		QMCM-SS43-0"-6"		QMCM-SS44-0"-6"		QMCM-SS44-0"-6"-DUP	
Sample Date									05/19/17		05/19/17		05/18/17		05/18/17		05/18/17		05/18/17		05/18/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17	
Sample Interval (bgs)									0 - 0.5 ft		0.5 - 4 ft		0 - 0.5 ft		0.5 - 7 ft		0.5 - 7 ft		0.75 - 1.25 ft		1.25 - 7 ft		0 - 0.5 ft		0 - 0.5 ft		0 - 0.5 ft		0 - 0.5 ft		0 - 0.5 ft	
Sample Description									SILTY SAND, Fine, gray to 1 ft		SAND, Fine to medium, brown to 5ft; saturated at 4.5 ft		SAND, Fine to medium, light brown to 2 ft		SAND, Coarse with gravel, dark gray to 4.5 ft; SAND, Fine to medium, brown to 9 ft; saturated at 7 ft		Field Duplicate		SAND, Fine to medium, light brown to 6 ft		SAND, Fine to medium, brown to 9 ft; saturated at 7 ft		Dark brown coarse SAND; moist		Brown to red SAND; moist		Brown silty SAND; moist		Brown to red coarse SAND; moist with organics		Field Duplicate	
									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 - VOCs (ug/kg) (continued)																																
ISOPROPYLBENZENE	98-82-8	3,200	91,000	5.8E+09	2.5E+07 (C)	260,000	2.6E+09	8E+07 (C)	--	--	--	--	<61 UJ	--	<63 U	--	<64 U	--	<59 U	--	<65 UJ	--	--	--	--	--	--	--	--	--	--	--
M,P-XYLENE	1330-20-7	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	<120 UJ	--	<130 U	--	<130 U	--	<120 U	--	<130 UJ	--	--	--	--	--	--	--	--	--	--	--
METHYLENE CHLORIDE	75-09-2	30,000 (X)	100	6.60E+09	1.30E+06	100	8.30E+09	5.8E+6 (C)	--	--	--	--	<120 UJ	--	<130 U	--	<130 U	--	<120 U	--	<130 UJ	--	--	--	--	--	--	--	--	--	--	--
NAPHTHALENE (VOC)	91-20-3V	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	--	--	--	--	<300 UJ	--	<320 U	--	<320 U	--	<300 U	--	<320 UJ	--	--	--	--	--	--	--	--	--	--	--
N-BUTYLBENZENE	104-51-8	ID	1,600	2E+09	2,500,000	4,600	8.8E+08	8,000,000	--	--	--	--	<61 UJ	--	<63 U	--	<64 U	--	<59 U	--	<65 UJ	--	--	--	--	--	--	--	--	--	--	--
N-PROPYLBENZENE	103-65-1	ID	1,600 (I)	1.3E+09 (I)	2,500,000 (I)	4,600 (I)	5.9E+08 (I)	8,000,000 (I)	--	--	--	--	<61 UJ	--	<63 U	--	<64 U	--	<59 U	--	<65 UJ	--	--	--	--	--	--	--	--	--	--	--
O-XYLENE	95-47-6	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	<61 UJ	--	<63 U	--	<64 U	--	<59 U	--	<65 UJ	--	--	--	--	--	--	--	--	--	--	--
P-ISOPROPYL TOLUENE (p-CYMENE)	99-87-6	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SEC-BUTYLBENZENE	135-98-8	ID	1,600	4.00E+08	2.50E+06	1,600	1.80E+08	8.00E+06	--	--	--	--	<61 UJ	--	<63 U	--	<64 U	--	<59 U	--	<65 UJ	--	--	--	--	--	--	--	--	--	--	--
TOLUENE	108-88-3	5,400 (I)	16,000 (I)	2.7E+10 (I)	5E+07 (C,I)	16,000 (I)	1.2E+10 (I)	1.6E+08 (C,I)	--	--	--	--	<61 UJ	--	<63 U	--	<64 U	--	<59 U	--	<65 UJ	--	--	--	--	--	--	--	--	--	--	--
XYLENE - TOTAL	1330-20-7	820 (I)	5,600 (I)	2.9E+11 (I)	4.1E+08 (C,I)	5600 (I)	1.3E+11 (I)	1E+09 (I)	--	--	--	--	ND	--	ND	--	ND	--	ND	--	ND	--	--	--	--	--	--	--	--	--	--	--
Organics - Pesticides (ug/kg)																																
4,4'-DDD	72-54-8	NLL	NLL	4.40E+07	95,000	NLL	5.60E+07	4.00E+05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4,4'-DDE	72-55-9	NLL	NLL	3.20E+07	45,000	NLL	4.00E+07	1.90E+05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4,4'-DDT	50-29-3	NLL	NLL	3.20E+07	57,000	NLL	4.00E+07	2.80E+05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ALDRIN	309-00-2	NLL	NLL	6.40E+05	1,000	NLL	8.00E+05	4,300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ALPHA-BHC	319-84-6	ID	18	1.70E+06	2,600	71	2.10E+06	12,000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ALPHA-CHLORODANE	5103-71-9	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BETA-BHC	319-85-7	ID	37	5.90E+06	5,400	150	7.40E+06	25,000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DIELDRIN	60-57-1	NLL	NLL	6.80E+05	1,100	NLL	8.50E+05	4,700	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ENDOSULFAN I	959-98-8	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ENDOSULFAN II	33213-65-9	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ENDOSULFAN SULFATE	1031-07-8	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ENDRIN	72-20-8	NLL	NLL	ID	65,000	NLL	ID	1.90E+05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ENDRIN ALDEHYDE	7421-93-4	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ENDRIN KETONE	53494-70-5	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GAMMA-CHLORDANE	5103-74-2	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HEPTACHLOR EPOXIDE	102-457-3	NLL	NLL	1.20E+06	3,100	NLL	1.50E+06	9,500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
METHOXYCHLOR	72-43-5	NA	16,000	ID	1.90E+06	16,000	ID	5.60E+06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Asbestos (%)																																
ASBESTOS	ASB	NLL	NLL	1% (1.0E+7 (M); 68,000 ppb)	ID	NLL	1% (1.0E+7 (M); 85,000 ppb)	ID	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

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

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location		[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	QUINCY RECLAMATION PLANT AREA																							
Station Name	CAS Number								QMCM-SS45		QMCM-SS46		SB-01 (MDEQ 2013)				SB-02 (MDEQ 2013)								SB-03 (MDEQ 2013)				SB-04 (MDEQ 2013)			
Field Sample ID									QMCM-SS45-0"-6"		QMCM-SS46-0"-6"		E3PS9 & ME3PS9		SB-1		E3PT0 & ME3PT0		E3PT1 & ME3PT1		SB-2		SB-2D		E3PT2 & ME3PT2		SB-3		E3PT3 & ME3PT3		SB-4	
Sample Date									05/17/17		05/17/17		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13	
Sample Interval (bgs)									0 - 0.5 ft		0 - 0.5 ft		48 - 60 in		54 - 55 in		55 - 76 in		55 - 76 in		68 - 68 in		68 - 68 in		68 - 89 in		72 - 72 in		28 - 30 in		34 - 35 in	
Sample Description									Brown SAND; moist with organics		Brown silty SAND; moist		Moist, reddish brown, medium sand.		Moist, reddish brown, medium sand.		Moist, dark purplish brown, fine to medium stamp sand with trace silt		Moist, dark purplish brown, fine to medium stamp sand with trace silt		Moist, dark purplish brown, fine to medium stamp sand with trace silt		Field Duplicate		Moist, mixed brown, dark brown, reddish brown and blackish brown, fine to medium sand with a little silt and occasional sandstone pieces		Moist, mixed brown, dark brown, reddish brown and blackish brown, fine to medium sand with a little silt and occasional sandstone pieces		Moist, brownish gray, medium sand.		Moist, brownish gray, medium sand.	
									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	6,900 (B)	ID	50,000 (DD)	6,900 (B)	ID	370,000 (DD)	–	–	–	–	3710	–	–	–	18,300	[4,11]	17,700	[4,11]	–	–	–	–	2,230	–	–	–	1650	–	–	–
ANTIMONY	7440-36-0	1.2 (X)	4.3	13,000	180	4.3	5,900	670	–	–	–	–	0.3 J	–	–	–	1.2 J	–	1.2 J	–	–	–	–	–	0.28 J	–	–	–	0.49 J	–	–	–
ARSENIC	7440-38-2	4.6	4.6	720	7.6	4.6	910	37	–	–	–	–	1.8	–	–	–	2.7	–	2.8	–	–	–	–	–	2.6	–	–	–	2.5	–	–	–
BARIUM	7440-39-3	130	1,300 (G)	330,000	37,000	1,300	150,000	130,000	–	–	–	–	33.9 J	–	–	–	<14.9 UJ	–	<15.2 UJ	–	–	–	–	–	184 J	[2]	–	–	27.6 J	–	–	–
BERYLLIUM	7440-41-7	4.6 (G)	51	1,300	410	51	590	1,600	–	–	–	–	0.14 J-	–	–	–	0.45	–	0.41	–	–	–	–	–	0.29 J-	–	–	–	0.13 J-	–	–	–
CADMIUM	7440-43-9	1.6 (G,X)	6.0	1,700	550	6.0	2,200	2,100	–	–	–	–	0.2 J	–	–	–	0.68	–	0.69	–	–	–	–	–	0.74	–	–	–	0.18 J	–	–	–
CALCIUM	7440-70-2	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	2790	–	–	–	24,500	–	31,200	–	–	–	–	–	2,360	–	–	–	633	–	–	–
CHROMIUM	7440-47-3	1,200,000 (G,H,X)	1,000,000 (D,H)	330,000 (H)	790,000 (H)	1,000,000 (D,H)	150,000 (H)	1,000,000 (D,H)	–	–	–	–	10.2	–	–	–	23.7	–	22.1	–	–	–	–	–	6	–	–	–	5.2	–	–	–
COBALT	7440-48-4	2.0	0.8	13,000	2,600	2.0	5,900	9,000	–	–	–	–	3.3 J	[2,4,11]	–	–	22.6 J	[2,4,11]	21.8 J	[2,4,11]	–	–	–	–	1.8 J	[4]	–	–	1.2 J	[4]	–	–
COPPER	7440-50-8	32 (G)	5,800	130,000	20,000	5,800	59,000	73,000	–	–	–	–	302	[2]	–	–	5,070	[2]	1,970	[2]	–	–	–	–	130	[2]	–	–	213	[2]	–	–
IRON	7439-89-6	NA	12,000 (B)	ID	160,000	12,000 (B)	ID	580,000	–	–	–	–	8,620	–	–	–	33,500	[4,11]	32,900	[4,11]	–	–	–	–	5,550	–	–	–	6,700	–	–	–
LEAD	7439-92-1	1,900 (G,X)	700	100,000	400	700	44,000	900 (DD)	–	–	–	–	20.2 J	–	–	–	13.2 J	–	13.9 J	–	–	–	–	–	114 J	–	–	–	66.1 J	–	–	–
LITHIUM	7439-93-2	9.8 (B)	9.8 (B)	2,300,000	4,200 (DD)	9.8 (B)	1,000,000	31,000 (DD)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MAGNESIUM	7439-95-4	NA	8,000	6,700,000	1,000,000 (D)	22,000	2,900,000	1,000,000 (D)	–	–	–	–	2,220	–	–	–	12,300	[4]	11,200	[4]	–	–	–	–	595	–	–	–	587	–	–	–
MANGANESE	7439-96-5	440 (B,G,X)	440 (B)	3,300	25,000	440 (B)	1,500	90,000	–	–	–	–	108	–	–	–	558	[2,4,11]	553	[2,4,11]	–	–	–	–	250	–	–	–	48.5	–	–	–
MERCURY	7439-97-6	0.13 (B, Z)	1.7 (Z)	20000 (Z)	160 (Z)	1.7 (Z)	8800 (Z)	580 (Z)	–	–	–	–	0.037 J	–	–	–	0.092 J	–	0.1	–	–	–	–	–	0.012 J	–	–	–	0.032 J	–	–	–
NICKEL	7440-02-0	29 (G)	100	13,000	40,000	100	16,000	150,000	–	–	–	–	8.7	–	–	–	32	[2]	30.5	[2]	–	–	–	–	4.4	–	–	–	3.4	–	–	–
POTASSIUM	7440-09-7	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	144 J-	–	–	–	<372 U	–	<380 U	–	–	–	–	–	133 J-	–	–	–	95.6 J-	–	–	–
SELENIUM	7782-49-2	0.41 (B)	4.0	130,000	2,600	4.0	59,000	9,600	–	–	–	–	<2.8 U	–	–	–	<2.6 U	–	<2.7 U	–	–	–	–	–	<2.8 U	–	–	–	<2.7 U	–	–	–
SILVER	7440-22-4	1.0 (M); 0.027	4.5	6,700	2,500	13	2,900	9,000	–	–	–	–	1.1	[2]	–	–	5.3	[2,4]	5.2	[2,4]	–	–	–	–	0.75 J	–	–	–	0.9	–	–	–
SODIUM	7440-23-5	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	131 J	–	–	–	166 J	–	150 J	–	–	–	–	–	81.8 J	–	–	–	47.8 J	–	–	–
THALLIUM	7440-28-0	1.4	2.3	13,000	35	2.3	5,900	130	–	–	–	–	<2 U	–	–	–	<18.6 U	–	1.9 R	–	–	–	–	–	<2 U	–	–	–	<1.9 U	–	–	–
VANADIUM	7440-62-2	430	72	ID	750 (DD)	990	ID	5,500 (DD)	–	–	–	–	16	–	–	–	86.5	[4]	84.7	[4]	–	–	–	–	11.9	–	–	–	9.6	–	–	–
ZINC	7440-66-6	62 (G)	2,400	ID	170,000	5,000	ID	630,000	–	–	–	–	41.2	–	–	–	64.7	[2]	65.2	[2]	–	–	–	–	226	[2]	–	–	46.2	–	–	–
Inorganics - Cyanide (mg/kg)																																
CYANIDE	57-12-5	0.1 (P,R)	4.0 (P,R)	250 (P,R)	12 (P,R)	4.0 (P,R)	250 (P,R)	250 (P,R)	–	–	–	–	<0.55 U	–	–	–	<0.53 U	–	<0.54 U	–	–	–	–	–	<0.54 U	–	–	–	<0.55 U	–	–	–
Organics - PCBs (ug/kg)																																
AROCLOR-1260	11096-82-5	NA	NA	NA	NA	NA	NA	NA	<170 U	–	<110 U	–	<36 U	–	–	–	<35 U	–	<36 U	–	–	–	–	–	<36 U	–	–	–	<37 U	–	–	–
AROCLOR-1262	37324-23-5	NA	NA	NA	NA	NA	NA	NA	<170 U	–	<110 U	–	<36 U	–	–	–	<35 U	–	<36 U	–	–	–	–	–	<36 U	–	–	–	<37 U	–	–	–
TOTAL PCBS	TPCB	NLL	NLL	5,200,000 (J)	1,000 (J,T)	NLL	6,500,000 (J)	1,000 (J,T)	ND	–	ND	–	ND	–	–	–	ND	–	ND	–	–	–	–	–	ND	–	–	–	ND	–	–	–

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY RECLAMATION PLANT AREA																					
Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	QMCM-SS45		QMCM-SS46		SB-01 (MDEQ 2013)				SB-02 (MDEQ 2013)								SB-03 (MDEQ 2013)				SB-04 (MDEQ 2013)			
Field Sample ID									QMCM-SS45-0"-6"		QMCM-SS46-0"-6"		E3PS9 & ME3PS9		SB-1		E3PT0 & ME3PT0		E3PT1 & ME3PT1		SB-2		SB-2D		E3PT2 & ME3PT2		SB-3		E3PT3 & ME3PT3		SB-4	
Sample Date									05/17/17		05/17/17		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13	
Sample Interval (bgs)									0 - 0.5 ft		0 - 0.5 ft		48 - 60 in		54 - 55 in		55 - 76 in		55 - 76 in		68 - 68 in		68 - 68 in		68 - 89 in		72 - 72 in		28 - 30 in		34 - 35 in	
Sample Description									Brown SAND; moist with organics		Brown silty SAND; moist		Moist, reddish brown, medium sand.		Moist, reddish brown, medium sand.		Moist, dark purplish brown, fine to medium stamp sand with trace silt		Moist, dark purplish brown, fine to medium stamp sand with trace silt		Moist, dark purplish brown, fine to medium stamp sand with trace silt		Field Duplicate		Moist, mixed brown, dark brown, reddish brown and blackish brown, fine to medium sand with a little silt and occasional sandstone pieces		Moist, mixed brown, dark brown, reddish brown and blackish brown, fine to medium sand with a little silt and occasional sandstone pieces		Moist, brownish gray, medium sand.		Moist, brownish gray, medium sand.	
									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)																																
1,1'-BIPHENYL	92-52-4	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	<190 U	–	–	–	<180 U	–	<180 U	–	–	–	–	–	<180 U	–	–	–	<190 U	–	–	–
2-METHYLNAPHTHALENE (SVOC)	91-57-6S	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07	–	–	–	–	<190 U	–	–	–	<180 U	–	<180 U	–	–	–	–	–	<180 U	–	–	–	<190 U	–	–	–
ACENAPHTHENE	83-32-9	8,700	300,000	1.4E+10	4.1E+07	880,000	6.2E+09	1.3E+08	–	–	–	–	<190 U	–	–	–	<180 U	–	<180 U	–	–	–	–	–	<180 U	–	–	–	<190 U	–	–	–
ACENAPHTHYLENE	208-96-8	ID	5,900	2.3E+09	1,600,000	17,000	1E+09	5,200,000	–	–	–	–	<190 U	–	–	–	<180 U	–	<180 U	–	–	–	–	–	<180 U	–	–	–	<190 U	–	–	–
ACETOPHENONE	98-86-2	ID	30,000	3.3E+10	4.7E+07 (C)	88,000	1.4E+10	1.5E+08 (C)	–	–	–	–	<190 U	–	–	–	<180 U	–	<180 U	–	–	–	–	–	<180 U	–	–	–	<190 U	–	–	–
ANTHRACENE	120-12-7	ID	41,000	6.7E+10	2.3E+08	41,000	2.9E+10	7.3E+08	–	–	–	–	<190 U	–	–	–	<180 U	–	<180 U	–	–	–	–	–	<180 U	–	–	–	<190 U	–	–	–
BENZO(A)ANTHRACENE	56-55-3	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)	–	–	–	–	<190 U	–	–	–	<180 U	–	<180 U	–	–	–	–	–	**65 J**	–	–	–	**40 J**	–	–	–
BENZO(A)PYRENE	50-32-8	NLL	NLL	1,500,000 (Q)	2,000 (Q)	NLL	1,900,000 (Q)	8,000 (Q)	–	–	–	–	<190 U	–	–	–	<180 U	–	<180 U	–	–	–	–	–	**65 J**	–	–	–	**50 J**	–	–	–
BENZO(B)FLUORANTHENE	205-99-2	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)	–	–	–	–	<190 U	–	–	–	<180 U	–	<180 U	–	–	–	–	–	**85 J**	–	–	–	**70 J**	–	–	–
BENZO(G,H,I)PERYLENE	191-24-2	NLL	NLL	8E+08 (Q)	2,500,000 (Q)	NLL	3.5E+08 (Q)	7,000,000 (Q)	–	–	–	–	<190 U	–	–	–	<180 U	–	<180 U	–	–	–	–	–	**50 J**	–	–	–	<190 U	–	–	–
BENZO(K)FLUORANTHENE	207-08-9	NLL	NLL	ID	200,000 (Q)	NLL	ID	800,000 (Q)	–	–	–	–	<190 U	–	–	–	<180 U	–	<180 U	–	–	–	–	–	**65 J**	–	–	–	<190 U	–	–	–
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	NLL	NLL	7E+08	2,800,000	NLL	8.9E+08	1.2E+07 (C)	–	–	–	–	**47 J**	–	–	–	**41 J**	–	**38 J**	–	–	–	–	–	<180 U	–	–	–	<190 U	–	–	–
CARBAZOLE	86-74-8	1,100	9,400	6.2E+07	530,000	39,000	7.8E+07	2,400,000	–	–	–	–	<190 U	–	–	–	<180 U	–	<180 U	–	–	–	–	–	<180 U	–	–	–	<190 U	–	–	–
CHRYSENE	218-01-9	NLL	NLL	ID	2,000,000 (Q)	NLL	ID	8,000,000 (Q)	–	–	–	–	<190 U	–	–	–	<180 U	–	<180 U	–	–	–	–	–	**82 J**	–	–	–	**71 J**	–	–	–
DIBENZO(A,H)ANTHRACENE	53-70-3	NLL	NLL	ID	2,000 (Q)	NLL	ID	8,000 (Q)	–	–	–	–	<190 U	–	–	–	<180 U	–	<180 U	–	–	–	–	–	<180 U	–	–	–	<190 U	–	–	–
DIBENZOFURAN	132-64-9	1,700	ID	6,700,000	ID	ID	2,900,000	ID	–	–	–	–	<190 U	–	–	–	<180 U	–	<180 U	–	–	–	–	–	<180 U	–	–	–	<190 U	–	–	–
DI-N-BUTYLPHTHALATE	84-74-2	11000	960,000	3.30E+09	2.70E+07	2.7E+6 (C)	1.50E+09	8.7E+7 (C)	–	–	–	–	**75 J**	–	–	–	**76 J**	–	**93 J**	–	–	–	–	–	**63 J**	–	–	–	**81 J**	–	–	–
FLUORANTHENE	206-44-0	5,500	730,000	9.3E+09	4.6E+07	730,000	4.1E+09	1.3E+08	–	–	–	–	<190 U	–	–	–	<180 U	–	<180 U	–	–	–	–	–	**140 J**	–	–	–	**81 J**	–	–	–
FLUORENE	86-73-7	5,300	390,000	9.3E+09	2.7E+07	890,000	4.1E+09	8.7E+07	–	–	–	–	<190 U	–	–	–	<180 U	–	<180 U	–	–	–	–	–	<180 U	–	–	–	<190 U	–	–	–
INDENO(1,2,3-CD)PYRENE	193-39-5	NLL	NLL	ID	20,000	NLL	ID	80,000	–	–	–	–	<190 U	–	–	–	<180 U	–	<180 U	–	–	–	–	–	**43 J**	–	–	–	<190 U	–	–	–
NAPHTHALENE (SVOC)	91-20-3S	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	–	–	–	–	<190 U	–	–	–	<180 U	–	<180 U	–	–	–	–	–	<180 U	–	–	–	<190 U	–	–	–
PHENANTHRENE	85-01-8	2,100	56,000	6,700,000	1,600,000	160,000	2,900,000	5,200,000	–	–	–	–	<190 U	–	–	–	<180 U	–	<180 U	–	–	–	–	–	**58 J**	–	–	–	<190 U	–	–	–
PYRENE	129-00-0	ID	480,000	6.7E+09	2.9E+07	480,000	2.9E+09	8.4E+07	–	–	–	–	<190 U	–	–	–	<180 U	–	<180 U	–	–	–	–	–	**130 J**	–	–	–	**64 J**	–	–	–
Organics - VOCs (ug/kg)																																
1,2,3-TRIMETHYLBENZENE	526-73-8	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	<64 U	–	–	–	–	–	<59 U	–	<54 U	–	–	–	<98 U	–	–	–	<82 U	–
1,2,4-TRIMETHYLBENZENE	95-63-6	570 (I)	2,100 (I)	8.2E+10 (I)	3.2E+07 (C,I)	2,100 (I)	3.6E+10 (I)	1E+08 (C,I)	–	–	–	–	–	–	<64 U	–	–	–	–	–	<59 U	–	<54 U	–	–	–	<98 U	–	–	–	<82 U	–
1,3,5-TRIMETHYLBENZENE	108-67-8	1,100 (I)	1,800 (I)	8.2E+10 (I)	3.2E+07 (C,I)	1,800 (I)	3.6E+10 (I)	1E+08 (C,I)	–	–	–	–	–	–	<64 U	–	–	–	–	–	<59 U	–	<54 U	–	–	–	<98 U	–	–	–	<82 U	–
2-METHYLNAPHTHALENE (VOC)	91-57-6V	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07	–	–	–	–	–	–	<320 UJ	–	–	–	–	–	<290 UJ	–	<270 UJ	–	–	–	<490 UJ	–	–	–	<410 UJ	–
BENZENE	71-43-2	240 (I,X)	100 (I)	3.8E+08 (I)	180,000 (I)	100 (I)	4.7E+08 (I)	840,000 (C,I)	–	–	–	–	–	–	<64 U	–	–	–	–	–	<59 U	–	<54 U	–	–	–	<98 U	–	–	–	<82 U	–
CYCLOHEXANE	110-82-7	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	<320 U	–	–	–	–	–	<290 U	–	<270 U	–	–	–	<490 U	–	–	–	<410 U	–
ETHYLBENZENE	100-41-4	360 (I)	1,500 (I)	1E+10 (I)	2.2E+07 (C,I)	1,500 (I)	1.3E+10 (I)	7.1E+07 (C, I)	–	–	–	–	–	–	<64 U	–	–	–	–	–	<59 U	–	<54 U	–	–	–	<98 U	–	–	–	<82 U	–
HEXANE	110-54-3	NA	1.8E+05 (C)	1.30E+10	9.2E+07 (C)	5.1E+5 (C)	5.90E+09	3.0E+8 (C)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY RECLAMATION PLANT AREA																							
Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	QMCM-SS45		QMCM-SS46		SB-01 (MDEQ 2013)				SB-02 (MDEQ 2013)								SB-03 (MDEQ 2013)				SB-04 (MDEQ 2013)			
Field Sample ID									QMCM-SS45-0"-6"		QMCM-SS46-0"-6"		E3PS9 & ME3PS9		SB-1		E3PT0 & ME3PT0		E3PT1 & ME3PT1		SB-2		SB-2D		E3PT2 & ME3PT2		SB-3		E3PT3 & ME3PT3		SB-4	
Sample Date									05/17/17		05/17/17		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13	
Sample Interval (bgs)									0 - 0.5 ft		0 - 0.5 ft		48 - 60 in		54 - 55 in		55 - 76 in		55 - 76 in		68 - 68 in		68 - 68 in		68 - 89 in		72 - 72 in		28 - 30 in		34 - 35 in	
Sample Description									Brown SAND; moist with organics		Brown silty SAND; moist		Moist, reddish brown, medium sand.		Moist, reddish brown, medium sand.		Moist, dark purplish brown, fine to medium stamp sand with trace silt		Moist, dark purplish brown, fine to medium stamp sand with trace silt		Moist, dark purplish brown, fine to medium stamp sand with trace silt		Field Duplicate		Moist, mixed brown, dark brown, reddish brown and blackish brown, fine to medium sand with a little silt and occasional sandstone pieces		Moist, mixed brown, dark brown, reddish brown and blackish brown, fine to medium sand with a little silt and occasional sandstone pieces		Moist, brownish gray, medium sand.		Moist, brownish gray, medium sand.	
									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 - VOCs (ug/kg) (continued)																																
ISOPROPYLBENZENE	98-82-8	3,200	91,000	5.8E+09	2.5E+07 (C)	260,000	2.6E+09	8E+07 (C)	–	–	–	–	–	–	<64 U	–	–	–	–	–	<59 U	–	<54 U	–	–	–	<98 U	–	–	–	<82 U	–
M,P-XYLENE	1330-20-7	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	<130 U	–	–	–	–	–	**130**	–	<110 U	–	–	–	<200 U	–	–	–	<160 U	–
METHYLENE CHLORIDE	75-09-2	30,000 (X)	100	6.60E+09	1.30E+06	100	8.30E+09	5.8E+6 (C)	–	–	–	–	–	–	<320 U	–	–	–	–	–	<290 U	–	<270 U	–	–	–	<490 U	–	–	–	<410 U	–
NAPHTHALENE (VOC)	91-20-3V	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	–	–	–	–	–	–	<320 U	–	–	–	–	–	<290 U	–	<270 U	–	–	–	<490 U	–	–	–	<410 U	–
N-BUTYLBENZENE	104-51-8	ID	1,600	2E+09	2,500,000	4,600	8.8E+08	8,000,000	–	–	–	–	–	–	<64 U	–	–	–	–	–	<59 U	–	<54 U	–	–	–	<98 U	–	–	–	<82 U	–
N-PROPYLBENZENE	103-65-1	ID	1,600 (I)	1.3E+09 (I)	2,500,000 (I)	4,600 (I)	5.9E+08 (I)	8,000,000 (I)	–	–	–	–	–	–	<64 U	–	–	–	–	–	<59 U	–	<54 U	–	–	–	<98 U	–	–	–	<82 U	–
O-XYLENE	95-47-6	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	<64 U	–	–	–	–	–	**96**	–	<54 U	–	–	–	<98 U	–	–	–	<82 U	–
P-ISOPROPYL TOLUENE (p-CYMENE)	99-87-6	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	<64 U	–	–	–	–	–	<59 U	–	<54 U	–	–	–	<98 U	–	–	–	<82 U	–
SEC-BUTYLBENZENE	135-98-8	ID	1,600	4.00E+08	2.50E+06	1,600	1.80E+08	8.00E+06	–	–	–	–	–	–	<64 U	–	–	–	–	–	<59 U	–	<54 U	–	–	–	<98 U	–	–	–	<82 U	–
TOLUENE	108-88-3	5,400 (I)	16,000 (I)	2.7E+10 (I)	5E+07 (C,I)	16,000 (I)	1.2E+10 (I)	1.6E+08 (C,I)	–	–	–	–	–	–	<64 U	–	–	–	–	–	**98**	–	<54 U	–	–	–	<98 U	–	–	–	<82 U	–
XYLENE - TOTAL	1330-20-7	820 (I)	5,600 (I)	2.9E+11 (I)	4.1E+08 (C,I)	5600 (I)	1.3E+11 (I)	1E+09 (I)	–	–	–	–	–	–	ND	–	–	–	–	–	**226**	–	ND	–	–	–	ND	–	–	–	ND	–
Organics - Pesticides (ug/kg)																																
4,4'-DDD	72-54-8	NLL	NLL	4.40E+07	95,000	NLL	5.60E+07	4.00E+05	–	–	–	–	<3.6 U	–	–	–	<3.5 U	–	<3.6 U	–	–	–	–	–	<3.6 U	–	–	–	<3.6 U	–	–	–
4,4'-DDE	72-55-9	NLL	NLL	3.20E+07	45,000	NLL	4.00E+07	1.90E+05	–	–	–	–	<3.6 U	–	–	–	<3.5 U	–	<3.6 U	–	–	–	–	–	<3.6 U	–	–	–	<3.6 U	–	–	–
4,4'-DDT	50-29-3	NLL	NLL	3.20E+07	57,000	NLL	4.00E+07	2.80E+05	–	–	–	–	<3.6 U	–	–	–	<3.5 U	–	<3.6 U	–	–	–	–	–	<3.6 U	–	–	–	<3.6 U	–	–	–
ALDRIN	309-00-2	NLL	NLL	6.40E+05	1,000	NLL	8.00E+05	4,300	–	–	–	–	<1.8 U	–	–	–	<1.8 U	–	<1.8 U	–	–	–	–	–	<1.8 U	–	–	–	<1.9 U	–	–	–
ALPHA-BHC	319-84-6	ID	18	1.70E+06	2,600	71	2.10E+06	12,000	–	–	–	–	<1.8 U	–	–	–	<1.8 U	–	<1.8 U	–	–	–	–	–	<1.8 U	–	–	–	<1.9 U	–	–	–
ALPHA-CHLORODANE	5103-71-9	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	<1.8 U	–	–	–	<1.8 U	–	<1.8 U	–	–	–	–	–	<1.8 U	–	–	–	<1.9 U	–	–	–
BETA-BHC	319-85-7	ID	37	5.90E+06	5,400	150	7.40E+06	25,000	–	–	–	–	<1.8 U	–	–	–	<1.8 U	–	<1.8 U	–	–	–	–	–	<1.8 U	–	–	–	<1.9 U	–	–	–
DIELDRIN	60-57-1	NLL	NLL	6.80E+05	1,100	NLL	8.50E+05	4,700	–	–	–	–	<3.6 U	–	–	–	<3.5 U	–	<3.6 U	–	–	–	–	–	<3.6 U	–	–	–	<3.6 U	–	–	–
ENDOSULFAN I	959-98-8	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	<1.8 U	–	–	–	<1.8 U	–	<1.8 U	–	–	–	–	–	<1.8 U	–	–	–	<1.9 U	–	–	–
ENDOSULFAN II	33213-65-9	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	<3.6 U	–	–	–	<3.5 U	–	<3.6 U	–	–	–	–	–	<3.6 U	–	–	–	<3.6 U	–	–	–
ENDOSULFAN SULFATE	1031-07-8	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	<3.6 U	–	–	–	<3.5 U	–	<3.6 U	–	–	–	–	–	<3.6 U	–	–	–	<3.6 U	–	–	–
ENDRIN	72-20-8	NLL	NLL	ID	65,000	NLL	ID	1.90E+05	–	–	–	–	<3.6 U	–	–	–	<3.5 U	–	<3.6 U	–	–	–	–	–	<3.6 U	–	–	–	<3.6 U	–	–	–
ENDRIN ALDEHYDE	7421-93-4	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	<3.6 U	–	–	–	<3.5 U	–	<3.6 U	–	–	–	–	–	<3.6 U	–	–	–	<3.6 U	–	–	–
ENDRIN KETONE	53494-70-5	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	<3.6 U	–	–	–	<3.5 U	–	<3.6 U	–	–	–	–	–	<3.6 U	–	–	–	<3.6 U	–	–	–
GAMMA-CHLORDANE	5103-74-2	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	<1.8 U	–	–	–	<1.8 U	–	<1.8 U	–	–	–	–	–	<1.8 U	–	–	–	<1.9 U	–	–	–
HEPTACHLOR EPOXIDE	102-457-3	NLL	NLL	1.20E+06	3,100	NLL	1.50E+06	9,500	–	–	–	–	<1.8 U	–	–	–	<1.8 U	–	<1.8 U	–	–	–	–	–	<1.8 U	–	–	–	<1.9 U	–	–	–
METHOXYCHLOR	72-43-5	NA	16,000	ID	1.90E+06	16,000	ID	5.60E+06	–	–	–	–	<18 U	–	–	–	<18 U	–	<18 U	–	–	–	–	–	<18 U	–	–	–	<19 U	–	–	–
Asbestos (%)																																
ASBESTOS	ASB	NLL	NLL	1% (1.0E+7 (M); 68,000 ppb)	ID	NLL	1% (1.0E+7 (M); 85,000 ppb)	ID	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

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

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY RECLAMATION PLANT AREA																					
Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	SB-09 (MDEQ 2013)				SB-10 (MDEQ 2013)				SB-11 (MDEQ 2013)				SS-01 (MDEQ 2013)				SS-02 (MDEQ 2013)							
Field Sample ID									E3PT8 & ME3PT8		SB-9		E3PT9 & ME3PT9		SB-10		E3PW0 & ME3PW0		SB-11		E3PR1 & ME3PR1		SS-1		E3PR2 & ME3PR2		E3PR3 & ME3PR3		SS-2		SS-2D	
Sample Date									09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13	
Sample Interval (bgs)									29 - 41 in		35 - 36 in		48 - 60 in		54 - 55 in		26 - 38 in		32 - 33 in		0 - 10 in		6 - 6 in		0 - 6 in		0 - 6 in		6 - 6 in		6 - 6 in	
Sample Description									Saturated, reddish brown, medium sand		Saturated, reddish brown, medium sand		Moist, reddish brown, medium sand.		Moist, reddish brown, medium sand.		Moist, brown, medium sand with discoloration at 26-38 in		Moist, brown, medium sand with discoloration at 26-38 in		Moist, brown, silty, fine to medium sand with trace silt and some organic matter (roots etc.)		Moist, brown, silty, fine to medium sand with trace silt and some organic matter (roots etc.)		Moist, dark brown, silty, fine to medium sand (stamp sands) with some debris (glass, wood, metal)		Moist, dark brown, silty, fine to medium sand (stamp sands) with some debris (glass, wood, metal)		Moist, dark brown, silty, fine to medium sand (stamp sands) with some debris (glass, wood, metal)		Field Duplicate	
									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	6,900 (B)	ID	50,000 (DD)	6,900 (B)	ID	370,000 (DD)	2,260	–	–	–	6,740	–	–	–	1,900	–	–	–	10,100	[4,11]	–	–	17,900	[4,11]	18,300	[4,11]	–	–	–	–
ANTIMONY	7440-36-0	1.2 (X)	4.3	13,000	180	4.3	5,900	670	0.29 J	–	–	–	0.36 J	–	–	–	0.41 J	–	–	–	0.4 J	–	–	–	2.9 J	[2]	1.8 J	[2]	–	–	–	–
ARSENIC	7440-38-2	4.6	4.6	720	7.6	4.6	910	37	2.4	–	–	–	1.8	–	–	–	1.8	–	–	–	5.6	[2,4,11]	–	–	6.1	[2,4,11]	4.7	[2,4,11]	–	–	–	–
BARIUM	7440-39-3	130	1,300 (G)	330,000	37,000	1,300	150,000	130,000	32 J	–	–	–	26.8 J	–	–	–	26.3 J	–	–	–	53.7 J-	–	–	–	58.4 J-	–	45 J-	–	–	–	–	–
BERYLLIUM	7440-41-7	4.6 (G)	51	1,300	410	51	590	1,600	0.17 J-	–	–	–	0.31 J-	–	–	–	0.13 J-	–	–	–	0.42 J	–	–	–	0.4	–	0.39	–	–	–	–	–
CADMIUM	7440-43-9	1.6 (G,X)	6.0	1,700	550	6.0	2,200	2,100	0.12 J	–	–	–	0.18 J	–	–	–	0.11 J	–	–	–	0.36 J	–	–	–	1.2 J	–	0.91 J	–	–	–	–	–
CALCIUM	7440-70-2	NA	NA	NA	NA	NA	NA	NA	1,070	–	–	–	9,010	–	–	–	1,070	–	–	–	12,800	–	–	–	21,000	–	22,300	–	–	–	–	–
CHROMIUM	7440-47-3	1,200,000 (G,H,X)	1,000,000 (D,H)	330,000 (H)	790,000 (H)	1,000,000 (D,H)	150,000 (H)	1,000,000 (D,H)	5.5	–	–	–	19.1	–	–	–	5.1	–	–	–	28 J	–	–	–	28.7 J	–	30.3 J	–	–	–	–	–
COBALT	7440-48-4	2.0	0.8	13,000	2,600	2.0	5,900	9,000	1.6 J	[4]	–	–	5.5 J	[2,4,11]	–	–	1.1 J	[4]	–	–	10.3 J	[2,4,11]	–	–	20.7 J	[2,4,11]	21.2 J	[2,4,11]	–	–	–	–
COPPER	7440-50-8	32 (G)	5,800	130,000	20,000	5,800	59,000	73,000	91.3	[2]	–	–	695	[2]	–	–	70	[2]	–	–	611	[2]	–	–	19,500	[2,4,11]	31,700	[2,4,10,11]	–	–	–	–
IRON	7439-89-6	NA	12,000 (B)	ID	160,000	12,000 (B)	ID	580,000	6,860	–	–	–	12,700	[4,11]	–	–	4,500	–	–	–	17,900	[4,11]	–	–	80,000	[4,11]	45,300	[4,11]	–	–	–	–
LEAD	7439-92-1	1,900 (G,X)	700	100,000	400	700	44,000	900 (DD)	39 J	–	–	–	5.1 J	–	–	–	27.3 J	–	–	–	31.8	–	–	–	292	–	198	–	–	–	–	–
LITHIUM	7439-93-2	9.8 (B)	9.8 (B)	2,300,000	4,200 (DD)	9.8 (B)	1,000,000	31,000 (DD)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MAGNESIUM	7439-95-4	NA	8,000	6,700,000	1,000,000 (D)	22,000	2,900,000	1,000,000 (D)	852	–	–	–	2,980	–	–	–	562	–	–	–	7130	–	–	–	10,600	[4]	10,900	[4]	–	–	–	–
MANGANESE	7439-96-5	440 (B,G,X)	440 (B)	3,300	25,000	440 (B)	1,500	90,000	82.5	–	–	–	157	–	–	–	49.8	–	–	–	375	–	–	–	653	[2,4,11]	571	[2,4,11]	–	–	–	–
MERCURY	7439-97-6	0.13 (B, Z)	1.7 (Z)	20000 (Z)	160 (Z)	1.7 (Z)	8800 (Z)	580 (Z)	0.027 J	–	–	–	0.038 J	–	–	–	0.023 J	–	–	–	0.035 J	–	–	–	0.18	[2]	0.26	[2]	–	–	–	–
NICKEL	7440-02-0	29 (G)	100	13,000	40,000	100	16,000	150,000	3.8	–	–	–	9.8	–	–	–	3.1 J	–	–	–	23.7 J	–	–	–	37.3 J	[2]	41.9 J	[2]	–	–	–	–
POTASSIUM	7440-09-7	NA	NA	NA	NA	NA	NA	NA	147 J-	–	–	–	295 J	–	–	–	94.8 J-	–	–	–	206 J	–	–	–	<396 U	–	<374 U	–	–	–	–	–
SELENIUM	7782-49-2	0.41 (B)	4.0	130,000	2,600	4.0	59,000	9,600	<2.9 U	–	–	–	<2.7 U	–	–	–	<2.8 U	–	–	–	<3.1 UJ	–	–	–	<27.7 UJ	–	<2.6 UJ	–	–	–	–	–
SILVER	7440-22-4	1.0 (M); 0.027	4.5	6,700	2,500	13	2,900	9,000	0.91	–	–	–	1.8	[2]	–	–	0.6 J	–	–	–	2 J+	[2]	–	–	22.6 J+	[2,4,11]	38.9 J+	[2,4,11]	–	–	–	–
SODIUM	7440-23-5	NA	NA	NA	NA	NA	NA	NA	37.6 J	–	–	–	634	–	–	–	44.1 J	–	–	–	305 J	–	–	–	243 J	–	180 J	–	–	–	–	–
THALLIUM	7440-28-0	1.4	2.3	13,000	35	2.3	5,900	130	<2.1 U	–	–	–	<1.9 U	–	–	–	<2 U	–	–	–	<2.2 UJ	–	–	–	1.9 J	–	<46.7 UJ	–	–	–	–	–
VANADIUM	7440-62-2	430	72	ID	750 (DD)	990	ID	5,500 (DD)	13	–	–	–	33.3	–	–	–	12.2	–	–	–	37.6	–	–	–	86.9	[4]	91.7	[4]	–	–	–	–
ZINC	7440-66-6	62 (G)	2,400	ID	170,000	5,000	ID	630,000	39.7	–	–	–	20.2	–	–	–	47.6	–	–	–	71.7	[2]	–	–	163	[2]	130	[2]	–	–	–	–
Inorganics - Cyanide (mg/kg)																																
CYANIDE	57-12-5	0.1 (P,R)	4.0 (P,R)	250 (P,R)	12 (P,R)	4.0 (P,R)	250 (P,R)	250 (P,R)	<0.53 U	–	–	–	<0.53 U	–	–	–	<0.55 U	–	–	–	0.26 J	[2]	–	–	<0.53 U	–	<0.53 U	–	–	–	–	–
Organics - PCBs (ug/kg)																																
AROCLOR-1260	11096-82-5	NA	NA	NA	NA	NA	NA	NA	<35 U	–	–	–	<35 U	–	–	–	<36 U	–	–	–	<36 U	–	–	–	<35 U	–	<35 U	–	–	–	–	–
AROCLOR-1262	37324-23-5	NA	NA	NA	NA	NA	NA	NA	<35 U	–	–	–	<35 U	–	–	–	<36 U	–	–	–	<36 U	–	–	–	<35 U	–	<35 U	–	–	–	–	–
TOTAL PCBS	TPCB	NLL	NLL	5,200,000 (J)	1,000 (J,T)	NLL	6,500,000 (J)	1,000 (J,T)	ND	–	–	–	ND	–	–	–	ND	–	–	–	ND	–	–	–	ND	–	ND	–	–	–	–	–

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY RECLAMATION PLANT AREA																			
Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	SB-09 (MDEQ 2013)				SB-10 (MDEQ 2013)				SB-11 (MDEQ 2013)				SS-01 (MDEQ 2013)				SS-02 (MDEQ 2013)							
Field Sample ID									E3PT8 & ME3PT8		SB-9		E3PT9 & ME3PT9		SB-10		E3PW0 & ME3PW0		SB-11		E3PR1 & ME3PR1		SS-1		E3PR2 & ME3PR2		E3PR3 & ME3PR3		SS-2		SS-2D	
Sample Date									09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13	
Sample Interval (bgs)									29 - 41 in		35 - 36 in		48 - 60 in		54 - 55 in		26 - 38 in		32 - 33 in		0 - 10 in		6 - 6 in		0 - 6 in		0 - 6 in		6 - 6 in		6 - 6 in	
Sample Description									Saturated, reddish brown, medium sand		Saturated, reddish brown, medium sand		Moist, reddish brown, medium sand.		Moist, reddish brown, medium sand.		Moist, brown, medium sand with discoloration at 26-38 in		Moist, brown, medium sand with discoloration at 26-38 in		Moist, brown, silty, fine to medium sand with trace silt and some organic matter (roots etc.)		Moist, brown, silty, fine to medium sand with trace silt and some organic matter (roots etc.)		Moist, dark brown, silty, fine to medium sand (stamp sands) with some debris (glass, wood, metal)		Moist, dark brown, silty, fine to medium sand (stamp sands) with some debris (glass, wood, metal)		Moist, dark brown, silty, fine to medium sand (stamp sands) with some debris (glass, wood, metal)		Field Duplicate	
									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)																																
1,1'-BIPHENYL	92-52-4	NA	NA	NA	NA	NA	NA	NA	<180 U	--	--	--	<180 U	--	--	--	<190 U	--	--	--	<180 U	--	--	--	<180 U	--	<180 U	--	--	--	--	--
2-METHYLNAPHTHALENE (SVOC)	91-57-6S	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07	<180 U	--	--	--	<180 U	--	--	--	<190 U	--	--	--	<180 U	--	--	--	<180 U	--	<180 U	--	--	--	--	--
ACENAPHTHENE	83-32-9	8,700	300,000	1.4E+10	4.1E+07	880,000	6.2E+09	1.3E+08	<180 U	--	--	--	<180 U	--	--	--	<190 U	--	--	--	<180 U	--	--	--	<180 U	--	<180 U	--	--	--	--	--
ACENAPHTHYLENE	208-96-8	ID	5,900	2.3E+09	1,600,000	17,000	1E+09	5,200,000	<180 U	--	--	--	<180 U	--	--	--	<190 U	--	--	--	**56 J**	--	--	--	**53 J**	--	**68 J**	--	--	--	--	--
ACETOPHENONE	98-86-2	ID	30,000	3.3E+10	4.7E+07 (C)	88,000	1.4E+10	1.5E+08 (C)	<180 U	--	--	--	<180 U	--	--	--	<190 U	--	--	--	**84 J**	--	--	--	**51 J**	--	**45 J**	--	--	--	--	--
ANTHRACENE	120-12-7	ID	41,000	6.7E+10	2.3E+08	41,000	2.9E+10	7.3E+08	<180 U	--	--	--	<180 U	--	--	--	<190 U	--	--	--	**47 J**	--	--	--	**49 J**	--	**77 J**	--	--	--	--	--
BENZO(A)ANTHRACENE	56-55-3	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)	**110 J**	--	--	--	<180 U	--	--	--	**50 J**	--	--	--	**190**	--	--	--	**200**	--	**330**	--	--	--	--	--
BENZO(A)PYRENE	50-32-8	NLL	NLL	1,500,000 (Q)	2,000 (Q)	NLL	1,900,000 (Q)	8,000 (Q)	**110 J**	--	--	--	<180 U	--	--	--	**48 J**	--	--	--	**190**	--	--	--	**160 J**	--	**250**	--	--	--	--	--
BENZO(B)FLUORANTHENE	205-99-2	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)	**160 J**	--	--	--	<180 U	--	--	--	**65 J**	--	--	--	**310**	--	--	--	**290**	--	**490**	--	--	--	--	--
BENZO(G,H,I)PERYLENE	191-24-2	NLL	NLL	8E+08 (Q)	2,500,000 (Q)	NLL	3.5E+08 (Q)	7,000,000 (Q)	**100 J**	--	--	--	<180 U	--	--	--	<190 U	--	--	--	**140 J**	--	--	--	**120 J**	--	**180 J**	--	--	--	--	--
BENZO(K)FLUORANTHENE	207-08-9	NLL	NLL	ID	200,000 (Q)	NLL	ID	800,000 (Q)	**70 J**	--	--	--	<180 U	--	--	--	**47 J**	--	--	--	**130 J**	--	--	--	**130 J**	--	**210**	--	--	--	--	--
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	NLL	NLL	7E+08	2,800,000	NLL	8.9E+08	1.2E+07 (C)	**39 J**	--	--	--	**43 J**	--	--	--	**56 J**	--	--	--	<180 U	--	--	--	<180 U	--	<180 U	--	--	--	--	--
CARBAZOLE	86-74-8	1,100	9,400	6.2E+07	530,000	39,000	7.8E+07	2,400,000	<180 U	--	--	--	<180 U	--	--	--	<190 U	--	--	--	<180 U	--	--	--	<180 U	--	**38 J**	--	--	--	--	--
CHRYSENE	218-01-9	NLL	NLL	ID	2,000,000 (Q)	NLL	ID	8,000,000 (Q)	**140 J**	--	--	--	<180 U	--	--	--	**58 J**	--	--	--	**250**	--	--	--	**240**	--	**400**	--	--	--	--	--
DIBENZO(A,H)ANTHRACENE	53-70-3	NLL	NLL	ID	2,000 (Q)	NLL	ID	8,000 (Q)	<180 U	--	--	--	<180 U	--	--	--	<190 U	--	--	--	**44 J**	--	--	--	**44 J**	--	**64 J**	--	--	--	--	--
DIBENZOFURAN	132-64-9	1,700	ID	6,700,000	ID	ID	2,900,000	ID	<180 U	--	--	--	<180 U	--	--	--	<190 U	--	--	--	<180 U	--	--	--	<180 U	--	<180 U	--	--	--	--	--
DI-N-BUTYLPHTHALATE	84-74-2	11000	960,000	3.30E+09	2.70E+07	2.7E+6 (C)	1.50E+09	8.7E+7 (C)	**82 J**	--	--	--	**82 J**	--	--	--	**91 J**	--	--	--	**89 J**	--	--	--	<180 U	--	**100 J**	--	--	--	--	--
FLUORANTHENE	206-44-0	5,500	730,000	9.3E+09	4.6E+07	730,000	4.1E+09	1.3E+08	**210**	--	--	--	<180 U	--	--	--	**99 J**	--	--	--	**430**	--	--	--	**250**	--	**570**	--	--	--	--	--
FLUORENE	86-73-7	5,300	390,000	9.3E+09	2.7E+07	890,000	4.1E+09	8.7E+07	<180 U	--	--	--	<180 U	--	--	--	<190 U	--	--	--	<180 U	--	--	--	<180 U	--	<180 U	--	--	--	--	--
INDENO(1,2,3-CD)PYRENE	193-39-5	NLL	NLL	ID	20,000	NLL	ID	80,000	**82 J**	--	--	--	<180 U	--	--	--	<190 U	--	--	--	**140 J**	--	--	--	**130 J**	--	**200**	--	--	--	--	--
NAPHTHALENE (SVOC)	91-20-3S	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	<180 U	--	--	--	<180 U	--	--	--	<190 U	--	--	--	<180 U	--	--	--	<180 U	--	<180 U	--	--	--	--	--
PHENANTHRENE	85-01-8	2,100	56,000	6,700,000	1,600,000	160,000	2,900,000	5,200,000	**100 J**	--	--	--	<180 U	--	--	--	**39 J**	--	--	--	**170 J**	--	--	--	<180 U	--	**240**	--	--	--	--	--
PYRENE	129-00-0	ID	480,000	6.7E+09	2.9E+07	480,000	2.9E+09	8.4E+07	**210**	--	--	--	<180 U	--	--	--	**91 J**	--	--	--	**350**	--	--	--	**210**	--	**440**	--	--	--	--	--
Organics - VOCs (ug/kg)																																
1,2,3-TRIMETHYLBENZENE	526-73-8	NA	NA	NA	NA	NA	NA	NA	--	--	<70 U	--	--	--	<80 U	--	--	--	<82 U	--	--	--	<64 U	--	--	--	--	--	<59 U	--	<60 U	--
1,2,4-TRIMETHYLBENZENE	95-63-6	570 (I)	2,100 (I)	8.2E+10 (I)	3.2E+07 (C,I)	2,100 (I)	3.6E+10 (I)	1E+08 (C,I)	--	--	<70 U	--	--	--	<80 U	--	--	--	<82 U	--	--	--	<64 U	--	--	--	--	--	<59 U	--	<60 U	--
1,3,5-TRIMETHYLBENZENE	108-67-8	1,100 (I)	1,800 (I)	8.2E+10 (I)	3.2E+07 (C,I)	1,800 (I)	3.6E+10 (I)	1E+08 (C,I)	--	--	<70 U	--	--	--	<80 U	--	--	--	<82 U	--	--	--	<64 U	--	--	--	--	--	<59 U	--	<60 U	--
2-METHYLNAPHTHALENE (VOC)	91-57-6V	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07	--	--	<350 UJ	--	--	--	<400 UJ	--	--	--	<410 UJ	--	--	--	<320 U	--	--	--	--	--	<290 U	--	<300 U	--
BENZENE	71-43-2	240 (I,X)	100 (I)	3.8E+08 (I)	180,000 (I)	100 (I)	4.7E+08 (I)	840,000 (C,I)	--	--	<70 U	--	--	--	<80 U	--	--	--	<82 U	--	--	--	<64 U	--	--	--	--	--	<59 U	--	<60 U	--
CYCLOHEXANE	110-82-7	NA	NA	NA	NA	NA	NA	NA	--	--	<350 U	--	--	--	<400 U	--	--	--	<410 U	--	--	--	<320 U	--	--	--	--	--	<290 U	--	<300 U	--
ETHYLBENZENE	100-41-4	360 (I)	1,500 (I)	1E+10 (I)	2.2E+07 (C,I)	1,500 (I)	1.3E+10 (I)	7.1E+07 (C, I)	--	--	<70 U	--	--	--	<80 U	--	--	--	<82 U	--	--	--	<64 U	--	--	--	--	--	<59 U	--	<60 U	--
HEXANE	110-54-3	NA	1.8E+05 (C)	1.30E+10	9.2E+07 (C)	5.1E+5 (C)	5.90E+09	3.0E+8 (C)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY RECLAMATION PLANT AREA																			
Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	SB-09 (MDEQ 2013)				SB-10 (MDEQ 2013)				SB-11 (MDEQ 2013)				SS-01 (MDEQ 2013)				SS-02 (MDEQ 2013)							
Field Sample ID									E3PT8 & ME3PT8		SB-9		E3PT9 & ME3PT9		SB-10		E3PW0 & ME3PW0		SB-11		E3PR1 & ME3PR1		SS-1		E3PR2 & ME3PR2		E3PR3 & ME3PR3		SS-2		SS-2D	
Sample Date									09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13	
Sample Interval (bgs)									29 - 41 in		35 - 36 in		48 - 60 in		54 - 55 in		26 - 38 in		32 - 33 in		0 - 10 in		6 - 6 in		0 - 6 in		0 - 6 in		6 - 6 in		6 - 6 in	
Sample Description									Saturated, reddish brown, medium sand		Saturated, reddish brown, medium sand		Moist, reddish brown, medium sand.		Moist, reddish brown, medium sand.		Moist, brown, medium sand with discoloration at 26-38 in		Moist, brown, medium sand with discoloration at 26-38 in		Moist, brown, silty, fine to medium sand with trace silt and some organic matter (roots etc.)		Moist, brown, silty, fine to medium sand with trace silt and some organic matter (roots etc.)		Moist, dark brown, silty, fine to medium sand (stamp sands) with some debris (glass, wood, metal)		Moist, dark brown, silty, fine to medium sand (stamp sands) with some debris (glass, wood, metal)		Moist, dark brown, silty, fine to medium sand (stamp sands) with some debris (glass, wood, metal)		Field Duplicate	
									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 - VOCs (ug/kg) (continued)																																
ISOPROPYLBENZENE	98-82-8	3,200	91,000	5.8E+09	2.5E+07 (C)	260,000	2.6E+09	8E+07 (C)	–	–	<70 U	–	–	–	<80 U	–	–	–	<82 U	–	–	–	<64 U	–	–	–	–	–	<59 U	–	<60 U	–
M,P-XYLENE	1330-20-7	NA	NA	NA	NA	NA	NA	NA	–	–	<140 U	–	–	–	<160 U	–	–	–	<160 U	–	–	–	<130 U	–	–	–	–	–	<120 U	–	<120 U	–
METHYLENE CHLORIDE	75-09-2	30,000 (X)	100	6.60E+09	1.30E+06	100	8.30E+09	5.8E+6 (C)	–	–	<350 U	–	–	–	<400 U	–	–	–	<410 U	–	–	–	<320 U	–	–	–	–	–	<290 U	–	<300 U	–
NAPHTHALENE (VOC)	91-20-3V	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	–	–	<350 U	–	–	–	<400 U	–	–	–	<410 U	–	–	–	<320 U	–	–	–	–	–	<290 U	–	<300 U	–
N-BUTYLBENZENE	104-51-8	ID	1,600	2E+09	2,500,000	4,600	8.8E+08	8,000,000	–	–	<70 U	–	–	–	<80 U	–	–	–	<82 U	–	–	–	<64 U	–	–	–	–	–	<59 U	–	<60 U	–
N-PROPYLBENZENE	103-65-1	ID	1,600 (I)	1.3E+09 (I)	2,500,000 (I)	4,600 (I)	5.9E+08 (I)	8,000,000 (I)	–	–	<70 U	–	–	–	<80 U	–	–	–	<82 U	–	–	–	<64 U	–	–	–	–	–	<59 U	–	<60 U	–
O-XYLENE	95-47-6	NA	NA	NA	NA	NA	NA	NA	–	–	<70 U	–	–	–	<80 U	–	–	–	<82 U	–	–	–	<64 U	–	–	–	–	–	<59 U	–	<60 U	–
P-ISOPROPYL TOLUENE (p-CYMENE)	99-87-6	NA	NA	NA	NA	NA	NA	NA	–	–	<70 U	–	–	–	<80 U	–	–	–	<82 U	–	–	–	<64 U	–	–	–	–	–	<59 U	–	<60 U	–
SEC-BUTYLBENZENE	135-98-8	ID	1,600	4.00E+08	2.50E+06	1,600	1.80E+08	8.00E+06	–	–	<70 U	–	–	–	<80 U	–	–	–	<82 U	–	–	–	<64 U	–	–	–	–	–	<59 U	–	<60 U	–
TOLUENE	108-88-3	5,400 (I)	16,000 (I)	2.7E+10 (I)	5E+07 (C,I)	16,000 (I)	1.2E+10 (I)	1.6E+08 (C,I)	–	–	<70 U	–	–	–	<80 U	–	–	–	<82 U	–	–	–	<64 U	–	–	–	–	–	<59 U	–	<60 U	–
XYLENE - TOTAL	1330-20-7	820 (I)	5,600 (I)	2.9E+11 (I)	4.1E+08 (C,I)	5600 (I)	1.3E+11 (I)	1E+09 (I)	–	–	ND	–	–	–	ND	–	–	–	ND	–	–	–	ND	–	–	–	–	–	ND	–	ND	–
Organics - Pesticides (ug/kg)																																
4,4'-DDD	72-54-8	NLL	NLL	4.40E+07	95,000	NLL	5.60E+07	4.00E+05	<3.5 U	–	–	–	<3.5 U	–	–	–	<3.6 U	–	–	–	<3.6 U	–	–	–	<3.5 UJ	–	<3.5 U	–	–	–	–	–
4,4'-DDE	72-55-9	NLL	NLL	3.20E+07	45,000	NLL	4.00E+07	1.90E+05	<3.5 U	–	–	–	<3.5 U	–	–	–	<3.6 U	–	–	–	<3.6 U	–	–	–	<3.5 UJ	–	<3.5 U	–	–	–	–	–
4,4'-DDT	50-29-3	NLL	NLL	3.20E+07	57,000	NLL	4.00E+07	2.80E+05	<3.5 U	–	–	–	<3.5 U	–	–	–	<3.6 U	–	–	–	<3.6 U	–	–	–	<3.5 UJ	–	<3.5 U	–	–	–	–	–
ALDRIN	309-00-2	NLL	NLL	6.40E+05	1,000	NLL	8.00E+05	4,300	<1.8 U	–	–	–	<1.8 U	–	–	–	<1.9 U	–	–	–	<1.8 U	–	–	–	<1.8 UJ	–	<1.8 U	–	–	–	–	–
ALPHA-BHC	319-84-6	ID	18	1.70E+06	2,600	71	2.10E+06	12,000	<1.8 U	–	–	–	<1.8 U	–	–	–	<1.9 U	–	–	–	<1.8 U	–	–	–	<1.8 UJ	–	<1.8 U	–	–	–	–	–
ALPHA-CHLORODANE	5103-71-9	NA	NA	NA	NA	NA	NA	NA	<1.8 U	–	–	–	<1.8 U	–	–	–	<1.9 U	–	–	–	**20 J**	–	–	–	<1.8 UJ	–	<1.8 U	–	–	–	–	–
BETA-BHC	319-85-7	ID	37	5.90E+06	5,400	150	7.40E+06	25,000	<1.8 U	–	–	–	<1.8 U	–	–	–	<1.9 U	–	–	–	<1.8 U	–	–	–	<1.8 UJ	–	<1.8 U	–	–	–	–	–
DIELDRIN	60-57-1	NLL	NLL	6.80E+05	1,100	NLL	8.50E+05	4,700	<3.5 U	–	–	–	<3.5 U	–	–	–	<3.6 U	–	–	–	<3.6 U	–	–	–	<3.5 UJ	–	<3.5 U	–	–	–	–	–
ENDOSULFAN I	959-98-8	NA	NA	NA	NA	NA	NA	NA	<1.8 U	–	–	–	<1.8 U	–	–	–	<1.9 U	–	–	–	<1.8 U	–	–	–	<1.8 UJ	–	<1.8 U	–	–	–	–	–
ENDOSULFAN II	33213-65-9	NA	NA	NA	NA	NA	NA	NA	<3.5 U	–	–	–	<3.5 U	–	–	–	<3.6 U	–	–	–	<3.6 U	–	–	–	<3.5 UJ	–	<3.5 U	–	–	–	–	–
ENDOSULFAN SULFATE	1031-07-8	NA	NA	NA	NA	NA	NA	NA	<3.5 U	–	–	–	<3.5 U	–	–	–	<3.6 U	–	–	–	<3.6 U	–	–	–	<3.5 UJ	–	<3.5 U	–	–	–	–	–
ENDRIN	72-20-8	NLL	NLL	ID	65,000	NLL	ID	1.90E+05	<3.5 U	–	–	–	<3.5 U	–	–	–	<3.6 U	–	–	–	<3.6 U	–	–	–	<3.5 UJ	–	<3.5 U	–	–	–	–	–
ENDRIN ALDEHYDE	7421-93-4	NA	NA	NA	NA	NA	NA	NA	<3.5 U	–	–	–	<3.5 U	–	–	–	<3.6 U	–	–	–	**4.2**	–	–	–	**4 J**	–	<3.5 U	–	–	–	–	–
ENDRIN KETONE	53494-70-5	NA	NA	NA	NA	NA	NA	NA	<3.5 U	–	–	–	<3.5 U	–	–	–	<3.6 U	–	–	–	<3.6 U	–	–	–	**11 J**	–	<3.5 U	–	–	–	–	–
GAMMA-CHLORDANE	5103-74-2	NA	NA	NA	NA	NA	NA	NA	<1.8 U	–	–	–	<1.8 U	–	–	–	<1.9 U	–	–	–	**10**	–	–	–	<1.8 UJ	–	<1.8 U	–	–	–	–	–
HEPTACHLOR EPOXIDE	102-457-3	NLL	NLL	1.20E+06	3,100	NLL	1.50E+06	9,500	<1.8 U	–	–	–	<1.8 U	–	–	–	<1.9 U	–	–	–	<1.8 U	–	–	–	<1.8 UJ	–	<1.8 U	–	–	–	–	–
METHOXYCHLOR	72-43-5	NA	16,000	ID	1.90E+06	16,000	ID	5.60E+06	<18 U	–	–	–	<18 U	–	–	–	<19 U	–	–	–	<18 U	–	–	–	<18 UJ	–	<18 U	–	–	–	–	–
Asbestos (%)																																
ASBESTOS	ASB	NLL	NLL	1% (1.0E+7 (M); 68,000 ppb)	ID	NLL	1% (1.0E+7 (M); 85,000 ppb)	ID	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

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

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Parameter	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria
Inorganics - Metals (mg/kg)								
ALUMINUM	7429-90-5	NA	6,900 (B)	ID	50,000 (DD)	6,900 (B)	ID	370,000 (DD)
ANTIMONY	7440-36-0	1.2 (X)	4.3	13,000	180	4.3	5,900	670
ARSENIC	7440-38-2	4.6	4.6	720	7.6	4.6	910	37
BARIUM	7440-39-3	130	1,300 (G)	330,000	37,000	1,300	150,000	130,000
BERYLLIUM	7440-41-7	4.6 (G)	51	1,300	410	51	590	1,600
CADMIUM	7440-43-9	1.6 (G,X)	6.0	1,700	550	6.0	2,200	2,100
CALCIUM	7440-70-2	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	7440-47-3	1,200,000 (G,H,X)	1,000,000 (D,H)	330,000 (H)	790,000 (H)	1,000,000 (D,H)	150,000 (H)	1,000,000 (D,H)
COBALT	7440-48-4	2.0	0.8	13,000	2,600	2.0	5,900	9,000
COPPER	7440-50-8	32 (G)	5,800	130,000	20,000	5,800	59,000	73,000
IRON	7439-89-6	NA	12,000 (B)	ID	160,000	12,000 (B)	ID	580,000
LEAD	7439-92-1	1,900 (G,X)	700	100,000	400	700	44,000	900 (DD)
LITHIUM	7439-93-2	9.8 (B)	9.8 (B)	2,300,000	4,200 (DD)	9.8 (B)	1,000,000	31,000 (DD)
MAGNESIUM	7439-95-4	NA	8,000	6,700,000	1,000,000 (D)	22,000	2,900,000	1,000,000 (D)
MANGANESE	7439-96-5	440 (B,G,X)	440 (B)	3,300	25,000	440 (B)	1,500	90,000
MERCURY	7439-97-6	0.13 (B, Z)	1.7 (Z)	20000 (Z)	160 (Z)	1.7 (Z)	8800 (Z)	580 (Z)
NICKEL	7440-02-0	29 (G)	100	13,000	40,000	100	16,000	150,000
POTASSIUM	7440-09-7	NA	NA	NA	NA	NA	NA	NA
SELENIUM	7782-49-2	0.41 (B)	4.0	130,000	2,600	4.0	59,000	9,600
SILVER	7440-22-4	1.0 (M); 0.027	4.5	6,700	2,500	13	2,900	9,000
SODIUM	7440-23-5	NA	NA	NA	NA	NA	NA	NA
THALLIUM	7440-28-0	1.4	2.3	13,000	35	2.3	5,900	130
VANADIUM	7440-62-2	430	72	ID	750 (DD)	990	ID	5,500 (DD)
ZINC	7440-66-6	62 (G)	2,400	ID	170,000	5,000	ID	630,000
Inorganics - Cyanide (mg/kg)								
CYANIDE	57-12-5	0.1 (P,R)	4.0 (P,R)	250 (P,R)	12 (P,R)	4.0 (P,R)	250 (P,R)	250 (P,R)
Organics - PCBs (ug/kg)								
AROCLOR-1260	11096-82-5	NA	NA	NA	NA	NA	NA	NA
AROCLOR-1262	37324-23-5	NA	NA	NA	NA	NA	NA	NA
TOTAL PCBS	TPCB	NLL	NLL	5,200,000 (J)	1,000 (J,T)	NLL	6,500,000 (J)	1,000 (J,T)

Geographic Location	QUINCY RECLAMATION PLANT AREA													
Station Name	SS-03 (MDEQ 2013)						SS-04 (MDEQ 2013)				SS-05 (MDEQ 2013)			
Field Sample ID	E3PR4 & ME3PR4		ME3PR4D		SS-3		E3PR5 & ME3PR5		SS-4		E3PR6 & ME3PR6		SS-5	
Sample Date	09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13	
Sample Interval (bgs)	0 - 2 in		0 - 2 in		2 - 2 in		0 - 8 in		6 - 6 in		0 - 6 in		4 - 4 in	
Sample Description	Moist, brown silt with some fine sand and trace debris (wood, metal, glass)		Field Duplicate		Moist, brown silt with some fine sand and trace debris (wood, metal, glass)		Moist, brown, silty, fine to medium sand and gravel with some debris (glass, wood, metal)		Moist, brown, silty, fine to medium sand and gravel with some debris (glass, wood, metal)		Moist, dark brown, fine sand with some silt and debris (wood, glass, metal) and some metallic scale at the surface		Moist, dark brown, fine sand with some silt and debris (wood, glass, metal) and some metallic scale at the surface	
	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Inorganics - Metals (mg/kg)														
ALUMINUM	16,100	[4,11]	15,900	[4,11]	–	–	10,700	[4,11]	–	–	18,800	[4,11]	–	–
ANTIMONY	3.7 J	[2]	4.3 J	[2]	–	–	1 J	–	–	–	1.4 J	[2]	–	–
ARSENIC	11.6	[2,4,10,11]	11.7	[2,4,10,11]	–	–	3.3	–	–	–	3.4	–	–	–
BARIUM	1,680 J-	[2,4,11]	1,710	[2,4,11]	–	–	52.1 J-	–	–	–	R	–	–	–
BERYLLIUM	0.48	–	0.46 J	–	–	–	0.26 J-	–	–	–	0.34 J	–	–	–
CADMIUM	2.4 J	[2]	2.5	[2]	–	–	0.55 J	–	–	–	0.74 J	–	–	–
CALCIUM	27,000	–	26,600	–	–	–	12,000	–	–	–	26,000	–	–	–
CHROMIUM	54.7 J	–	54.2	–	–	–	18 J	–	–	–	29.1 J	–	–	–
COBALT	18.3 J	[2,4,11]	19.1	[2,4,11]	–	–	12.4 J	[2,4,11]	–	–	21.7 J	[2,4,11]	–	–
COPPER	23,200	[2,4,10,11]	23,300	[2,4,10,11]	–	–	2,810	[2]	–	–	17,100	[2,4,11]	–	–
IRON	80,600	[4,11]	80,900	[4,11]	–	–	28,500	[4,11]	–	–	39,100	[4,11]	–	–
LEAD	1,410	[4,10,11,17]	1,440	[4,10,11,17]	–	–	174	–	–	–	55.8	–	–	–
LITHIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MAGNESIUM	10,400	[4]	10,200	[4]	–	–	6,920	–	–	–	11,300	[4]	–	–
MANGANESE	986	[2,4,11]	956	[2,4,11]	–	–	394	–	–	–	558	[2,4,11]	–	–
MERCURY	2.8	[2,4,11]	2.9	[2,4,11]	–	–	0.51	[2]	–	–	0.39	[2]	–	–
NICKEL	49.6 J	[2]	50.9	[2]	–	–	21.3 J	–	–	–	52 J	[2]	–	–
POTASSIUM	53.8 J-	–	56.5 J	–	–	–	84.2 J-	–	–	–	<393 U	–	–	–
SELENIUM	<3.3 UJ	–	<32 U	–	–	–	<2.8 UJ	–	–	–	<2.8 UJ	–	–	–
SILVER	40.2 J+	[2,4,11]	39.9	[2,4,11]	–	–	4.7 J+	[2,4]	–	–	13.4 J+	[2,4,11]	–	–
SODIUM	359 J	–	351 J	–	–	–	137 J	–	–	–	172 J	–	–	–
THALLIUM	<23.4 UJ	–	<22.8 U	–	–	–	<49.5 UJ	–	–	–	2.2 J	–	–	–
VANADIUM	77.5	[4]	75.8	[4]	–	–	52.7	–	–	–	90.1	[4]	–	–
ZINC	562	[2]	552	[2]	–	–	115	[2]	–	–	84.4	[2]	–	–
Inorganics - Cyanide (mg/kg)														
CYANIDE	0.37 J	[2]	0.37 J	[2]	–	–	<0.55 U	–	–	–	<0.55 U	–	–	–
Organics - PCBs (ug/kg)														
AROCLOR-1260	31 J	–	–	–	–	–	<36 UJ	–	–	–	<36 UJ	–	–	–
AROCLOR-1262	<40 U	–	–	–	–	–	<36 UJ	–	–	–	<36 UJ	–	–	–
TOTAL PCBS	31 J	–	–	–	–	–	ND	–	–	–	ND	–	–	–

Geographic Location	QUINCY RECLAMATION PLANT AREA						QUINCY STAMP SANDS AREA			
Station Name	SS-17 (MDEQ 2013)				SS-18 (MDEQ 2013)		QMCM-SB32			
Field Sample ID	E3PS8 & ME3PS8		SS-17		SS-18		QMCM-SB 32-9"-15"		QMCM-SB 32-15"-5'	
Sample Date	09/10/13		09/10/13		09/11/13		05/20/17		05/20/17	
Sample Interval (bgs)	0 - 8 in		6 - 6 in		1 - 5 in		0.75 - 1.25 ft		1.25 - 5 ft	
Sample Description	Moist, dark brown, silty, fine to medium sand (stamp sand) with some debris (wood, glass, metal)		Moist, dark brown, silty, fine to medium sand (stamp sand) with some debris (wood, glass, metal)		Moist, dark brown, fine to medium sand.		SAND, Fine to medium, gray to 9 ft; saturated at 5 ft		SAND, Fine to medium, gray to 9 ft; saturated at 5 ft	
	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Inorganics - Metals (mg/kg)										
ALUMINUM	18,700	[4,11]	–	–	–	–	–	–	–	–
ANTIMONY	2.3 J	[2]	–	–	–	–	–	–	–	–
ARSENIC	6.2	[2,4,11]	–	–	–	–	–	–	–	–
BARIUM	52.2 J-	–	–	–	–	–	–	–	–	–
BERYLLIUM	0.32 J-	–	–	–	–	–	–	–	–	–
CADMIUM	0.9 J	–	–	–	–	–	–	–	–	–
CALCIUM	24,500	–	–	–	–	–	–	–	–	–
CHROMIUM	28.6 J	–	–	–	–	–	–	–	–	–
COBALT	22.6 J	[2,4,11]	–	–	–	–	–	–	–	–
COPPER	6,510	[2,4,11]	–	–	–	–	–	–	–	–
IRON	57,500	[4,11]	–	–	–	–	–	–	–	–
LEAD	172	–	–	–	–	–	–	–	–	–
LITHIUM	–	–	–	–	–	–	–	–	–	–
MAGNESIUM	12,800	[4]	–	–	–	–	–	–	–	–
MANGANESE	745	[2,4,11]	–	–	–	–	–	–	–	–
MERCURY	2.2	[2,4,11]	–	–	–	–	–	–	–	–
NICKEL	38.1 J	[2]	–	–	–	–	–	–	–	–
POTASSIUM	<502 U	–	–	–	–	–	–	–	–	–
SELENIUM	<3.5 UJ	–	–	–	–	–	–	–	–	–
SILVER	17.6 J+	[2,4,11]	–	–	–	–	–	–	–	–
SODIUM	219 J	–	–	–	–	–	–	–	–	–
THALLIUM	<25.1 UJ	–	–	–	–	–	–	–	–	–
VANADIUM	88.1	[4]	–	–	–	–	–	–	–	–
ZINC	153	[2]	–	–	–	–	–	–	–	–
Inorganics - Cyanide (mg/kg)										
CYANIDE	<0.59 U	–	–	–	–	–	–	–	–	–
Organics - PCBs (ug/kg)										
AROCLOR-1260	<39 U	–	–	–	6,900	–	–	–	–	–
AROCLOR-1262	<39 U	–	–	–	<6900 U	–	–	–	–	–
TOTAL PCBS	ND	–	–	–	6,900	[10,17]	–	–	–	–

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY RECLAMATION PLANT AREA																				QUINCY STAMP SANDS AREA			
Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	SS-03 (MDEQ 2013)						SS-04 (MDEQ 2013)				SS-05 (MDEQ 2013)				SS-17 (MDEQ 2013)				SS-18 (MDEQ 2013)		QMCM-SB32			
Field Sample ID									E3PR4 & ME3PR4		ME3PR4D		SS-3		E3PR5 & ME3PR5		SS-4		E3PR6 & ME3PR6		SS-5		E3PS8 & ME3PS8		SS-17		SS-18		QMCM-SB 32-9"-15"		QMCM-SB 32-15"-5'	
Sample Date									09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/11/13		05/20/17		05/20/17	
Sample Interval (bgs)									0 - 2 in		0 - 2 in		2 - 2 in		0 - 8 in		6 - 6 in		0 - 6 in		4 - 4 in		0 - 8 in		6 - 6 in		1 - 5 in		0.75 - 1.25 ft		1.25 - 5 ft	
Sample Description									Moist, brown silt with some fine sand and trace debris (wood, metal, glass)		Field Duplicate		Moist, brown silt with some fine sand and trace debris (wood, metal, glass)		Moist, brown, silty, fine to medium sand and gravel with some debris (glass, wood, metal)		Moist, brown, silty, fine to medium sand and gravel with some debris (glass, wood, metal)		Moist, dark brown, fine sand with some silt and debris (wood, glass, metal) and some metallic scale at the surface		Moist, dark brown, fine sand with some silt and debris (wood, glass, metal) and some metallic scale at the surface		Moist, dark brown, silty, fine to medium sand (stamp sand) with some debris (wood, glass, metal)		Moist, dark brown, silty, fine to medium sand (stamp sand) with some debris (wood, glass, metal)		Moist, dark brown, fine to medium sand.		SAND, Fine to medium, gray to 9 ft; saturated at 5 ft		SAND, Fine to medium, gray to 9 ft; saturated at 5 ft	
									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)																																
1,1'-BIPHENYL	92-52-4	NA	NA	NA	NA	NA	NA	NA	<2100 U	–	–	–	–	–	<180 U	–	–	–	<180 U	–	–	–	<200 U	–	–	–	–	–	–	–	–	–
2-METHYLNAPHTHALENE (SVOC)	91-57-6S	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07	<2100 U	–	–	–	–	–	<180 U	–	–	–	<180 U	–	–	–	<200 U	–	–	–	<3300 UJ	–	–	–	–	–
ACENAPHTHENE	83-32-9	8,700	300,000	1.4E+10	4.1E+07	880,000	6.2E+09	1.3E+08	<2100 U	–	–	–	–	–	**50 J**	–	–	–	<180 U	–	–	–	<200 U	–	–	–	<1300 UJ	–	–	–	–	–
ACENAPHTHYLENE	208-96-8	ID	5,900	2.3E+09	1,600,000	17,000	1E+09	5,200,000	<2100 U	–	–	–	–	–	**140 J**	–	–	–	<180 U	–	–	–	<200 U	–	–	–	<1300 UJ	–	–	–	–	–
ACETOPHENONE	98-86-2	ID	30,000	3.3E+10	4.7E+07 (C)	88,000	1.4E+10	1.5E+08 (C)	**1,300 J**	–	–	–	–	–	**90 J**	–	–	–	**65 J**	–	–	–	**63 J**	–	–	–	–	–	–	–	–	–
ANTHRACENE	120-12-7	ID	41,000	6.7E+10	2.3E+08	41,000	2.9E+10	7.3E+08	<2100 U	–	–	–	–	–	**300**	–	–	–	<180 U	–	–	–	<200 U	–	–	–	<1300 UJ	–	–	–	–	–
BENZO(A)ANTHRACENE	56-55-3	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)	**850 J**	–	–	–	–	–	**950**	–	–	–	<180 U	–	–	–	**48 J**	–	–	–	<1300 UJ	–	–	–	–	–
BENZO(A)PYRENE	50-32-8	NLL	NLL	1,500,000 (Q)	2,000 (Q)	NLL	1,900,000 (Q)	8,000 (Q)	**640 J**	–	–	–	–	–	**750**	–	–	–	<180 U	–	–	–	**53 J**	–	–	–	<2600 UJ	–	–	–	–	–
BENZO(B)FLUORANTHENE	205-99-2	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)	**1,400 J**	–	–	–	–	–	**1,200**	–	–	–	<180 U	–	–	–	**95 J**	–	–	–	<2600 UJ	–	–	–	–	–
BENZO(G,H,I)PERYLENE	191-24-2	NLL	NLL	8E+08 (Q)	2,500,000 (Q)	NLL	3.5E+08 (Q)	7,000,000 (Q)	**630 J**	–	–	–	–	–	**560**	–	–	–	<180 U	–	–	–	**78 J**	–	–	–	<2600 UJ	–	–	–	–	–
BENZO(K)FLUORANTHENE	207-08-9	NLL	NLL	ID	200,000 (Q)	NLL	ID	800,000 (Q)	**730 J**	–	–	–	–	–	**600**	–	–	–	<180 U	–	–	–	**50 J**	–	–	–	<2600 UJ	–	–	–	–	–
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	NLL	NLL	7E+08	2,800,000	NLL	8.9E+08	1.2E+07 (C)	<2100 U	–	–	–	–	–	<180 U	–	–	–	**68 J**	–	–	–	<200 U	–	–	–	<3300 UJ	–	–	–	–	–
CARBAZOLE	86-74-8	1,100	9,400	6.2E+07	530,000	39,000	7.8E+07	2,400,000	<2100 U	–	–	–	–	–	**98 J**	–	–	–	<180 U	–	–	–	<200 U	–	–	–	<3300 UJ	–	–	–	–	–
CHRYSENE	218-01-9	NLL	NLL	ID	2,000,000 (Q)	NLL	ID	8,000,000 (Q)	**1,400 J**	–	–	–	–	–	**1,000**	–	–	–	<180 U	–	–	–	**70 J**	–	–	–	<1300 UJ	–	–	–	–	–
DIBENZO(A,H)ANTHRACENE	53-70-3	NLL	NLL	ID	2,000 (Q)	NLL	ID	8,000 (Q)	<2100 U	–	–	–	–	–	**180 J**	–	–	–	<180 U	–	–	–	<200 U	–	–	–	<2600 UJ	–	–	–	–	–
DIBENZOFURAN	132-64-9	1,700	ID	6,700,000	ID	ID	2,900,000	ID	<2100 U	–	–	–	–	–	**46 J**	–	–	–	<180 U	–	–	–	<200 U	–	–	–	<3300 UJ	–	–	–	–	–
DI-N-BUTYLPHTHALATE	84-74-2	11000	960,000	3.30E+09	2.70E+07	2.7E+6 (C)	1.50E+09	8.7E+7 (C)	<2100 U	–	–	–	–	–	**36 J**	–	–	–	**39 J**	–	–	–	**130 J**	–	–	–	<3300 UJ	–	–	–	–	–
FLUORANTHENE	206-44-0	5,500	730,000	9.3E+09	4.6E+07	730,000	4.1E+09	1.3E+08	**1,100 J**	–	–	–	–	–	**2,500**	–	–	–	<180 U	–	–	–	**110 J**	–	–	–	<1300 UJ	–	–	–	–	–
FLUORENE	86-73-7	5,300	390,000	9.3E+09	2.7E+07	890,000	4.1E+09	8.7E+07	<2100 U	–	–	–	–	–	**85 J**	–	–	–	<180 U	–	–	–	<200 U	–	–	–	<1300 UJ	–	–	–	–	–
INDENO(1,2,3-CD)PYRENE	193-39-5	NLL	NLL	ID	20,000	NLL	ID	80,000	**660 J**	–	–	–	–	–	**540**	–	–	–	<180 U	–	–	–	**60 J**	–	–	–	<2600 UJ	–	–	–	–	–
NAPHTHALENE (SVOC)	91-20-3S	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	<2100 U	–	–	–	–	–	<180 U	–	–	–	<180 U	–	–	–	<200 U	–	–	–	<1300 UJ	–	–	–	–	–
PHENANTHRENE	85-01-8	2,100	56,000	6,700,000	1,600,000	160,000	2,900,000	5,200,000	<2100 U	–	–	–	–	–	**1,400**	–	–	–	<180 U	–	–	–	**58 J**	–	–	–	<1300 UJ	–	–	–	–	–
PYRENE	129-00-0	ID	480,000	6.7E+09	2.9E+07	480,000	2.9E+09	8.4E+07	**940 J**	–	–	–	–	–	**1,900**	–	–	–	<180 U	–	–	–	**77 J**	–	–	–	<1300 UJ	–	–	–	–	–
Organics - VOCs (ug/kg)																																
1,2,3-TRIMETHYLBENZENE	526-73-8	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	<68 U	–	–	–	<65 U	–	–	–	<57 U	–	–	–	<69 U	–	–	–	<66 U	–	<64 U	–
1,2,4-TRIMETHYLBENZENE	95-63-6	570 (I)	2,100 (I)	8.2E+10 (I)	3.2E+07 (C,I)	2,100 (I)	3.6E+10 (I)	1E+08 (C,I)	–	–	–	–	<68 U	–	–	–	<65 U	–	–	–	<57 U	–	–	–	<69 U	–	–	–	<66 U	–	<64 U	–
1,3,5-TRIMETHYLBENZENE	108-67-8	1,100 (I)	1,800 (I)	8.2E+10 (I)	3.2E+07 (C,I)	1,800 (I)	3.6E+10 (I)	1E+08 (C,I)	–	–	–	–	<68 U	–	–	–	<65 U	–	–	–	<57 U	–	–	–	<69 U	–	–	–	<66 U	–	<64 U	–
2-METHYLNAPHTHALENE (VOC)	91-57-6V	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07	–	–	–	–	<340 UJ	–	–	–	<320 U	–	–	–	<290 U	–	–	–	<340 UJ	–	–	–	<330 U	–	<320 U	–
BENZENE	71-43-2	240 (I,X)	100 (I)	3.8E+08 (I)	180,000 (I)	100 (I)	4.7E+08 (I)	840,000 (C,I)	–	–	–	–	<68 U	–	–	–	<65 U	–	–	–	<57 U	–	–	–	<69 U	–	–	–	<66 U	–	<64 U	–
CYCLOHEXANE	110-82-7	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	<340 U	–	–	–	<320 U	–	–	–	<290 U	–	–	–	<340 U	–	–	–	<330 U	–	<320 U	–
ETHYLBENZENE	100-41-4	360 (I)	1,500 (I)	1E+10 (I)	2.2E+07 (C,I)	1,500 (I)	1.3E+10 (I)	7.1E+07 (C, I)	–	–	–	–	<68 U	–	–	–	<65 U	–	–	–	<57 U	–	–	–	<69 U	–	–	–	<66 U	–	<64 U	–
HEXANE	110-54-3	NA	1.8E+05 (C)	1.30E+10	9.2E+07 (C)	5.1E+5 (C)	5.90E+09	3.0E+8 (C)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	<66 U	–	<64 U	–

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY RECLAMATION PLANT AREA																					QUINCY STAMP SANDS AREA			
Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	SS-03 (MDEQ 2013)						SS-04 (MDEQ 2013)				SS-05 (MDEQ 2013)				SS-17 (MDEQ 2013)				SS-18 (MDEQ 2013)		QMCM-SB32			
Field Sample ID									E3PR4 & ME3PR4		ME3PR4D		SS-3		E3PR5 & ME3PR5		SS-4		E3PR6 & ME3PR6		SS-5		E3PS8 & ME3PS8		SS-17		SS-18		QMCM-SB 32-9"-15"		QMCM-SB 32-15"-5'	
Sample Date									09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/11/13		05/20/17		05/20/17	
Sample Interval (bgs)									0 - 2 in		0 - 2 in		2 - 2 in		0 - 8 in		6 - 6 in		0 - 6 in		4 - 4 in		0 - 8 in		6 - 6 in		1 - 5 in		0.75 - 1.25 ft		1.25 - 5 ft	
Sample Description									Moist, brown silt with some fine sand and trace debris (wood, metal, glass)		Field Duplicate		Moist, brown silt with some fine sand and trace debris (wood, metal, glass)		Moist, brown, silty, fine to medium sand and gravel with some debris (glass, wood, metal)		Moist, brown, silty, fine to medium sand and gravel with some debris (glass, wood, metal)		Moist, dark brown, fine sand with some silt and debris (wood, glass, metal) and some metallic scale at the surface		Moist, dark brown, fine sand with some silt and debris (wood, glass, metal) and some metallic scale at the surface		Moist, dark brown, silty, fine to medium sand (stamp sand) with some debris (wood, glass, metal)		Moist, dark brown, silty, fine to medium sand (stamp sand) with some debris (wood, glass, metal)		Moist, dark brown, fine to medium sand.		SAND, Fine to medium, gray to 9 ft; saturated at 5 ft		SAND, Fine to medium, gray to 9 ft; saturated at 5 ft	
									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 - VOCs (ug/kg) (continued)																																
ISOPROPYLBENZENE	98-82-8	3,200	91,000	5.8E+09	2.5E+07 (C)	260,000	2.6E+09	8E+07 (C)	–	–	–	–	<68 U	–	–	–	<65 U	–	–	–	<57 U	–	–	–	<69 U	–	–	–	<66 U	–	<64 U	–
M,P-XYLENE	1330-20-7	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	<140 U	–	–	–	<130 U	–	–	–	<110 U	–	–	–	<140 U	–	–	–	<130 U	–	<130 U	–
METHYLENE CHLORIDE	75-09-2	30,000 (X)	100	6.60E+09	1.30E+06	100	8.30E+09	5.8E+6 (C)	–	–	–	–	<340 U	–	–	–	<320 U	–	–	–	<290 U	–	–	–	<340 U	–	–	–	<130 U	–	<130 U	–
NAPHTHALENE (VOC)	91-20-3V	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	–	–	–	–	<340 U	–	–	–	<320 U	–	–	–	<290 U	–	–	–	<340 U	–	–	–	<330 U	–	<320 U	–
N-BUTYLBENZENE	104-51-8	ID	1,600	2E+09	2,500,000	4,600	8.8E+08	8,000,000	–	–	–	–	<68 U	–	–	–	<65 U	–	–	–	<57 U	–	–	–	<69 U	–	–	–	<66 U	–	<64 U	–
N-PROPYLBENZENE	103-65-1	ID	1,600 (I)	1.3E+09 (I)	2,500,000 (I)	4,600 (I)	5.9E+08 (I)	8,000,000 (I)	–	–	–	–	<68 U	–	–	–	<65 U	–	–	–	<57 U	–	–	–	<69 U	–	–	–	<66 U	–	<64 U	–
O-XYLENE	95-47-6	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	<68 U	–	–	–	<65 U	–	–	–	<57 U	–	–	–	<69 U	–	–	–	<66 U	–	<64 U	–
P-ISOPROPYL TOLUENE (p-CYMENE)	99-87-6	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	<68 U	–	–	–	<65 U	–	–	–	<57 U	–	–	–	<69 U	–	–	–	–	–	–	–
SEC-BUTYLBENZENE	135-98-8	ID	1,600	4.00E+08	2.50E+06	1,600	1.80E+08	8.00E+06	–	–	–	–	<68 U	–	–	–	<65 U	–	–	–	<57 U	–	–	–	<69 U	–	–	–	<66 U	–	<64 U	–
TOLUENE	108-88-3	5,400 (I)	16,000 (I)	2.7E+10 (I)	5E+07 (C,I)	16,000 (I)	1.2E+10 (I)	1.6E+08 (C,I)	–	–	–	–	<68 U	–	–	–	<65 U	–	–	–	<57 U	–	–	–	<69 U	–	–	–	<66 U	–	<64 U	–
XYLENE - TOTAL	1330-20-7	820 (I)	5,600 (I)	2.9E+11 (I)	4.1E+08 (C,I)	5600 (I)	1.3E+11 (I)	1E+09 (I)	–	–	–	–	ND	–	–	–	ND	–	–	–	ND	–	–	–	ND	–	–	–	ND	–	ND	–
Organics - Pesticides (ug/kg)																																
4,4'-DDD	72-54-8	NLL	NLL	4.40E+07	95,000	NLL	5.60E+07	4.00E+05	<4 U	–	–	–	–	–	<3.5 U	–	–	–	<3.5 U	–	–	–	<4 U	–	–	–	–	–	–	–	–	–
4,4'-DDE	72-55-9	NLL	NLL	3.20E+07	45,000	NLL	4.00E+07	1.90E+05	<4 U	–	–	–	–	–	<3.5 U	–	–	–	<3.5 U	–	–	–	<4 U	–	–	–	–	–	–	–	–	–
4,4'-DDT	50-29-3	NLL	NLL	3.20E+07	57,000	NLL	4.00E+07	2.80E+05	<4 U	–	–	–	–	–	<3.5 U	–	–	–	<3.5 U	–	–	–	<4 U	–	–	–	–	–	–	–	–	–
ALDRIN	309-00-2	NLL	NLL	6.40E+05	1,000	NLL	8.00E+05	4,300	<2.1 U	–	–	–	–	–	<1.8 U	–	–	–	<1.8 U	–	–	–	<2 U	–	–	–	–	–	–	–	–	–
ALPHA-BHC	319-84-6	ID	18	1.70E+06	2,600	71	2.10E+06	12,000	<2.1 U	–	–	–	–	–	<1.8 U	–	–	–	<1.8 U	–	–	–	<2 U	–	–	–	–	–	–	–	–	–
ALPHA-CHLORODANE	5103-71-9	NA	NA	NA	NA	NA	NA	NA	<2.1 U	–	–	–	–	–	<1.8 U	–	–	–	<1.8 U	–	–	–	<2 U	–	–	–	–	–	–	–	–	–
BETA-BHC	319-85-7	ID	37	5.90E+06	5,400	150	7.40E+06	25,000	<2.1 U	–	–	–	–	–	<1.8 U	–	–	–	<1.8 U	–	–	–	<2 U	–	–	–	–	–	–	–	–	–
DIELDRIN	60-57-1	NLL	NLL	6.80E+05	1,100	NLL	8.50E+05	4,700	<4 U	–	–	–	–	–	<3.5 U	–	–	–	<3.5 U	–	–	–	<4 U	–	–	–	–	–	–	–	–	–
ENDOSULFAN I	959-98-8	NA	NA	NA	NA	NA	NA	NA	<2.1 U	–	–	–	–	–	<1.8 U	–	–	–	<1.8 U	–	–	–	<2 U	–	–	–	–	–	–	–	–	–
ENDOSULFAN II	33213-65-9	NA	NA	NA	NA	NA	NA	NA	<4 U	–	–	–	–	–	<3.5 U	–	–	–	<3.5 U	–	–	–	<4 U	–	–	–	–	–	–	–	–	–
ENDOSULFAN SULFATE	1031-07-8	NA	NA	NA	NA	NA	NA	NA	**5.5 J**	–	–	–	–	–	**5.2 J**	–	–	–	<3.5 U	–	–	–	<4 U	–	–	–	–	–	–	–	–	–
ENDRIN	72-20-8	NLL	NLL	ID	65,000	NLL	ID	1.90E+05	<4 U	–	–	–	–	–	<3.5 U	–	–	–	<3.5 U	–	–	–	<4 U	–	–	–	–	–	–	–	–	–
ENDRIN ALDEHYDE	7421-93-4	NA	NA	NA	NA	NA	NA	NA	<4 U	–	–	–	–	–	<3.5 U	–	–	–	<3.5 U	–	–	–	<4 U	–	–	–	–	–	–	–	–	–
ENDRIN KETONE	53494-70-5	NA	NA	NA	NA	NA	NA	NA	**10**	–	–	–	–	–	**4.5 J**	–	–	–	<3.5 U	–	–	–	<4 U	–	–	–	–	–	–	–	–	–
GAMMA-CHLORDANE	5103-74-2	NA	NA	NA	NA	NA	NA	NA	<2.1 U	–	–	–	–	–	<1.8 U	–	–	–	<1.8 U	–	–	–	<2 U	–	–	–	–	–	–	–	–	–
HEPTACHLOR EPOXIDE	102-457-3	NLL	NLL	1.20E+06	3,100	NLL	1.50E+06	9,500	<2.1 U	–	–	–	–	–	<1.8 U	–	–	–	<1.8 U	–	–	–	<2 U	–	–	–	–	–	–	–	–	–
METHOXYCHLOR	72-43-5	NA	16,000	ID	1.90E+06	16,000	ID	5.60E+06	<21 U	–	–	–	–	–	<18 U	–	–	–	<18 U	–	–	–	<20 U	–	–	–	–	–	–	–	–	–
Asbestos (%)																																
ASBESTOS	ASB	NLL	NLL	1% (1.0E+7 (M); 68,000 ppb)	ID	NLL	1% (1.0E+7 (M); 85,000 ppb)	ID	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

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

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria
Inorganics - Metals (mg/kg)								
ALUMINUM	7429-90-5	NA	6,900 (B)	ID	50,000 (DD)	6,900 (B)	ID	370,000 (DD)
ANTIMONY	7440-36-0	1.2 (X)	4.3	13,000	180	4.3	5,900	670
ARSENIC	7440-38-2	4.6	4.6	720	7.6	4.6	910	37
BARIUM	7440-39-3	130	1,300 (G)	330,000	37,000	1,300	150,000	130,000
BERYLLIUM	7440-41-7	4.6 (G)	51	1,300	410	51	590	1,600
CADMIUM	7440-43-9	1.6 (G,X)	6.0	1,700	550	6.0	2,200	2,100
CALCIUM	7440-70-2	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	7440-47-3	1,200,000 (G,H,X)	1,000,000 (D,H)	330,000 (H)	790,000 (H)	1,000,000 (D,H)	150,000 (H)	1,000,000 (D,H)
COBALT	7440-48-4	2.0	0.8	13,000	2,600	2.0	5,900	9,000
COPPER	7440-50-8	32 (G)	5,800	130,000	20,000	5,800	59,000	73,000
IRON	7439-89-6	NA	12,000 (B)	ID	160,000	12,000 (B)	ID	580,000
LEAD	7439-92-1	1,900 (G,X)	700	100,000	400	700	44,000	900 (DD)
LITHIUM	7439-93-2	9.8 (B)	9.8 (B)	2,300,000	4,200 (DD)	9.8 (B)	1,000,000	31,000 (DD)
MAGNESIUM	7439-95-4	NA	8,000	6,700,000	1,000,000 (D)	22,000	2,900,000	1,000,000 (D)
MANGANESE	7439-96-5	440 (B,G,X)	440 (B)	3,300	25,000	440 (B)	1,500	90,000
MERCURY	7439-97-6	0.13 (B, Z)	1.7 (Z)	20000 (Z)	160 (Z)	1.7 (Z)	8800 (Z)	580 (Z)
NICKEL	7440-02-0	29 (G)	100	13,000	40,000	100	16,000	150,000
POTASSIUM	7440-09-7	NA	NA	NA	NA	NA	NA	NA
SELENIUM	7782-49-2	0.41 (B)	4.0	130,000	2,600	4.0	59,000	9,600
SILVER	7440-22-4	1.0 (M); 0.027	4.5	6,700	2,500	13	2,900	9,000
SODIUM	7440-23-5	NA	NA	NA	NA	NA	NA	NA
THALLIUM	7440-28-0	1.4	2.3	13,000	35	2.3	5,900	130
VANADIUM	7440-62-2	430	72	ID	750 (DD)	990	ID	5,500 (DD)
ZINC	7440-66-6	62 (G)	2,400	ID	170,000	5,000	ID	630,000
Inorganics - Cyanide (mg/kg)								
CYANIDE	57-12-5	0.1 (P,R)	4.0 (P,R)	250 (P,R)	12 (P,R)	4.0 (P,R)	250 (P,R)	250 (P,R)
Organics - PCBs (ug/kg)								
AROCLOR-1260	11096-82-5	NA	NA	NA	NA	NA	NA	NA
AROCLOR-1262	37324-23-5	NA	NA	NA	NA	NA	NA	NA
TOTAL PCBS	TPCB	NLL	NLL	5,200,000 (J)	1,000 (J,T)	NLL	6,500,000 (J)	1,000 (J,T)

QUINCY STAMP SANDS AREA																				
Station Name	QMCM-SB33						QMCM-SB34				QMCM-SB35				QMCM-SB36				SB/TMW-01 (UPEA 2016)	
Field Sample ID	QMCM-SB 33-6"-12"		QMCM-SB 33-1'-4'		QMCM-SB 33-1'-4' dup		QMCM-SB 34-12"-18"		QMCM-SB 34-18"-24"		QMCM-SB 35-12"-18"		QMCM-SB 35-18"-5'		QMCM-SB 36-6"-12"		QMCM-SB 36-12"-2'		SB-01-2	
Sample Date	05/20/17		05/20/17		05/20/17		05/20/17		05/20/17		05/20/17		05/20/17		05/20/17		05/20/17		11/30/16	
Sample Interval (bgs)	0.5 - 1 ft		1 - 4 ft		1 - 4 ft		1 - 1.5 ft		1.5 - 2 ft		1 - 1.5 ft		1.5 - 5 ft		0.5 - 1 ft		1 - 2 ft		2 - 2 ft	
Sample Description	SAND, Fine to medium, gray to 5 ft; saturated at 4 ft		SAND, Fine to medium, gray to 5 ft; saturated at 4 ft		Field Duplicate		SAND, Fine to medium, gray to 5 ft; saturated at 2 ft		SAND, Fine to medium, gray to 5 ft; saturated at 2 ft		SAND, Fine to medium, gray to 5 ft; saturated at 5 ft		SAND, Fine to medium, gray to 5 ft; saturated at 5 ft		SAND, Fine to medium, reddish brown to 2 ft		SAND, Fine to medium, reddish brown to 2 ft		Stamp Sand	
	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	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ANTIMONY	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ARSENIC	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	**0.67**	–
BARIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	**8**	–
BERYLLIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CADMIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	<0.33 U	–
CALCIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CHROMIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	**26**	–
COBALT	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
COPPER	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	**880**	[2]
IRON	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
LEAD	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	**4.2**	–
LITHIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MAGNESIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MANGANESE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MERCURY	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	**0.077**	–
NICKEL	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	**36**	[2]
POTASSIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SELENIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	**1**	[2]
SILVER	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	**0.91**	–
SODIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
THALLIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
VANADIUM	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ZINC	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	**67**	[2]
Inorganics - Cyanide (mg/kg)																				
CYANIDE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Organics - PCBs (ug/kg)																				
AROCLOR-1260	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	<91 U	–
AROCLOR-1262	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TOTAL PCBS	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY STAMP SANDS AREA																			
Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	QMCM-SB33						QMCM-SB34				QMCM-SB35				QMCM-SB36				SB/TMW-01 (UPEA 2016)	
Field Sample ID									QMCM-SB 33-6"-12"		QMCM-SB 33-1'-4'		QMCM-SB 33-1'-4' dup		QMCM-SB 34-12"-18"		QMCM-SB 34-18"-24"		QMCM-SB 35-12"-18"		QMCM-SB 35-18"-5'		QMCM-SB 36-6"-12"		QMCM-SB 36-12"-2'		SB-01-2	
Sample Date									05/20/17		05/20/17		05/20/17		05/20/17		05/20/17		05/20/17		05/20/17		05/20/17		05/20/17		11/30/16	
Sample Interval (bgs)									0.5 - 1 ft		1 - 4 ft		1 - 4 ft		1 - 1.5 ft		1.5 - 2 ft		1 - 1.5 ft		1.5 - 5 ft		0.5 - 1 ft		1 - 2 ft		2 - 2 ft	
Sample Description									SAND, Fine to medium, gray to 5 ft; saturated at 4 ft		SAND, Fine to medium, gray to 5 ft; saturated at 4 ft		Field Duplicate		SAND, Fine to medium, gray to 5 ft; saturated at 2 ft		SAND, Fine to medium, gray to 5 ft; saturated at 2 ft		SAND, Fine to medium, gray to 5 ft; saturated at 5 ft		SAND, Fine to medium, gray to 5 ft; saturated at 5 ft		SAND, Fine to medium, reddish brown to 2 ft		SAND, Fine to medium, reddish brown to 2 ft		Stamp Sand	
									Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Organics - SVOCs (ug/kg)																												
1,1'-BIPHENYL	92-52-4	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2-METHYLNAPHTHALENE (SVOC)	91-57-6S	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	<87 U	–
ACENAPHTHENE	83-32-9	8,700	300,000	1.4E+10	4.1E+07	880,000	6.2E+09	1.3E+08	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	<33 U	–
ACENAPHTHYLENE	208-96-8	ID	5,900	2.3E+09	1,600,000	17,000	1E+09	5,200,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	<33 U	–
ACETOPHENONE	98-86-2	ID	30,000	3.3E+10	4.7E+07 (C)	88,000	1.4E+10	1.5E+08 (C)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ANTHRACENE	120-12-7	ID	41,000	6.7E+10	2.3E+08	41,000	2.9E+10	7.3E+08	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	<33 U	–
BENZO(A)ANTHRACENE	56-55-3	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	<33 U	–
BENZO(A)PYRENE	50-32-8	NLL	NLL	1,500,000 (Q)	2,000 (Q)	NLL	1,900,000 (Q)	8,000 (Q)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	<33 U	–
BENZO(B)FLUORANTHENE	205-99-2	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	<33 U	–
BENZO(G,H,I)PERYLENE	191-24-2	NLL	NLL	8E+08 (Q)	2,500,000 (Q)	NLL	3.5E+08 (Q)	7,000,000 (Q)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	<33 U	–
BENZO(K)FLUORANTHENE	207-08-9	NLL	NLL	ID	200,000 (Q)	NLL	ID	800,000 (Q)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	<33 U	–
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	NLL	NLL	7E+08	2,800,000	NLL	8.9E+08	1.2E+07 (C)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CARBAZOLE	86-74-8	1,100	9,400	6.2E+07	530,000	39,000	7.8E+07	2,400,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CHRYSENE	218-01-9	NLL	NLL	ID	2,000,000 (Q)	NLL	ID	8,000,000 (Q)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	<33 U	–
DIBENZO(A,H)ANTHRACENE	53-70-3	NLL	NLL	ID	2,000 (Q)	NLL	ID	8,000 (Q)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	<33 U	–
DIBENZOFURAN	132-64-9	1,700	ID	6,700,000	ID	ID	2,900,000	ID	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DI-N-BUTYLPHTHALATE	84-74-2	11000	960,000	3.30E+09	2.70E+07	2.7E+6 (C)	1.50E+09	8.7E+7 (C)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
FLUORANTHENE	206-44-0	5,500	730,000	9.3E+09	4.6E+07	730,000	4.1E+09	1.3E+08	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	<33 U	–
FLUORENE	86-73-7	5,300	390,000	9.3E+09	2.7E+07	890,000	4.1E+09	8.7E+07	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	<33 U	–
INDENO(1,2,3-CD)PYRENE	193-39-5	NLL	NLL	ID	20,000	NLL	ID	80,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	<33 U	–
NAPHTHALENE (SVOC)	91-20-3S	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	<33 U	–
PHENANTHRENE	85-01-8	2,100	56,000	6,700,000	1,600,000	160,000	2,900,000	5,200,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	<33 U	–
PYRENE	129-00-0	ID	480,000	6.7E+09	2.9E+07	480,000	2.9E+09	8.4E+07	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	<33 U	–
Organics - VOCs (ug/kg)																												
1,2,3-TRIMETHYLBENZENE	526-73-8	NA	NA	NA	NA	NA	NA	NA	<63 U	–	<70 U	–	<69 U	–	<60 U	–	<69 U	–	<60 U	–	<58 U	–	<70 U	–	<71 U	–	–	–
1,2,4-TRIMETHYLBENZENE	95-63-6	570 (I)	2,100 (I)	8.2E+10 (I)	3.2E+07 (C,I)	2,100 (I)	3.6E+10 (I)	1E+08 (C,I)	<63 U	–	<70 U	–	<69 U	–	<60 U	–	<69 U	–	<60 U	–	<58 U	–	<70 U	–	<71 U	–	<40 U	–
1,3,5-TRIMETHYLBENZENE	108-67-8	1,100 (I)	1,800 (I)	8.2E+10 (I)	3.2E+07 (C,I)	1,800 (I)	3.6E+10 (I)	1E+08 (C,I)	<63 U	–	<70 U	–	<69 U	–	<60 U	–	<69 U	–	<60 U	–	<58 U	–	<70 U	–	<71 U	–	<40 U	–
2-METHYLNAPHTHALENE (VOC)	91-57-6V	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07	<320 U	–	<350 U	–	<350 U	–	<300 U	–	<350 U	–	<300 U	–	<290 U	–	<350 U	–	<360 U	–	<130 U	–
BENZENE	71-43-2	240 (I,X)	100 (I)	3.8E+08 (I)	180,000 (I)	100 (I)	4.7E+08 (I)	840,000 (C,I)	<63 U	–	<70 U	–	<69 U	–	<60 U	–	<69 U	–	<60 U	–	<58 U	–	<70 U	–	<71 U	–	<40 U	–
CYCLOHEXANE	110-82-7	NA	NA	NA	NA	NA	NA	NA	<320 U	–	<350 U	–	<350 U	–	<300 U	–	<350 U	–	<300 U	–	<290 U	–	<350 U	–	<360 U	–	–	–
ETHYLBENZENE	100-41-4	360 (I)	1,500 (I)	1E+10 (I)	2.2E+07 (C,I)	1,500 (I)	1.3E+10 (I)	7.1E+07 (C, I)	<63 U	–	<70 U	–	<69 U	–	<60 U	–	<69 U	–	<60 U	–	<58 U	–	<70 U	–	<71 U	–	<40 U	–
HEXANE	110-54-3	NA	1.8E+05 (C)	1.30E+10	9.2E+07 (C)	5.1E+5 (C)	5.90E+09	3.0E+8 (C)	<63 U	–	<70 U	–	<69 U	–	<60 U	–	<69 U	–	<60 U	–	<58 U	–	<70 U	–	<71 U	–	–	–

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location								
Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria
Field Sample ID								
Sample Date								
Sample Interval (bgs)								
Sample Description								
Organics - VOCs (ug/kg) (continued)								
ISOPROPYLBENZENE	98-82-8	3,200	91,000	5.8E+09	2.5E+07 (C)	260,000	2.6E+09	8E+07 (C)
M,P-XYLENE	1330-20-7	NA	NA	NA	NA	NA	NA	NA
METHYLENE CHLORIDE	75-09-2	30,000 (X)	100	6.60E+09	1.30E+06	100	8.30E+09	5.8E+6 (C)
NAPHTHALENE (VOC)	91-20-3V	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07
N-BUTYLBENZENE	104-51-8	ID	1,600	2E+09	2,500,000	4,600	8.8E+08	8,000,000
N-PROPYLBENZENE	103-65-1	ID	1,600 (I)	1.3E+09 (I)	2,500,000 (I)	4,600 (I)	5.9E+08 (I)	8,000,000 (I)
O-XYLENE	95-47-6	NA	NA	NA	NA	NA	NA	NA
P-ISOPROPYL TOLUENE (p-CYMENE)	99-87-6	NA	NA	NA	NA	NA	NA	NA
SEC-BUTYLBENZENE	135-98-8	ID	1,600	4.00E+08	2.50E+06	1,600	1.80E+08	8.00E+06
TOLUENE	108-88-3	5,400 (I)	16,000 (I)	2.7E+10 (I)	5E+07 (C,I)	16,000 (I)	1.2E+10 (I)	1.6E+08 (C,I)
XYLENE - TOTAL	1330-20-7	820 (I)	5,600 (I)	2.9E+11 (I)	4.1E+08 (C,I)	5600 (I)	1.3E+11 (I)	1E+09 (I)
Organics - Pesticides (ug/kg)								
4,4'-DDD	72-54-8	NLL	NLL	4.40E+07	95,000	NLL	5.60E+07	4.00E+05
4,4'-DDE	72-55-9	NLL	NLL	3.20E+07	45,000	NLL	4.00E+07	1.90E+05
4,4'-DDT	50-29-3	NLL	NLL	3.20E+07	57,000	NLL	4.00E+07	2.80E+05
ALDRIN	309-00-2	NLL	NLL	6.40E+05	1,000	NLL	8.00E+05	4,300
ALPHA-BHC	319-84-6	ID	18	1.70E+06	2,600	71	2.10E+06	12,000
ALPHA-CHLORODANE	5103-71-9	NA	NA	NA	NA	NA	NA	NA
BETA-BHC	319-85-7	ID	37	5.90E+06	5,400	150	7.40E+06	25,000
DIELDRIN	60-57-1	NLL	NLL	6.80E+05	1,100	NLL	8.50E+05	4,700
ENDOSULFAN I	959-98-8	NA	NA	NA	NA	NA	NA	NA
ENDOSULFAN II	33213-65-9	NA	NA	NA	NA	NA	NA	NA
ENDOSULFAN SULFATE	1031-07-8	NA	NA	NA	NA	NA	NA	NA
ENDRIN	72-20-8	NLL	NLL	ID	65,000	NLL	ID	1.90E+05
ENDRIN ALDEHYDE	7421-93-4	NA	NA	NA	NA	NA	NA	NA
ENDRIN KETONE	53494-70-5	NA	NA	NA	NA	NA	NA	NA
GAMMA-CHLORDANE	5103-74-2	NA	NA	NA	NA	NA	NA	NA
HEPTACHLOR EPOXIDE	102-457-3	NLL	NLL	1.20E+06	3,100	NLL	1.50E+06	9,500
METHOXYCHLOR	72-43-5	NA	16,000	ID	1.90E+06	16,000	ID	5.60E+06
Asbestos (%)								
ASBESTOS	ASB	NLL	NLL	1% (1.0E+7 (M); 68,000 ppb)	ID	NLL	1% (1.0E+7 (M); 85,000 ppb)	ID

Geographic Location	QUINCY STAMP SANDS AREA																			
Station Name	QMCM-SB33						QMCM-SB34				QMCM-SB35				QMCM-SB36				SB/TMW-01 (UPEA 2016)	
Field Sample ID	QMCM-SB 33-6"-12"		QMCM-SB 33-1'-4'		QMCM-SB 33-1'-4' dup		QMCM-SB 34-12"-18"		QMCM-SB 34-18"-24"		QMCM-SB 35-12"-18"		QMCM-SB 35-18"-5'		QMCM-SB 36-6"-12"		QMCM-SB 36-12"-2'		SB-01-2	
Sample Date	05/20/17		05/20/17		05/20/17		05/20/17		05/20/17		05/20/17		05/20/17		05/20/17		05/20/17		11/30/16	
Sample Interval (bgs)	0.5 - 1 ft		1 - 4 ft		1 - 4 ft		1 - 1.5 ft		1.5 - 2 ft		1 - 1.5 ft		1.5 - 5 ft		0.5 - 1 ft		1 - 2 ft		2 - 2 ft	
Sample Description	SAND, Fine to medium, gray to 5 ft; saturated at 4 ft		SAND, Fine to medium, gray to 5 ft; saturated at 4 ft		Field Duplicate		SAND, Fine to medium, gray to 5 ft; saturated at 2 ft		SAND, Fine to medium, gray to 5 ft; saturated at 2 ft		SAND, Fine to medium, gray to 5 ft; saturated at 5 ft		SAND, Fine to medium, gray to 5 ft; saturated at 5 ft		SAND, Fine to medium, reddish brown to 2 ft		SAND, Fine to medium, reddish brown to 2 ft		Stamp Sand	
	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Organics - VOCs (ug/kg) (continued)																				
ISOPROPYLBENZENE	<63 U	–	<70 U	–	<69 U	–	<60 U	–	<69 U	–	<60 U	–	<58 U	–	<70 U	–	<71 U	–	<40 U	–
M,P-XYLENE	<130 U	–	<140 U	–	<140 U	–	<120 U	–	<140 U	–	<120 U	–	<120 U	–	<140 U	–	<140 U	–	<79 U	–
METHYLENE CHLORIDE	<130 U	–	<140 U	–	<140 U	–	<120 U	–	<140 U	–	<120 U	–	<120 U	–	<140 U	–	<140 U	–	**84 J**	–
NAPHTHALENE (VOC)	<320 U	–	<350 U	–	<350 U	–	<300 U	–	<350 U	–	<300 U	–	<290 U	–	<350 U	–	<360 U	–	<130 U	–
N-BUTYLBENZENE	<63 U	–	<70 U	–	<69 U	–	<60 U	–	<69 U	–	<60 U	–	<58 U	–	<70 U	–	<71 U	–	–	–
N-PROPYLBENZENE	<63 U	–	<70 U	–	<69 U	–	<60 U	–	<69 U	–	<60 U	–	<58 U	–	<70 U	–	<71 U	–	<40 U	–
O-XYLENE	<63 U	–	<70 U	–	<69 U	–	<60 U	–	<69 U	–	<60 U	–	<58 U	–	<70 U	–	<71 U	–	<40 U	–
P-ISOPROPYL TOLUENE (p-CYMENE)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SEC-BUTYLBENZENE	<63 U	–	<70 U	–	<69 U	–	<60 U	–	<69 U	–	<60 U	–	<58 U	–	<70 U	–	<71 U	–	–	–
TOLUENE	<63 U	–	<70 U	–	<69 U	–	<60 U	–	<69 U	–	<60 U	–	<58 U	–	<70 U	–	<71 U	–	<40 U	–
XYLENE - TOTAL	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	<120 U	–
Organics - Pesticides (ug/kg)																				
4,4'-DDD	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
4,4'-DDE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
4,4'-DDT	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ALDRIN	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ALPHA-BHC	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ALPHA-CHLORODANE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BETA-BHC	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DIELDRIN	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDOSULFAN I	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDOSULFAN II	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDOSULFAN SULFATE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDRIN	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDRIN ALDEHYDE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDRIN KETONE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
GAMMA-CHLORDANE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
HEPTACHLOR EPOXIDE	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
METHOXYCHLOR	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Asbestos (%)																				
ASBESTOS	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

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

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY STAMP SANDS AREA																	
Station Name	**CAS Number**	**[2] Groundwater Surface Water Interface Protection Criteria**	**[4] Residential Drinking Water Protection Criteria**	**[9] Residential Particulate Soil Inhalation Criteria**	**[10] Residential Direct Contact Criteria**	**[11] Nonresidential Drinking Water Protection Criteria**	**[16] Nonresidential Particulate Soil Inhalation Criteria**	**[17] Nonresidential Direct Contact Criteria**	**SB/TMW-02 (UPEA 2016)**		**SB/TMW-03 (UPEA 2016)**		**SB/TMW-04 (UPEA 2016)**		**SB/TMW-05 (UPEA 2016)**		**SB/TMW-06 (UPEA 2016)**		**SB/TMW-07 (UPEA 2016)**		**SB/TMW-08 (UPEA 2016)**		**SB/TMW-09 (UPEA 2016)**		**SB-10 (UPEA 2016)**	
Field Sample ID									SB-02-5		SB-03-7		SB-04-2_5		SB-05-2_5		SB-06-5		SB-07-2_5		SB-08-2_5		SB-09-10		SB-10-15	
Sample Date									12/01/16		11/30/16		11/30/16		11/30/16		11/30/16		11/30/16		12/01/16		12/01/16		12/01/16	
Sample Interval (bgs)									5 - 5 ft		7 - 7 ft		2.5 - 2.5 ft		2.5 - 2.5 ft		5 - 5 ft		2.5 - 2.5 ft		2.5 - 2.5 ft		10 - 10 ft		15 - 15 ft	
Sample Description									Stamp Sand		Stamp Sand		Stamp Sand		Stamp Sand		Stamp Sand		Stamp Sand		Stamp Sand		Stamp Sand		Stamp Sand	
									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	6,900 (B)	ID	50,000 (DD)	6,900 (B)	ID	370,000 (DD)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ANTIMONY	7440-36-0	1.2 (X)	4.3	13,000	180	4.3	5,900	670	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ARSENIC	7440-38-2	4.6	4.6	720	7.6	4.6	910	37	**0.63**	–	**0.59**	–	**0.52**	–	**0.61**	–	**0.56**	–	**0.55**	–	**0.69**	–	**0.54**	–	**0.51**	–
BARIUM	7440-39-3	130	1,300 (G)	330,000	37,000	1,300	150,000	130,000	**8.3**	–	**6.7**	–	**8.3**	–	**7.1**	–	**8.7**	–	**11**	–	**9.4**	–	**6.9**	–	**8.2**	–
BERYLLIUM	7440-41-7	4.6 (G)	51	1,300	410	51	590	1,600	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CADMIUM	7440-43-9	1.6 (G,X)	6.0	1,700	550	6.0	2,200	2,100	<0.28 U	–	<0.36 U	–	<0.34 U	–	<0.33 U	–	<0.41 U	–	<0.36 U	–	<0.37 U	–	<0.28 U	–	<0.28 U	–
CALCIUM	7440-70-2	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CHROMIUM	7440-47-3	1,200,000 (G,H,X)	1,000,000 (D,H)	330,000 (H)	790,000 (H)	1,000,000 (D,H)	150,000 (H)	1,000,000 (D,H)	**22**	–	**25**	–	**24**	–	**23**	–	**26**	–	**27**	–	**26**	–	**23**	–	**23**	–
COBALT	7440-48-4	2.0	0.8	13,000	2,600	2.0	5,900	9,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
COPPER	7440-50-8	32 (G)	5,800	130,000	20,000	5,800	59,000	73,000	**1,300**	[2]	**2,200**	[2]	**550**	[2]	**920**	[2]	**650**	[2]	**620**	[2]	**510**	[2]	**1,100**	[2]	**2,000**	[2]
IRON	7439-89-6	NA	12,000 (B)	ID	160,000	12,000 (B)	ID	580,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
LEAD	7439-92-1	1,900 (G,X)	700	100,000	400	700	44,000	900 (DD)	**5**	–	**4.8**	–	**5**	–	**5.2**	–	**5.7**	–	**5.4**	–	**5.2**	–	**4.9**	–	**4.2**	–
LITHIUM	7439-93-2	9.8 (B)	9.8 (B)	2,300,000	4,200 (DD)	9.8 (B)	1,000,000	31,000 (DD)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MAGNESIUM	7439-95-4	NA	8,000	6,700,000	1,000,000 (D)	22,000	2,900,000	1,000,000 (D)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MANGANESE	7439-96-5	440 (B,G,X)	440 (B)	3,300	25,000	440 (B)	1,500	90,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MERCURY	7439-97-6	0.13 (B, Z)	1.7 (Z)	20000 (Z)	160 (Z)	1.7 (Z)	8800 (Z)	580 (Z)	**0.068**	–	**0.087**	–	**0.075**	–	**0.039**	–	**0.073**	–	**0.086**	–	**0.073**	–	**0.093**	–	**0.1**	–
NICKEL	7440-02-0	29 (G)	100	13,000	40,000	100	16,000	150,000	**31**	[2]	**33**	[2]	**34**	[2]	**34**	[2]	**36**	[2]	**37**	[2]	**35**	[2]	**33**	[2]	**33**	[2]
POTASSIUM	7440-09-7	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SELENIUM	7782-49-2	0.41 (B)	4.0	130,000	2,600	4.0	59,000	9,600	**1.2**	[2]	**1.1**	[2]	**1.1**	[2]	**1.2**	[2]	**1.1**	[2]	**1.2**	[2]	**1.1**	[2]	**1**	[2]	**1.2**	[2]
SILVER	7440-22-4	1.0 (M); 0.027	4.5	6,700	2,500	13	2,900	9,000	**2.4**	[2]	**2**	[2]	**1.1**	[2]	0.83	–	**1.3**	[2]	**1.1**	[2]	0.97	–	**1.3**	[2]	**1.3**	[2]
SODIUM	7440-23-5	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
THALLIUM	7440-28-0	1.4	2.3	13,000	35	2.3	5,900	130	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
VANADIUM	7440-62-2	430	72	ID	750 (DD)	990	ID	5,500 (DD)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ZINC	7440-66-6	62 (G)	2,400	ID	170,000	5,000	ID	630,000	**64**	[2]	**66**	[2]	**66**	[2]	**63**	[2]	**69**	[2]	**72**	[2]	**67**	[2]	**64**	[2]	**62**	–
Inorganics - Cyanide (mg/kg)																										
CYANIDE	57-12-5	0.1 (P,R)	4.0 (P,R)	250 (P,R)	12 (P,R)	4.0 (P,R)	250 (P,R)	250 (P,R)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Organics - PCBs (ug/kg)																										
AROCLOR-1260	11096-82-5	NA	NA	NA	NA	NA	NA	NA	<89 U	–	<98 U	–	<100 U	–	<100 U	–	<100 U	–	<99 U	–	<100 U	–	<91 U	–	<90 U	–
AROCLOR-1262	37324-23-5	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TOTAL PCBS	TPCB	NLL	NLL	5,200,000 (J)	1,000 (J,T)	NLL	6,500,000 (J)	1,000 (J,T)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY STAMP SANDS AREA																	
Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	SB/TMW-02 (UPEA 2016)		SB/TMW-03 (UPEA 2016)		SB/TMW-04 (UPEA 2016)		SB/TMW-05 (UPEA 2016)		SB/TMW-06 (UPEA 2016)		SB/TMW-07 (UPEA 2016)		SB/TMW-08 (UPEA 2016)		SB/TMW-09 (UPEA 2016)		SB-10 (UPEA 2016)	
Field Sample ID									SB-02-5		SB-03-7		SB-04-2_5		SB-05-2_5		SB-06-5		SB-07-2_5		SB-08-2_5		SB-09-10		SB-10-15	
Sample Date									12/01/16		11/30/16		11/30/16		11/30/16		11/30/16		11/30/16		12/01/16		12/01/16		12/01/16	
Sample Interval (bgs)									5 - 5 ft		7 - 7 ft		2.5 - 2.5 ft		2.5 - 2.5 ft		5 - 5 ft		2.5 - 2.5 ft		2.5 - 2.5 ft		10 - 10 ft		15 - 15 ft	
Sample Description									Stamp Sand		Stamp Sand		Stamp Sand		Stamp Sand		Stamp Sand		Stamp Sand		Stamp Sand		Stamp Sand		Stamp Sand	
									Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Organics - SVOCs (ug/kg)																										
1,1'-BIPHENYL	92-52-4	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-METHYLNAPHTHALENE (SVOC)	91-57-6S	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07	<85 U	--	<99 U	--	<96 U	--	<97 U	--	<96 U	--	<94 U	--	<99 U	--	<89 U	--	<84 U	--
ACENAPHTHENE	83-32-9	8,700	300,000	1.4E+10	4.1E+07	880,000	6.2E+09	1.3E+08	<32 U	--	<37 U	--	<36 U	--	<36 U	--	<36 U	--	<35 U	--	<37 U	--	<33 U	--	<31 U	--
ACENAPHTHYLENE	208-96-8	ID	5,900	2.3E+09	1,600,000	17,000	1E+09	5,200,000	<32 U	--	<37 U	--	<36 U	--	<36 U	--	<36 U	--	<35 U	--	<37 U	--	<33 U	--	<31 U	--
ACETOPHENONE	98-86-2	ID	30,000	3.3E+10	4.7E+07 (C)	88,000	1.4E+10	1.5E+08 (C)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ANTHRACENE	120-12-7	ID	41,000	6.7E+10	2.3E+08	41,000	2.9E+10	7.3E+08	<32 U	--	<37 U	--	<36 U	--	<36 U	--	<36 U	--	<35 U	--	<37 U	--	<33 U	--	<31 U	--
BENZO(A)ANTHRACENE	56-55-3	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)	<32 U	--	<37 U	--	<36 U	--	<36 U	--	<36 U	--	<35 U	--	<37 U	--	<33 U	--	<31 U	--
BENZO(A)PYRENE	50-32-8	NLL	NLL	1,500,000 (Q)	2,000 (Q)	NLL	1,900,000 (Q)	8,000 (Q)	<32 U	--	<37 U	--	<36 U	--	<36 U	--	<36 U	--	<35 U	--	<37 U	--	<33 U	--	<31 U	--
BENZO(B)FLUORANTHENE	205-99-2	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)	<32 U	--	<37 U	--	<36 U	--	<36 U	--	<36 U	--	<35 U	--	<37 U	--	<33 U	--	<31 U	--
BENZO(G,H,I)PERYLENE	191-24-2	NLL	NLL	8E+08 (Q)	2,500,000 (Q)	NLL	3.5E+08 (Q)	7,000,000 (Q)	<32 U	--	<37 U	--	<36 U	--	<36 U	--	<36 U	--	<35 U	--	<37 U	--	<33 U	--	<31 U	--
BENZO(K)FLUORANTHENE	207-08-9	NLL	NLL	ID	200,000 (Q)	NLL	ID	800,000 (Q)	<32 U	--	<37 U	--	<36 U	--	<36 U	--	<36 U	--	<35 U	--	<37 U	--	<33 U	--	<31 U	--
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	NLL	NLL	7E+08	2,800,000	NLL	8.9E+08	1.2E+07 (C)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CARBAZOLE	86-74-8	1,100	9,400	6.2E+07	530,000	39,000	7.8E+07	2,400,000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CHRYSENE	218-01-9	NLL	NLL	ID	2,000,000 (Q)	NLL	ID	8,000,000 (Q)	<32 U	--	<37 U	--	<36 U	--	<36 U	--	<36 U	--	<35 U	--	<37 U	--	<33 U	--	<31 U	--
DIBENZO(A,H)ANTHRACENE	53-70-3	NLL	NLL	ID	2,000 (Q)	NLL	ID	8,000 (Q)	<32 U	--	<37 U	--	<36 U	--	<36 U	--	<36 U	--	<35 U	--	<37 U	--	<33 U	--	<31 U	--
DIBENZOFURAN	132-64-9	1,700	ID	6,700,000	ID	ID	2,900,000	ID	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DI-N-BUTYLPHTHALATE	84-74-2	11000	960,000	3.30E+09	2.70E+07	2.7E+6 (C)	1.50E+09	8.7E+7 (C)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FLUORANTHENE	206-44-0	5,500	730,000	9.3E+09	4.6E+07	730,000	4.1E+09	1.3E+08	<32 U	--	<37 U	--	<36 U	--	<36 U	--	<36 U	--	<35 U	--	<37 U	--	<33 U	--	<31 U	--
FLUORENE	86-73-7	5,300	390,000	9.3E+09	2.7E+07	890,000	4.1E+09	8.7E+07	<32 U	--	<37 U	--	<36 U	--	<36 U	--	<36 U	--	<35 U	--	<37 U	--	<33 U	--	<31 U	--
INDENO(1,2,3-CD)PYRENE	193-39-5	NLL	NLL	ID	20,000	NLL	ID	80,000	<32 U	--	<37 U	--	<36 U	--	<36 U	--	<36 U	--	<35 U	--	<37 U	--	<33 U	--	<31 U	--
NAPHTHALENE (SVOC)	91-20-3S	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	<32 U	--	<37 U	--	<36 U	--	<36 U	--	<36 U	--	<35 U	--	<37 U	--	<33 U	--	<31 U	--
PHENANTHRENE	85-01-8	2,100	56,000	6,700,000	1,600,000	160,000	2,900,000	5,200,000	<32 U	--	<37 U	--	<36 U	--	<36 U	--	<36 U	--	<35 U	--	<37 U	--	<33 U	--	<31 U	--
PYRENE	129-00-0	ID	480,000	6.7E+09	2.9E+07	480,000	2.9E+09	8.4E+07	<32 U	--	<37 U	--	<36 U	--	<36 U	--	<36 U	--	<35 U	--	<37 U	--	<33 U	--	<31 U	--
Organics - VOCs (ug/kg)																										
1,2,3-TRIMETHYLBENZENE	526-73-8	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-TRIMETHYLBENZENE	95-63-6	570 (I)	2,100 (I)	8.2E+10 (I)	3.2E+07 (C,I)	2,100 (I)	3.6E+10 (I)	1E+08 (C,I)	<36 U	--	<45 U	--	<46 U	--	<45 U	--	<46 U	--	<58 U	--	<45 U	--	<38 U	--	<38 U	--
1,3,5-TRIMETHYLBENZENE	108-67-8	1,100 (I)	1,800 (I)	8.2E+10 (I)	3.2E+07 (C,I)	1,800 (I)	3.6E+10 (I)	1E+08 (C,I)	<36 U	--	<45 U	--	<46 U	--	<45 U	--	<46 U	--	<58 U	--	<45 U	--	<38 U	--	<38 U	--
2-METHYLNAPHTHALENE (VOC)	91-57-6V	4,200	57,000	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07	<120 U	--	<150 U	--	<150 U	--	<150 U	--	<150 U	--	<190 U	--	<150 U	--	<130 U	--	<130 U	--
BENZENE	71-43-2	240 (I,X)	100 (I)	3.8E+08 (I)	180,000 (I)	100 (I)	4.7E+08 (I)	840,000 (C,I)	<36 U	--	<45 U	--	<46 U	--	<45 U	--	<46 U	--	<58 U	--	<45 U	--	<38 U	--	<38 U	--
CYCLOHEXANE	110-82-7	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
ETHYLBENZENE	100-41-4	360 (I)	1,500 (I)	1E+10 (I)	2.2E+07 (C,I)	1,500 (I)	1.3E+10 (I)	7.1E+07 (C, I)	<36 U	--	<45 U	--	<46 U	--	<45 U	--	<46 U	--	<58 U	--	<45 U	--	<38 U	--	<38 U	--
HEXANE	110-54-3	NA	1.8E+05 (C)	1.30E+10	9.2E+07 (C)	5.1E+5 (C)	5.90E+09	3.0E+8 (C)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY STAMP SANDS AREA																	
Station Name	CAS Number	[2] Groundwater Surface Water Interface Protection Criteria	[4] Residential Drinking Water Protection Criteria	[9] Residential Particulate Soil Inhalation Criteria	[10] Residential Direct Contact Criteria	[11] Nonresidential Drinking Water Protection Criteria	[16] Nonresidential Particulate Soil Inhalation Criteria	[17] Nonresidential Direct Contact Criteria	SB/TMW-02 (UPEA 2016)		SB/TMW-03 (UPEA 2016)		SB/TMW-04 (UPEA 2016)		SB/TMW-05 (UPEA 2016)		SB/TMW-06 (UPEA 2016)		SB/TMW-07 (UPEA 2016)		SB/TMW-08 (UPEA 2016)		SB/TMW-09 (UPEA 2016)		SB-10 (UPEA 2016)	
Field Sample ID									SB-02-5		SB-03-7		SB-04-2_5		SB-05-2_5		SB-06-5		SB-07-2_5		SB-08-2_5		SB-09-10		SB-10-15	
Sample Date									12/01/16		11/30/16		11/30/16		11/30/16		11/30/16		11/30/16		12/01/16		12/01/16		12/01/16	
Sample Interval (bgs)									5 - 5 ft		7 - 7 ft		2.5 - 2.5 ft		2.5 - 2.5 ft		5 - 5 ft		2.5 - 2.5 ft		2.5 - 2.5 ft		10 - 10 ft		15 - 15 ft	
Sample Description									Stamp Sand		Stamp Sand		Stamp Sand		Stamp Sand		Stamp Sand		Stamp Sand		Stamp Sand		Stamp Sand		Stamp Sand	
									Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Organics - VOCs (ug/kg) (continued)																										
ISOPROPYLBENZENE	98-82-8	3,200	91,000	5.8E+09	2.5E+07 (C)	260,000	2.6E+09	8E+07 (C)	<36 U	–	<45 U	–	<46 U	–	<45 U	–	<46 U	–	<58 U	–	<45 U	–	<38 U	–	<38 U	–
M,P-XYLENE	1330-20-7	NA	NA	NA	NA	NA	NA	NA	<72 U	–	<90 U	–	<92 U	–	<89 U	–	<92 U	–	<120 U	–	<90 U	–	<75 U	–	<77 U	–
METHYLENE CHLORIDE	75-09-2	30,000 (X)	100	6.60E+09	1.30E+06	100	8.30E+09	5.8E+6 (C)	**78 J**	–	**76 J**	–	**73 J**	–	**100 J**	–	**87 J**	–	**130 J**	**[4,11]**	**63 J**	–	**44 J**	–	<38 UJ	–
NAPHTHALENE (VOC)	91-20-3V	730	35,000	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	<120 U	–	<150 U	–	<150 U	–	<150 U	–	<150 U	–	<190 U	–	<150 U	–	<130 U	–	<130 U	–
N-BUTYLBENZENE	104-51-8	ID	1,600	2E+09	2,500,000	4,600	8.8E+08	8,000,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
N-PROPYLBENZENE	103-65-1	ID	1,600 (I)	1.3E+09 (I)	2,500,000 (I)	4,600 (I)	5.9E+08 (I)	8,000,000 (I)	<36 U	–	<45 U	–	<46 U	–	<45 U	–	<46 U	–	<58 U	–	<45 U	–	<38 U	–	<38 U	–
O-XYLENE	95-47-6	NA	NA	NA	NA	NA	NA	NA	<36 U	–	<45 U	–	<46 U	–	<45 U	–	<46 U	–	<58 U	–	<45 U	–	<38 U	–	<38 U	–
P-ISOPROPYL TOLUENE (p-CYMENE)	99-87-6	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SEC-BUTYLBENZENE	135-98-8	ID	1,600	4.00E+08	2.50E+06	1,600	1.80E+08	8.00E+06	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TOLUENE	108-88-3	5,400 (I)	16,000 (I)	2.7E+10 (I)	5E+07 (C,I)	16,000 (I)	1.2E+10 (I)	1.6E+08 (C,I)	<36 U	–	<45 U	–	<46 U	–	<45 U	–	<46 U	–	<58 U	–	<45 U	–	<38 U	–	<38 U	–
XYLENE - TOTAL	1330-20-7	820 (I)	5,600 (I)	2.9E+11 (I)	4.1E+08 (C,I)	5600 (I)	1.3E+11 (I)	1E+09 (I)	<110 U	–	<140 U	–	<140 U	–	<130 U	–	<140 U	–	<170 U	–	<140 U	–	<110 U	–	<110 U	–
Organics - Pesticides (ug/kg)																										
4,4'-DDD	72-54-8	NLL	NLL	4.40E+07	95,000	NLL	5.60E+07	4.00E+05	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
4,4'-DDE	72-55-9	NLL	NLL	3.20E+07	45,000	NLL	4.00E+07	1.90E+05	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
4,4'-DDT	50-29-3	NLL	NLL	3.20E+07	57,000	NLL	4.00E+07	2.80E+05	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ALDRIN	309-00-2	NLL	NLL	6.40E+05	1,000	NLL	8.00E+05	4,300	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ALPHA-BHC	319-84-6	ID	18	1.70E+06	2,600	71	2.10E+06	12,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ALPHA-CHLORODANE	5103-71-9	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BETA-BHC	319-85-7	ID	37	5.90E+06	5,400	150	7.40E+06	25,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DIELDRIN	60-57-1	NLL	NLL	6.80E+05	1,100	NLL	8.50E+05	4,700	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDOSULFAN I	959-98-8	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDOSULFAN II	33213-65-9	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDOSULFAN SULFATE	1031-07-8	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDRIN	72-20-8	NLL	NLL	ID	65,000	NLL	ID	1.90E+05	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDRIN ALDEHYDE	7421-93-4	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ENDRIN KETONE	53494-70-5	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
GAMMA-CHLORDANE	5103-74-2	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
HEPTACHLOR EPOXIDE	102-457-3	NLL	NLL	1.20E+06	3,100	NLL	1.50E+06	9,500	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
METHOXYCHLOR	72-43-5	NA	16,000	ID	1.90E+06	16,000	ID	5.60E+06	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Asbestos (%)																										
ASBESTOS	ASB	NLL	NLL	1% (1.0E+7 (M); 68,000 ppb)	ID	NLL	1% (1.0E+7 (M); 85,000 ppb)	ID	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

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

TABLE 5-4
Sample Analytical Summary - Soil
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Soil Table Footnotes:

- MDEQ 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.

- 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. ND indicates that one or more analyte of that group was tested and not detected and a -- indicates not analyzed.

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

- **Bold/Shaded** cells indicate analyte concentration exceeded applicable criteria. MDEQ 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
[3]* - Soil Saturation Concentration Screening Levels
[4] - Residential Drinking Water Protection Criteria
[5]** - Residential Soil Volatilization to Indoor Air Inhalation Criteria (VSIC)
[6]** - Residential Infinite Source Volatile Soil Inhalation Criteria
[7]** - Residential Finite VSIC for 5 Meter Source Thickness
[8]** - Residential Finite VSIC for 2 Meter Source Thickness
[9] - Residential Particulate Soil Inhalation Criteria
[10]- Residential Direct Contact Criteria
[11] - Nonresidential Drinking Water Protection Criteria
[12]* - Nonresidential Soil Volatilization to Indoor Air Inhalation
[13]* - Nonresidential Infinite Source Volatile Soil Inhalation Criteria
[14]* - Nonresidential Finite VSIC for 5 Meter Source Thickness
[15]* - Nonresidential Finite VSIC for 2 Meter Source Thickness
[16] - Nonresidential Particulate Soil Inhalation Criteria
[17] - Nonresidential Direct Contact Criteria

* = Individual criteria for this group are not presented in this table because none were exceeded.

** = Individual criteria for this group are not presented due to limited exceedances. Benzene exceeded [5] which is 1,600 ug/kg in sample SS-7 (9/11/2013), and Phenanthrene exceeded [6], [7], and [8] which are 160,000 ug/kg in sample SS-13 (9/12/2013).

Evaluation based on MDEQ 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.

-- = Not analyzed/Not Reported
bgs = Below ground surface
ft = Feet
in = Inches
mg/kg = Milligrams per kilogram
PCBs = Polychlorinated biphenyls
VOC = Volatile organic compounds
SVOC = Semi-volatile organic compound
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.

(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.

(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 $CaCO_3$/L, use 400 mg $CaCO_3$/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 Environmental Quality (DEQ) internet web site. A hardness value of 47.5 $CaCO_3$/L and pH of 7, derived from the MDEQ 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 DEQ, 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 DEQ, 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 DEQ, 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 DEQ, 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 DEQ, 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 DEQ, 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.

Laboratory Footnotes

J = The result is an estimated quantity
J+ = The result is an estimated quantity, but the result may be biased high
J- = The result is an estimated quantity, but the result may be biased low
ND = Not Detected
R = The data are unusable. The analyte may or may not be present in the sample.
U = Analyte analyzed for but not detected above the reported sample reporting limit.

TABLE 5-5
Sample Analytical Summary - Groundwater
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location	CAS Number	[1] Residential Drinking Water Criteria	[2] Nonresidential Drinking Water Criteria	[3] Groundwater Surface Water Interface Criteria	[4] Water Solubility	[5] Residential Groundwater Volatilization to Indoor Air Inhalation Criteria	[6] Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria	[7] Flammability and Explosivity Screening Level	QUINCY STAMP MILLS AREA																	
Station Name									QMCM-GW01		QMCM-GW02		QMCM-GW03		QMCM-GW04		QMCM-GW12		QMCM-GW13		QMCM-GW14		QMCM-GW15			
Field Sample ID									QMCM-GW01 12-14'		QMCM-GW02 10-12'		QMCM-GW03 10-12'		QMCM-GW04 8-10'		QMCM-GW12 8-13'		QMCM-GW13 8-13'		QMCM-GW14 8-13'		QMCM-GW15 8-13'		QMCM-GW15 8-13' dup	
Sample Date									05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17	
Sample Interval (bgs)									12 - 14 ft		10 - 12 ft		10 - 12 ft		8 - 10 ft		8 - 13 ft		8 - 13 ft		8 - 13 ft		8 - 13 ft		8 - 13 ft	
Sample Description									Temporary Screen Interval: 12 ft - 14 ft		Temporary Screen Interval: 10 ft - 12 ft		Temporary Screen Interval: 10 ft - 12 ft		Temporary Screen Interval: 8 ft - 10 ft		Temporary Screen Interval: 8 ft - 13 ft		Temporary Screen Interval: 8 ft - 13 ft		Temporary Screen Interval: 8 ft - 13 ft		Temporary Screen Interval: 8 ft - 13 ft		Field Duplicate	
									Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Inorganics – Metals (ug/l)																										
ALUMINUM	7429-90-5	50 (V)	50 (V)	NA	NA	NLV	NLV	ID	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ARSENIC	7440-38-2	10 (A)	10 (A)	10	NA	NLV	NLV	ID	23	[1,2,3]	1.2	–	1.3	–	5.6	–	4	–	<1.0 U	–	8.8	–	1.5	–	1.2	–
BARIUM	7440-39-3	2,000 (A)	2,000 (A)	200 (G)	NA	NLV	NLV	ID	120	–	65	–	77	–	94	–	100	–	65	–	240	[3]	76	–	84	–
CADMIUM	7440-43-9	5.0 (A)	5.0 (A)	1.3 (G,X)	NA	NLV	NLV	ID	0.8	–	<0.2 U	–	<0.2 U	–	<0.2 U	–	<0.2 U	–	<0.2 U	–	0.5	–	<0.2 U	–	<0.2 U	–
CALCIUM	7440-70-2	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CHROMIUM	7440-47-3	100 (A,H)	100 (A,H)	40 (G,H,X)	NA	NLV	NLV	ID	47	[3]	1.8	–	4.8	–	5.4	–	40	–	12	–	63	[3]	14	–	19	–
COBALT	7440-48-4	40	100	100	NA	NLV	NLV	ID	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
COPPER	7440-50-8	1,000 (E)	1,000 (E)	4.7 (G)	NA	NLV	NLV	ID	28,000	[1,2,3]	25	[3]	12	[3]	53	[3]	230	[3]	12	[3]	110	[3]	36	[3]	38	[3]
IRON	7439-89-6	300 (E)	300 (E)	NA	NA	NLV	NLV	ID	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
LEAD	7439-92-1	4.0 (L)	4.0 (L)	11 (G,X)	NA	NLV	NLV	ID	140	[1,2,3]	<1.0 U	–	1	–	3.5	–	9.8	[1,2]	<1.0 U	–	16	[1,2,3]	2.8	–	3.6	–
MAGNESIUM	7439-95-4	400,000	1,100,000	NA	NA	NLV	NLV	ID	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MANGANESE	7439-96-5	50 (E)	50 (E)	1,000 (G,X)	NA	NLV	NLV	ID	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MERCURY	7439-97-6	2.0 (A)	2.0 (A)	0.0013	56	56 (S)	56 (S)	ID	1.7	[3]	<0.2 U	–	<0.2 U	–	<0.2 U	–	<0.2 U	–	<0.2 U	–	<0.2 U	–	<0.2 U	–	<0.2 U	–
NICKEL	7440-02-0	100 (A)	100 (A)	28 (G)	NA	NLV	NLV	ID	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
POTASSIUM	7440-09-7	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SELENIUM	7782-49-2	50 (A)	50 (A)	5	NA	NLV	NLV	ID	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	1.9	–	<1.0 U	–	<1.0 U	–
SILVER	7440-22-4	34	98	0.2 (M)	NA	NLV	NLV	ID	25	[3]	<0.2 U	–	<0.2 U	–	<0.2 U	–	0.3	[3]	<0.2 U	–	0.3	[3]	<0.2 U	–	<0.2 U	–
SODIUM	7440-23-5	230, 000 (HH)	350,000	NA	NA	NLV	NLV	ID	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
VANADIUM	7440-62-2	4.5	62	27	NA	NLV	NLV	ID	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ZINC	7440-66-6	2,400	5,000 (E)	63 (G)	NA	NLV	NLV	ID	530	[3]	76	[3]	23	–	110	[3]	240	[3]	35	–	100	[3]	110	[3]	73	[3]
Inorganics – Cyanide (ug/l)																										
CYANIDE (P,R)	57-12-5	200 (A,P,R)	200 (A,P,R)	5.2 (P,R)	NA	NLV	NLV	ID	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Organics - PCBs (ug/l)																										
TOTAL PCBs	TPCB	0.5 (A,J,T)	0.5 (A,J,T)	0.2 (J,M,T)	44.7 (J,T)	45 (J,S,T)	45 (J,S,T)	ID	ND	–	ND	–	ND	–	ND	–	–	–	–	–	–	–	–	–	–	–
Organics - SVOCs (ug/l)																										
1,1'-BIPHENYL	92-52-4	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2-METHYLNAPHTHALENE (SVOC)	91-57-6S	260	750	19	24,600	25,000 (S)	25,000 (S)	ID	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 UJ	–	<5.1 U	–	<5.1 U	–	<5.1 U	–	<5.0 U	–	<5.0 U	–
ACENAPHTHENE	83-32-9	1,300	3,800	38	4,240	4,200 (S)	4,200 (S)	ID	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 UJ	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–
DIBENZOFURAN	132-64-9	ID	ID	4	10,000	10,000 (S)	10,000 (S)	ID	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DI-N-BUTYLPHTHALATE	84-74-2	880	2,500	9.7	11,200	NLV	NLV	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
FLUORENE	86-73-7	880	2,000 (S)	12	1,980	2,000 (S)	2,000 (S)	ID	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 UJ	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–
NAPHTHALENE (SVOC)	91-20-3S	520	1,500	11	31,000	31,000 (S)	31,000 (S)	NA	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 UJ	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–
PHENANTHRENE	85-01-8	52	150	2.0 (M)	1,000	1,000 (S)	1,000 (S)	ID	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 UJ	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–
PYRENE	129-00-0	140 (S)	140 (S)	ID	135	140 (S)	140 (S)	ID	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 UJ	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–

TABLE 5-5
Sample Analytical Summary - Groundwater
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									
Station Name	CAS Number	[1] Residential Drinking Water Criteria	[2] Nonresidential Drinking Water Criteria	[3] Groundwater Surface Water Interface Criteria	[4] Water Solubility	[5] Residential Groundwater Volatilization to Indoor Air Inhalation Criteria	[6] Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria	[7] Flammability and Explosivity Screening Level
Field Sample ID								
Sample Date								
Sample Interval (bgs)								
Sample Description								
Organics - VOCs (ug/l)								
1,2,3-TRIMETHYLBENZENE	526-73-8	NA	NA	NA	NA	NA	NA	NA
1,2,4-TRIMETHYLBENZENE	95-63-6	63 (E,I)	63 (E,I)	17 (I)	55,890 (I)	56,000 (I,S)	56,000 (I,S)	56,000 (I,S)
1,3,5-TRIMETHYLBENZENE	108-67-8	72 (E)	72 (E)	45	61,150	61,000 (S)	61,000 (S)	ID
2-METHYLNAPHTHALENE (VOC)	91-57-6S	260	750	19	24,600	25,000 (S)	25,000 (S)	ID
2-PROPANONE (ACETONE)	67-64-1	730	2,100	1,700	1.00E+09	1.0E+9 (D,S)	1.0E+9 (D,S)	1.50E+07
CHLOROMETHANE	74-87-3	260 (I)	1,100 (I)	ID	6,340,000 (I)	8,600 (I)	45,000 (I)	36,000 (I)
ISOPROPYLBENZENE	98-82-8	800	2,300	28	56,000	56,000 (S)	56,000 (S)	29,000
NAPHTHALENE (VOC)	91-20-3V	520	1,500	11	31,000	31,000 (S)	31,000 (S)	NA
N-BUTYLBENZENE	104-51-8	80	230	ID	NA	ID	ID	ID
N-PROPYLBENZENE	103-65-1	80	230	ID	NA	ID	ID	ID
O-XYLENE	95-47-6	NA	NA	NA	NA	NA	NA	NA
SEC-BUTYLBENZENE	135-98-8	80	230	ID	NA	ID	ID	ID
XYLENE - TOTAL	1330-20-7	280 (E,I)	280 (E,I)	41 (I)	186,000 (I)	190,000 (I,S)	190,000 (I,S)	70,000 (I)
Organics Pesticides (ug/l)								
beta-BHC	319-85-7	0.88	3.6	ID	240	NLV	NLV	ID
delta-BHC	319-86-8	NA	NA	NA	NA	NA	NA	NA
gamma-BHC (Lindane)	58-89-9	0.2 (A)	0.2 (A)	0.03 (M); 0.026	6,800	ID	ID	ID
Field Measurements								
Conductivity (mS/cm)	NA	NA	NA	NA	NA	NA	NA	NA
DO (%)	NA	NA	NA	NA	NA	NA	NA	NA
pH	NA	NA	NA	NA	NA	NA	NA	NA
Temperature (°C)	NA	NA	NA	NA	NA	NA	NA	NA

Geographic Location	QUINCY STAMP MILLS AREA																	
Station Name	QMCM-GW01		QMCM-GW02		QMCM-GW03		QMCM-GW04		QMCM-GW12		QMCM-GW13		QMCM-GW14		QMCM-GW15			
Field Sample ID	QMCM-GW01 12-14'		QMCM-GW02 10-12'		QMCM-GW03 10-12'		QMCM-GW04 8-10'		QMCM-GW12 8-13'		QMCM-GW13 8-13'		QMCM-GW14 8-13'		QMCM-GW15 8-13'		QMCM-GW15 8-13' dup	
Sample Date	05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17		05/17/17	
Sample Interval (bgs)	12 - 14 ft		10 - 12 ft		10 - 12 ft		8 - 10 ft		8 - 13 ft		8 - 13 ft		8 - 13 ft		8 - 13 ft		8 - 13 ft	
Sample Description	Temporary Screen Interval: 12 ft - 14 ft		Temporary Screen Interval: 10 ft - 12 ft		Temporary Screen Interval: 10 ft - 12 ft		Temporary Screen Interval: 8 ft - 10 ft		Temporary Screen Interval: 8 ft - 13 ft		Temporary Screen Interval: 8 ft - 13 ft		Temporary Screen Interval: 8 ft - 13 ft		Temporary Screen Interval: 8 ft - 13 ft		Field Duplicate	
	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Organics - VOCs (ug/l)																		
1,2,3-TRIMETHYLBENZENE	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–
1,2,4-TRIMETHYLBENZENE	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–
1,3,5-TRIMETHYLBENZENE	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–
2-METHYLNAPHTHALENE (VOC)	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–
2-PROPANONE (ACETONE)	<20 U	–	<20 UJ	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–
CHLOROMETHANE	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–
ISOPROPYLBENZENE	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–
NAPHTHALENE (VOC)	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–
N-BUTYLBENZENE	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–
N-PROPYLBENZENE	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–
O-XYLENE	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–
SEC-BUTYLBENZENE	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–
XYLENE - TOTAL	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–
Organics Pesticides (ug/l)																		
beta-BHC	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
delta-BHC	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
gamma-BHC (Lindane)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Field Measurements																		
Conductivity (mS/cm)	**0.369**	–	**0.301**	–	**0.316**	–	**0.269**	–	**0.26**	–	**0.269**	–	**0.169**	–	**0.218**	–	–	–
DO (%)	**32.7**	–	**88**	–	**65**	–	**1.8**	–	**2.2**	–	**70.6**	–	**2.6**	–	**2.5**	–	–	–
pH	**7.47**	–	**7.43**	–	**7.27**	–	**6.96**	–	**6.84**	–	**6.88**	–	**7.02**	–	**6.77**	–	–	–
Temperature (°C)	**8.4**	–	**11.1**	–	**11.8**	–	**9.9**	–	**6.8**	–	**8**	–	**7**	–	**7**	–	–	–

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

TABLE 5-5
Sample Analytical Summary - Groundwater
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Station Name	CAS Number	[1] Residential Drinking Water Criteria	[2] Nonresidential Drinking Water Criteria	[3] Groundwater Surface Water Interface Criteria	[4] Water Solubility	[5] Residential Groundwater Volatilization to Indoor Air Inhalation Criteria	[6] Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria	[7] Flammability and Explosivity Screening Level
Inorganics - Metals (ug/l)								
ALUMINUM	7429-90-5	50 (V)	50 (V)	NA	NA	NLV	NLV	ID
ARSENIC	7440-38-2	10 (A)	10 (A)	10	NA	NLV	NLV	ID
BARIUM	7440-39-3	2,000 (A)	2,000 (A)	200 (G)	NA	NLV	NLV	ID
CADMIUM	7440-43-9	5.0 (A)	5.0 (A)	1.3 (G,X)	NA	NLV	NLV	ID
CALCIUM	7440-70-2	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	7440-47-3	100 (A,H)	100 (A,H)	40 (G,H,X)	NA	NLV	NLV	ID
COBALT	7440-48-4	40	100	100	NA	NLV	NLV	ID
COPPER	7440-50-8	1,000 (E)	1,000 (E)	4.7 (G)	NA	NLV	NLV	ID
IRON	7439-89-6	300 (E)	300 (E)	NA	NA	NLV	NLV	ID
LEAD	7439-92-1	4.0 (L)	4.0 (L)	11 (G,X)	NA	NLV	NLV	ID
MAGNESIUM	7439-95-4	400,000	1,100,000	NA	NA	NLV	NLV	ID
MANGANESE	7439-96-5	50 (E)	50 (E)	1,000 (G,X)	NA	NLV	NLV	ID
MERCURY	7439-97-6	2.0 (A)	2.0 (A)	0.0013	56	56 (S)	56 (S)	ID
NICKEL	7440-02-0	100 (A)	100 (A)	28 (G)	NA	NLV	NLV	ID
POTASSIUM	7440-09-7	NA	NA	NA	NA	NA	NA	NA
SELENIUM	7782-49-2	50 (A)	50 (A)	5	NA	NLV	NLV	ID
SILVER	7440-22-4	34	98	0.2 (M)	NA	NLV	NLV	ID
SODIUM	7440-23-5	230, 000 (HH)	350,000	NA	NA	NLV	NLV	ID
VANADIUM	7440-62-2	4.5	62	27	NA	NLV	NLV	ID
ZINC	7440-66-6	2,400	5,000 (E)	63 (G)	NA	NLV	NLV	ID
Inorganics - Cyanide (ug/l)								
CYANIDE (P,R)	57-12-5	200 (A,P,R)	200 (A,P,R)	5.2 (P,R)	NA	NLV	NLV	ID
Organics - PCBs (ug/l)								
TOTAL PCBs	TPCB	0.5 (A,J,T)	0.5 (A,J,T)	0.2 (J,M,T)	44.7 (J,T)	45 (J,S,T)	45 (J,S,T)	ID
Organics - SVOCs (ug/l)								
1,1'-BIPHENYL	92-52-4	NA	NA	NA	NA	NA	NA	NA
2-METHYLNAPHTHALENE (SVOC)	91-57-6S	260	750	19	24,600	25,000 (S)	25,000 (S)	ID
ACENAPHTHENE	83-32-9	1,300	3,800	38	4,240	4,200 (S)	4,200 (S)	ID
DIBENZOFURAN	132-64-9	ID	ID	4	10,000	10,000 (S)	10,000 (S)	ID
DI-N-BUTYLPHTHALATE	84-74-2	880	2,500	9.7	11,200	NLV	NLV	NA
FLUORENE	86-73-7	880	2,000 (S)	12	1,980	2,000 (S)	2,000 (S)	ID
NAPHTHALENE (SVOC)	91-20-3S	520	1,500	11	31,000	31,000 (S)	31,000 (S)	NA
PHENANTHRENE	85-01-8	52	150	2.0 (M)	1,000	1,000 (S)	1,000 (S)	ID
PYRENE	129-00-0	140 (S)	140 (S)	ID	135	140 (S)	140 (S)	ID

Geographic Location: QUINCY STAMP MILLS AREA

Station Name	QMCM-GW16		QMCM-GW17		QMCM-GW18		QMCM-GW19		QMCM-GW20	
Field Sample ID	QMCM-GW16 10'-15'		QMCM-GW17 10-15'		QMCM-GW18 12-17'		QMCM-GW19-10'-15'		QMCM-GW20 10-15'	
Sample Date	05/17/17		05/18/17		05/18/17		05/17/17		05/18/17	
Sample Interval (bgs)	10 - 15 ft		10 - 15 ft		12 - 17 ft		10 - 15 ft		10 - 15 ft	
Sample Description	Temporary Screen Interval: 10 ft - 15 ft		Temporary Screen Interval: 10 ft - 15 ft		Temporary Screen Interval: 12 ft - 17 ft		Temporary Screen Interval: 10 ft - 15 ft		Temporary Screen Interval: 10 ft - 15 ft	
	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Inorganics - Metals (ug/l)										
ALUMINUM	–	–	–	–	–	–	–	–	–	–
ARSENIC	**2.5**	–	**3.8**	–	<1.0 U	–	**2**	–	<1.0 U	–
BARIUM	**170**	–	**600**	[3]	**54**	–	**130**	–	**73**	–
CADMIUM	<0.2 U	–	**0.3**	–	<0.2 U	–	<0.2 U	–	<0.2 U	–
CALCIUM	–	–	–	–	–	–	–	–	–	–
CHROMIUM	**40**	–	**120**	[1,2,3]	<1.0 U	–	**50**	[3]	**6.1**	–
COBALT	–	–	–	–	–	–	–	–	–	–
COPPER	**62**	[3]	**170**	[3]	**4.8**	[3]	**46**	[3]	**11**	[3]
IRON	–	–	–	–	–	–	–	–	–	–
LEAD	**7.2**	[1,2]	**12**	[1,2,3]	<1.0 U	–	**4.3**	[1,2]	<1.0 U	–
MAGNESIUM	–	–	–	–	–	–	–	–	–	–
MANGANESE	–	–	–	–	–	–	–	–	–	–
MERCURY	<0.2 U	–	<0.2 U	–	<0.2 U	–	<0.2 U	–	<0.2 U	–
NICKEL	–	–	–	–	–	–	–	–	–	–
POTASSIUM	–	–	–	–	–	–	–	–	–	–
SELENIUM	**1.2 J**	–	**1.6**	–	<1.0 U	–	<1.0 U	–	<1.0 U	–
SILVER	<0.2 U	–	**0.3**	[3]	<0.2 U	–	<0.2 U	–	<0.2 U	–
SODIUM	–	–	–	–	–	–	–	–	–	–
VANADIUM	–	–	–	–	–	–	–	–	–	–
ZINC	**120**	[3]	**200**	[3]	**28**	–	**95**	[3]	**95**	[3]
Inorganics - Cyanide (ug/l)										
CYANIDE (P,R)	–	–	–	–	–	–	–	–	–	–
Organics - PCBs (ug/l)										
TOTAL PCBs	–	–	–	–	–	–	–	–	–	–
Organics - SVOCs (ug/l)										
1,1'-BIPHENYL	–	–	–	–	–	–	–	–	–	–
2-METHYLNAPHTHALENE (SVOC)	<5.1 U	–	<5.1 U	–	<5.0 U	–	<5.1 U	–	<5.0 U	–
ACENAPHTHENE	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–
DIBENZOFURAN	–	–	–	–	–	–	–	–	–	–
DI-N-BUTYLPHTHALATE	–	–	–	–	–	–	–	–	–	–
FLUORENE	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–
NAPHTHALENE (SVOC)	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–
PHENANTHRENE	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–
PYRENE	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–

Station Name	QMCM-GW21		QMCM-GW22		QMCM-GW23		TMW-05 (MDEQ 2013)	
Field Sample ID	QMCM-GW 21 10-15'		QMCM-GW22 10-15'		QMCM-GW23 10-15'		E3PY3 & ME3PY3	
Sample Date	05/18/17		05/18/17		05/18/17		09/11/13	
Sample Interval (bgs)	10 - 15 ft		10 - 15 ft		10 - 15 ft		11.32 - 16.32 ft	
Sample Description	Temporary Screen Interval: 10 ft - 15 ft		Temporary Screen Interval: 10 ft - 15 ft		Temporary Screen Interval: 10 ft - 15 ft		Clear	
	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Inorganics - Metals (ug/l)								
ALUMINUM	–	–	–	–	–	–	**492**	[1,2]
ARSENIC	**1.3**	–	**9.1**	–	**1.2**	–	<10 U	–
BARIUM	**110**	–	**970**	[3]	**61**	–	<200 U	–
CADMIUM	<0.2 U	–	**0.7**	–	<0.2 U	–	<5.0 U	–
CALCIUM	–	–	–	–	–	–	**13,700**	–
CHROMIUM	**16**	–	**230**	[1,2,3]	**7.9**	–	<10 U	–
COBALT	–	–	–	–	–	–	<50 U	–
COPPER	**40**	[3]	**380**	[3]	**15**	[3]	**6.3 J**	[3]
IRON	–	–	–	–	–	–	**353**	[1,2]
LEAD	**1.9**	–	**39**	[1,2,3]	**1.2**	–	<10 U	–
MAGNESIUM	–	–	–	–	–	–	**3570 J**	–
MANGANESE	–	–	–	–	–	–	**6.6 J**	–
MERCURY	<0.2 U	–	<0.2 U	–	<0.2 U	–	<0.2 U	–
NICKEL	–	–	–	–	–	–	**2.3 J**	–
POTASSIUM	–	–	–	–	–	–	<5000 U	–
SELENIUM	<1.0 U	–	<1.0 U	–	<1.0 U	–	<35 U	–
SILVER	<0.2 U	–	**0.3**	[3]	<0.2 U	–	<10 U	–
SODIUM	–	–	–	–	–	–	**23,000**	–
VANADIUM	–	–	–	–	–	–	<50 U	–
ZINC	**36**	–	**520**	[3]	**13**	–	<60 U	–
Inorganics - Cyanide (ug/l)								
CYANIDE (P,R)	–	–	–	–	–	–	<10 U	–
Organics - PCBs (ug/l)								
TOTAL PCBs	–	–	–	–	–	–	ND	–
Organics - SVOCs (ug/l)								
1,1'-BIPHENYL	–	–	–	–	–	–	<5.0 U	–
2-METHYLNAPHTHALENE (SVOC)	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–
ACENAPHTHENE	<1.0 U	–	<1.0 U	–	<1.0 U	–	<5.0 U	–
DIBENZOFURAN	–	–	–	–	–	–	<5.0 U	–
DI-N-BUTYLPHTHALATE	–	–	–	–	–	–	<5.0 U	–
FLUORENE	<1.0 U	–	<1.0 U	–	<1.0 U	–	<5.0 U	–
NAPHTHALENE (SVOC)	<1.0 U	–	<1.0 U	–	<1.0 U	–	<5.0 U	–
PHENANTHRENE	<1.0 U	–	<1.0 U	–	<1.0 U	–	<5.0 U	–
PYRENE	<1.0 U	–	<1.0 U	–	<1.0 U	–	<5.0 U	–

TABLE 5-5
Sample Analytical Summary - Groundwater
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY STAMP MILLS AREA																	
Station Name	CAS Number	[1] Residential Drinking Water Criteria	[2] Nonresidential Drinking Water Criteria	[3] Groundwater Surface Water Interface Criteria	[4] Water Solubility	[5] Residential Groundwater Volatilization to Indoor Air Inhalation Criteria	[6] Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria	[7] Flammability and Explosivity Screening Level	QMCM-GW16		QMCM-GW17		QMCM-GW18		QMCM-GW19		QMCM-GW20		QMCM-GW21		QMCM-GW22		QMCM-GW23		TMW-05 (MDEQ 2013)	
Field Sample ID									QMCM-GW16 10'-15'		QMCM-GW17 10-15'		QMCM-GW18 12-17'		QMCM-GW19-10'-15'		QMCM-GW20 10-15'		QMCM-GW 21 10-15'		QMCM-GW22 10-15'		QMCM-GW23 10-15'		E3PY3 & ME3PY3	
Sample Date									05/17/17		05/18/17		05/18/17		05/17/17		05/18/17		05/18/17		05/18/17		05/18/17		09/11/13	
Sample Interval (bgs)									10 - 15 ft		10 - 15 ft		12 - 17 ft		10 - 15 ft		10 - 15 ft		10 - 15 ft		10 - 15 ft		10 - 15 ft		11.32 - 16.32 ft	
Sample Description									Temporary Screen Interval: 10 ft - 15 ft		Temporary Screen Interval: 10 ft - 15 ft		Temporary Screen Interval: 12 ft - 17 ft		Temporary Screen Interval: 10 ft - 15 ft		Temporary Screen Interval: 10 ft - 15 ft		Temporary Screen Interval: 10 ft - 15 ft		Temporary Screen Interval: 10 ft - 15 ft		Temporary Screen Interval: 10 ft - 15 ft		Clear	
									Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Organics - VOCs (ug/l)																										
1,2,3-TRIMETHYLBENZENE	526-73-8	NA	NA	NA	NA	NA	NA	NA	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<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)	55,890 (I)	56,000 (I,S)	56,000 (I,S)	56,000 (I,S)	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	–	–
1,3,5-TRIMETHYLBENZENE	108-67-8	72 (E)	72 (E)	45	61,150	61,000 (S)	61,000 (S)	ID	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	–	–
2-METHYLNAPHTHALENE (VOC)	91-57-6S	260	750	19	24,600	25,000 (S)	25,000 (S)	ID	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	–	–
2-PROPANONE (ACETONE)	67-64-1	730	2,100	1,700	1.00E+09	1.0E+9 (D,S)	1.0E+9 (D,S)	1.50E+07	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 UJ	–	<20 U	–	<20 U	–	**6.8 J**	–
CHLOROMETHANE	74-87-3	260 (I)	1,100 (I)	ID	6,340,000 (I)	8,600 (I)	45,000 (I)	36,000 (I)	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–
ISOPROPYLBENZENE	98-82-8	800	2,300	28	56,000	56,000 (S)	56,000 (S)	29,000	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<5.0 U	–
NAPHTHALENE (VOC)	91-20-3V	520	1,500	11	31,000	31,000 (S)	31,000 (S)	NA	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	–	–
N-BUTYLBENZENE	104-51-8	80	230	ID	NA	ID	ID	ID	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	–	–
N-PROPYLBENZENE	103-65-1	80	230	ID	NA	ID	ID	ID	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	–	–
O-XYLENE	95-47-6	NA	NA	NA	NA	NA	NA	NA	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<5.0 U	–
SEC-BUTYLBENZENE	135-98-8	80	230	ID	NA	ID	ID	ID	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	–	–
XYLENE - TOTAL	1330-20-7	280 (E,I)	280 (E,I)	41 (I)	186,000 (I)	190,000 (I,S)	190,000 (I,S)	70,000 (I)	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–
Organics Pesticides (ug/l)																										
beta-BHC	319-85-7	0.88	3.6	ID	240	NLV	NLV	ID	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	<0.05 U	–
delta-BHC	319-86-8	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	<0.05 U	–
gamma-BHC (Lindane)	58-89-9	0.2 (A)	0.2 (A)	0.03 (M); 0.026	6,800	ID	ID	ID	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	<0.05 U	–
Field Measurements																										
Conductivity (mS/cm)	NA	NA	NA	NA	NA	NA	NA	NA	**0.456**	–	**0.325**	–	**0.273**	–	**0.396**	–	**0.313**	–	**0.369**	–	**0.195**	–	**0.216**	–	–	–
DO (%)	NA	NA	NA	NA	NA	NA	NA	NA	**54**	–	**69.8**	–	**3.6**	–	**8.8**	–	**2**	–	**91**	–	**17.7**	–	**66.8**	–	–	–
pH	NA	NA	NA	NA	NA	NA	NA	NA	**6.7**	–	**7.06**	–	**6.89**	–	**6.81**	–	**6.86**	–	**7.58**	–	**6.2**	–	**6.72**	–	–	–
Temperature (°C)	NA	NA	NA	NA	NA	NA	NA	NA	**7**	–	**6.5**	–	**6.5**	–	**7.3**	–	**6.2**	–	**7.2**	–	**6.5**	–	**6.6**	–	–	–

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

TABLE 5-5
Sample Analytical Summary - Groundwater
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY STAMP MILLS AREA						QUINCY RECLAMATION PLANT AREA											
Station Name	CAS Number	[1] Residential Drinking Water Criteria	[2] Nonresidential Drinking Water Criteria	[3] Groundwater Surface Water Interface Criteria	[4] Water Solubility	[5] Residential Groundwater Volatilization to Indoor Air Inhalation Criteria	[6] Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria	[7] Flammability and Explosivity Screening Level	TMW-06 (MDEQ 2013)		TMW-07 (MDEQ 2013)		TMW-08 (MDEQ 2013)		QMCM-GW09		QMCM-GW24		QMCM-GW25		QMCM-GW26		QMCM-GW27		QMCM-GW28	
Field Sample ID									E3PY4 & ME3PY4		E3PY5 & ME3PY5		E3PY6 & ME3PY6		QMCM-GW 09 10-15'		QMCM-GW 24 10-15'		QMCM-GW 25 10-15'		QMCM-GW 26 8-13		QMCM-GW 27 8-13		QMCM-GW 28 8-13	
Sample Date									09/12/13		09/12/13		09/12/13		05/20/17		05/19/17		05/19/17		05/19/17		05/19/17		05/19/17	
Sample Interval (bgs)									3.06 - 8.06 ft		6.75 - 11.75 ft		7.24 - 12.24 ft		10 - 15 ft		10 - 15 ft		10 - 15 ft		8 - 13 ft		8 - 13 ft		8 - 13 ft	
Sample Description									Clear		Clear		Slightly cloudy		Temporary Screen Interval: 10 ft - 15 ft		Temporary Screen Interval: 10 ft - 15 ft		Temporary Screen Interval: 10 ft - 15 ft		Temporary Screen Interval: 8 ft - 13 ft		Temporary Screen Interval: 8 ft - 13 ft		Temporary Screen Interval: 8 ft - 13 ft	
									Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Inorganics - Metals (ug/l)																										
ALUMINUM	7429-90-5	50 (V)	50 (V)	NA	NA	NLV	NLV	ID	**48.1 J**	–	**288**	[1,2]	**1,200**	[1,2]	–	–	–	–	–	–	–	–	–	–	–	–
ARSENIC	7440-38-2	10 (A)	10 (A)	10	NA	NLV	NLV	ID	<10 U	–	<10 U	–	<10 U	–	<1.0 U	–	–	–	–	–	–	–	–	–	–	–
BARIUM	7440-39-3	2,000 (A)	2,000 (A)	200 (G)	NA	NLV	NLV	ID	<200 U	–	<200 U	–	<200 U	–	**45**	–	–	–	–	–	–	–	–	–	–	–
CADMIUM	7440-43-9	5.0 (A)	5.0 (A)	1.3 (G,X)	NA	NLV	NLV	ID	<5.0 U	–	<5.0 U	–	<5.0 U	–	<0.2 U	–	–	–	–	–	–	–	–	–	–	–
CALCIUM	7440-70-2	NA	NA	NA	NA	NA	NA	NA	**39,200**	–	**18,500**	–	**74,600**	–	–	–	–	–	–	–	–	–	–	–	–	–
CHROMIUM	7440-47-3	100 (A,H)	100 (A,H)	40 (G,H,X)	NA	NLV	NLV	ID	<10 U	–	<10 U	–	**5.1 J**	–	**2.4**	–	–	–	–	–	–	–	–	–	–	–
COBALT	7440-48-4	40	100	100	NA	NLV	NLV	ID	<50 U	–	<50 U	–	**0.62 J**	–	–	–	–	–	–	–	–	–	–	–	–	–
COPPER	7440-50-8	1,000 (E)	1,000 (E)	4.7 (G)	NA	NLV	NLV	ID	<25 U	–	**74.7**	[3]	**1,040**	[1,2,3]	**2,200**	[1,2,3]	–	–	–	–	–	–	–	–	–	–
IRON	7439-89-6	300 (E)	300 (E)	NA	NA	NLV	NLV	ID	**161**	–	**1,110**	[1,2]	**11,900**	[1,2]	–	–	–	–	–	–	–	–	–	–	–	–
LEAD	7439-92-1	4.0 (L)	4.0 (L)	11 (G,X)	NA	NLV	NLV	ID	<10 U	–	**2 J**	–	**11.1**	[1,2,3]	<1.0 U	–	–	–	–	–	–	–	–	–	–	–
MAGNESIUM	7439-95-4	400,000	1,100,000	NA	NA	NLV	NLV	ID	**4390 J**	–	**5,110**	–	**10,300**	–	–	–	–	–	–	–	–	–	–	–	–	–
MANGANESE	7439-96-5	50 (E)	50 (E)	1,000 (G,X)	NA	NLV	NLV	ID	**6.6 J**	–	**116**	[1,2]	**1,500**	[1,2,3]	–	–	–	–	–	–	–	–	–	–	–	–
MERCURY	7439-97-6	2.0 (A)	2.0 (A)	0.0013	56	56 (S)	56 (S)	ID	<0.2 U	–	<0.2 U	–	**0.2 J**	[3]	**0.5**	[3]	–	–	–	–	–	–	–	–	–	–
NICKEL	7440-02-0	100 (A)	100 (A)	28 (G)	NA	NLV	NLV	ID	**4.4 J**	–	**1.4 J**	–	**4.5 J**	–	–	–	–	–	–	–	–	–	–	–	–	–
POTASSIUM	7440-09-7	NA	NA	NA	NA	NA	NA	NA	**432 J-**	–	**226 J-**	–	**2170 J**	–	–	–	–	–	–	–	–	–	–	–	–	–
SELENIUM	7782-49-2	50 (A)	50 (A)	5	NA	NLV	NLV	ID	<35 U	–	**5 J**	–	**4.5 J**	–	<1.0 U	–	–	–	–	–	–	–	–	–	–	–
SILVER	7440-22-4	34	98	0.2 (M)	NA	NLV	NLV	ID	<10 U	–	<10 U	–	**5.8 J**	[3]	**8.3**	[3]	–	–	–	–	–	–	–	–	–	–
SODIUM	7440-23-5	230, 000 (HH)	350,000	NA	NA	NLV	NLV	ID	**22,700**	–	**15,100**	–	**46,900**	–	–	–	–	–	–	–	–	–	–	–	–	–
VANADIUM	7440-62-2	4.5	62	27	NA	NLV	NLV	ID	<50 U	–	<50 U	–	**9.7 J**	[1]	–	–	–	–	–	–	–	–	–	–	–	–
ZINC	7440-66-6	2,400	5,000 (E)	63 (G)	NA	NLV	NLV	ID	<60 U	–	<60 U	–	**170**	[3]	**62**	–	–	–	–	–	–	–	–	–	–	–
Inorganics - Cyanide (ug/l)																										
CYANIDE (P,R)	57-12-5	200 (A,P,R)	200 (A,P,R)	5.2 (P,R)	NA	NLV	NLV	ID	<10 U	–	<10 U	–	<10 U	–	–	–	–	–	–	–	–	–	–	–	–	–
Organics - PCBs (ug/l)																										
TOTAL PCBs	TPCB	0.5 (A,J,T)	0.5 (A,J,T)	0.2 (J,M,T)	44.7 (J,T)	45 (J,S,T)	45 (J,S,T)	ID	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–
Organics - SVOCs (ug/l)																										
1,1'-BIPHENYL	92-52-4	NA	NA	NA	NA	NA	NA	NA	<5.0 U	–	<5.0 U	–	<5.0 U	–	–	–	–	–	–	–	–	–	–	–	–	–
2-METHYLNAPHTHALENE (SVOC)	91-57-6S	260	750	19	24,600	25,000 (S)	25,000 (S)	ID	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	–	–	–	–	–	–	–	–	–	–
ACENAPHTHENE	83-32-9	1,300	3,800	38	4,240	4,200 (S)	4,200 (S)	ID	<5.0 U	–	<5.0 U	–	<5.0 U	–	<1.0 U	–	–	–	–	–	–	–	–	–	–	–
DIBENZOFURAN	132-64-9	ID	ID	4	10,000	10,000 (S)	10,000 (S)	ID	<5.0 U	–	<5.0 U	–	<5.0 U	–	–	–	–	–	–	–	–	–	–	–	–	–
DI-N-BUTYLPHTHALATE	84-74-2	880	2,500	9.7	11,200	NLV	NLV	NA	**1.8 J**	–	**1.5 J**	–	**1 J**	–	–	–	–	–	–	–	–	–	–	–	–	–
FLUORENE	86-73-7	880	2,000 (S)	12	1,980	2,000 (S)	2,000 (S)	ID	<5.0 U	–	<5.0 U	–	<5.0 U	–	<1.0 U	–	–	–	–	–	–	–	–	–	–	–
NAPHTHALENE (SVOC)	91-20-3S	520	1,500	11	31,000	31,000 (S)	31,000 (S)	NA	<5.0 U	–	<5.0 U	–	<5.0 U	–	<1.0 U	–	–	–	–	–	–	–	–	–	–	–
PHENANTHRENE	85-01-8	52	150	2.0 (M)	1,000	1,000 (S)	1,000 (S)	ID	<5.0 U	–	**1.3 J**	–	<5.0 U	–	<1.0 U	–	–	–	–	–	–	–	–	–	–	–
PYRENE	129-00-0	140 (S)	140 (S)	ID	135	140 (S)	140 (S)	ID	<5.0 U	–	**1.7 J**	–	<5.0 U	–	<1.0 U	–	–	–	–	–	–	–	–	–	–	–

TABLE 5-5
Sample Analytical Summary - Groundwater
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY STAMP MILLS AREA						QUINCY RECLAMATION PLANT AREA											
Station Name	CAS Number	[1] Residential Drinking Water Criteria	[2] Nonresidential Drinking Water Criteria	[3] Groundwater Surface Water Interface Criteria	[4] Water Solubility	[5] Residential Groundwater Volatilization to Indoor Air Inhalation Criteria	[6] Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria	[7] Flammability and Explosivity Screening Level	TMW-06 (MDEQ 2013)		TMW-07 (MDEQ 2013)		TMW-08 (MDEQ 2013)		QMCM-GW09		QMCM-GW24		QMCM-GW25		QMCM-GW26		QMCM-GW27		QMCM-GW28	
Field Sample ID									E3PY4 & ME3PY4		E3PY5 & ME3PY5		E3PY6 & ME3PY6		QMCM-GW 09 10-15'		QMCM-GW 24 10-15'		QMCM-GW 25 10-15'		QMCM-GW 26 8-13		QMCM-GW 27 8-13		QMCM-GW 28 8-13	
Sample Date									09/12/13		09/12/13		09/12/13		05/20/17		05/19/17		05/19/17		05/19/17		05/19/17		05/19/17	
Sample Interval (bgs)									3.06 - 8.06 ft		6.75 - 11.75 ft		7.24 - 12.24 ft		10 - 15 ft		10 - 15 ft		10 - 15 ft		8 - 13 ft		8 - 13 ft		8 - 13 ft	
Sample Description									Clear		Clear		Slightly cloudy		Temporary Screen Interval: 10 ft - 15 ft		Temporary Screen Interval: 10 ft - 15 ft		Temporary Screen Interval: 10 ft - 15 ft		Temporary Screen Interval: 8 ft - 13 ft		Temporary Screen Interval: 8 ft - 13 ft		Temporary Screen Interval: 8 ft - 13 ft	
									Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Organics - VOCs (ug/l)																										
1,2,3-TRIMETHYLBENZENE	526-73-8	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	<1.0 U	–	–	–	–	–	–	–	–	–	–	–
1,2,4-TRIMETHYLBENZENE	95-63-6	63 (E,I)	63 (E,I)	17 (I)	55,890 (I)	56,000 (I,S)	56,000 (I,S)	56,000 (I,S)	–	–	–	–	–	–	<1.0 U	–	–	–	–	–	–	–	–	–	–	–
1,3,5-TRIMETHYLBENZENE	108-67-8	72 (E)	72 (E)	45	61,150	61,000 (S)	61,000 (S)	ID	–	–	–	–	–	–	<1.0 U	–	–	–	–	–	–	–	–	–	–	–
2-METHYLNAPHTHALENE (VOC)	91-57-6S	260	750	19	24,600	25,000 (S)	25,000 (S)	ID	–	–	–	–	–	–	<5.0 U	–	–	–	–	–	–	–	–	–	–	–
2-PROPANONE (ACETONE)	67-64-1	730	2,100	1,700	1.00E+09	1.0E+9 (D,S)	1.0E+9 (D,S)	1.50E+07	**7.5 J**	–	**6.8 J**	–	**7.6 J**	–	<20 UJ	–	–	–	–	–	–	–	–	–	–	–
CHLOROMETHANE	74-87-3	260 (I)	1,100 (I)	ID	6,340,000 (I)	8,600 (I)	45,000 (I)	36,000 (I)	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	–	–	–	–	–	–	–	–	–	–
ISOPROPYLBENZENE	98-82-8	800	2,300	28	56,000	56,000 (S)	56,000 (S)	29,000	<5.0 U	–	<5.0 U	–	<5.0 U	–	<1.0 U	–	–	–	–	–	–	–	–	–	–	–
NAPHTHALENE (VOC)	91-20-3V	520	1,500	11	31,000	31,000 (S)	31,000 (S)	NA	–	–	–	–	–	–	<5.0 U	–	–	–	–	–	–	–	–	–	–	–
N-BUTYLBENZENE	104-51-8	80	230	ID	NA	ID	ID	ID	–	–	–	–	–	–	<1.0 U	–	–	–	–	–	–	–	–	–	–	–
N-PROPYLBENZENE	103-65-1	80	230	ID	NA	ID	ID	ID	–	–	–	–	–	–	<1.0 U	–	–	–	–	–	–	–	–	–	–	–
O-XYLENE	95-47-6	NA	NA	NA	NA	NA	NA	NA	<5.0 U	–	<5.0 U	–	<5.0 U	–	<1.0 U	–	–	–	–	–	–	–	–	–	–	–
SEC-BUTYLBENZENE	135-98-8	80	230	ID	NA	ID	ID	ID	–	–	–	–	–	–	<1.0 U	–	–	–	–	–	–	–	–	–	–	–
XYLENE - TOTAL	1330-20-7	280 (E,I)	280 (E,I)	41 (I)	186,000 (I)	190,000 (I,S)	190,000 (I,S)	70,000 (I)	ND	–	ND	–	ND	–	ND	–	–	–	–	–	–	–	–	–	–	–
Organics Pesticides (ug/l)																										
beta-BHC	319-85-7	0.88	3.6	ID	240	NLV	NLV	ID	<0.05 U	–	<0.05 U	–	<0.05 U	–	–	–	–	–	–	–	–	–	–	–	–	–
delta-BHC	319-86-8	NA	NA	NA	NA	NA	NA	NA	<0.05 U	–	<0.05 U	–	<0.05 U	–	–	–	–	–	–	–	–	–	–	–	–	–
gamma-BHC (Lindane)	58-89-9	0.2 (A)	0.2 (A)	0.03 (M); 0.026	6,800	ID	ID	ID	<0.05 U	–	<0.05 U	–	<0.05 U	–	–	–	–	–	–	–	–	–	–	–	–	–
Field Measurements																										
Conductivity (mS/cm)	NA	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	**0.439**	–	**0.56**	–	**0.173**	–	**0.173**	–	–	–
DO (%)	NA	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	**82**	–	**75.7**	–	**62.2**	–	**62.2**	–	–	–
pH	NA	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	**6.78**	–	**7.06**	–	**6.98**	–	**6.98**	–	–	–
Temperature (°C)	NA	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	**10**	–	**8.3**	–	**7.1**	–	**7.1**	–	–	–

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

TABLE 5-5
Sample Analytical Summary - Groundwater
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY RECLAMATION PLANT AREA																	
Station Name	CAS Number	[1] Residential Drinking Water Criteria	[2] Nonresidential Drinking Water Criteria	[3] Groundwater Surface Water Interface Criteria	[4] Water Solubility	[5] Residential Groundwater Volatilization to Indoor Air Inhalation Criteria	[6] Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria	[7] Flammability and Explosivity Screening Level	QMCM-GW29		QMCM-GW30		QMCM-GW30		QMCM-GW31		QMCM-GW43		QMCM-GW44		TMW-01 (MDEQ 2013)		TMW-02 (MDEQ 2013)		TMW-02 (MDEQ 2013)	
Field Sample ID									QMCM-GW 29 8-13		QMCM-GW 30-12'-17'		QMCM-GW 30-12'-17' dup		QMCM-GW 31-12'-17'		QMCM-GW 43 4-9'		QMCM-GW 44 4-9'		E3PX8 & ME3PX8		E3PX9 & ME3PX9		E3PY0 & ME3PY0	
Sample Date									05/19/17		05/18/17		05/18/17		05/18/17		09/17/17		09/17/17		09/11/13		09/11/13		09/11/13	
Sample Interval (bgs)									8 - 13 ft		12 - 17 ft		12 - 17 ft		12 - 17 ft		4 - 9 ft		4 - 9 ft		11.89 - 16.89 ft		6.25 - 11.25 ft		6.25 - 11.25 ft	
Sample Description									Temporary Screen Interval: 8 ft - 13 ft		Temporary Screen Interval: 12 ft - 17 ft		Field Duplicate		Temporary Screen Interval: 12 ft - 17 ft		Temporary Screen Interval: 4 ft - 9 ft		Temporary Screen Interval: 4 ft - 9 ft		Clear		Clear		Field Duplicate	
									Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Inorganics - Metals (ug/l)																										
ALUMINUM	7429-90-5	50 (V)	50 (V)	NA	NA	NLV	NLV	ID	–	–	–	–	–	–	–	–	–	–	–	–	34.5 J	–	181 J	[1,2]	170 J	[1,2]
ARSENIC	7440-38-2	10 (A)	10 (A)	10	NA	NLV	NLV	ID	–	–	1.1	–	<1.0 U	–	3.9	–	–	–	–	–	<10 U	–	<10 U	–	<10 U	–
BARIUM	7440-39-3	2,000 (A)	2,000 (A)	200 (G)	NA	NLV	NLV	ID	–	–	150	–	150	–	150	–	–	–	–	–	484	[3]	<200 U	–	<200 U	–
CADMIUM	7440-43-9	5.0 (A)	5.0 (A)	1.3 (G,X)	NA	NLV	NLV	ID	–	–	<0.2 U	–	<0.2 U	–	<0.2 U	–	–	–	–	–	<5.0 U	–	<5.0 U	–	<5.0 U	–
CALCIUM	7440-70-2	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	46,500	–	62,300	–	65,200	–
CHROMIUM	7440-47-3	100 (A,H)	100 (A,H)	40 (G,H,X)	NA	NLV	NLV	ID	–	–	10	–	7.1	–	25	–	–	–	–	–	<10 U	–	<10 U	–	<10 U	–
COBALT	7440-48-4	40	100	100	NA	NLV	NLV	ID	–	–	–	–	–	–	–	–	–	–	–	–	<50 U	–	<50 U	–	<50 U	–
COPPER	7440-50-8	1,000 (E)	1,000 (E)	4.7 (G)	NA	NLV	NLV	ID	–	–	110	[3]	74	[3]	76	[3]	–	–	–	–	4 J	–	694	[3]	653	[3]
IRON	7439-89-6	300 (E)	300 (E)	NA	NA	NLV	NLV	ID	–	–	–	–	–	–	–	–	–	–	–	–	39.9 J	–	459	[1,2]	257	–
LEAD	7439-92-1	4.0 (L)	4.0 (L)	11 (G,X)	NA	NLV	NLV	ID	–	–	33	[1,2,3]	22	[1,2,3]	3.6	–	–	–	–	–	1.9 J	–	3.5 J	–	<10 U	–
MAGNESIUM	7439-95-4	400,000	1,100,000	NA	NA	NLV	NLV	ID	–	–	–	–	–	–	–	–	–	–	–	–	12,900	–	4110 J	–	4320 J	–
MANGANESE	7439-96-5	50 (E)	50 (E)	1,000 (G,X)	NA	NLV	NLV	ID	–	–	–	–	–	–	–	–	–	–	–	–	12 J	–	239	[1,2]	249	[1,2]
MERCURY	7439-97-6	2.0 (A)	2.0 (A)	0.0013	56	56 (S)	56 (S)	ID	–	–	<0.2 U	–	<0.2 U	–	<0.2 U	–	–	–	–	–	<0.2 U	–	0.042 J	[3]	0.03 J	[3]
NICKEL	7440-02-0	100 (A)	100 (A)	28 (G)	NA	NLV	NLV	ID	–	–	–	–	–	–	–	–	–	–	–	–	<40 U	–	1.1 J	–	1.9 J	–
POTASSIUM	7440-09-7	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	3,830 J	–	3,380 J	–	3,690 J	–
SELENIUM	7782-49-2	50 (A)	50 (A)	5	NA	NLV	NLV	ID	–	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	–	–	–	–	<35 U	–	<35 U	–	<35 U	–
SILVER	7440-22-4	34	98	0.2 (M)	NA	NLV	NLV	ID	–	–	0.3	[3]	<0.2 U	–	<0.2 U	–	–	–	–	–	<10 U	–	0.78 J	[3]	0.78 J	[1]
SODIUM	7440-23-5	230, 000 (HH)	350,000	NA	NA	NLV	NLV	ID	–	–	–	–	–	–	–	–	–	–	–	–	79,500	–	6,320	–	6,650	–
VANADIUM	7440-62-2	4.5	62	27	NA	NLV	NLV	ID	–	–	–	–	–	–	–	–	–	–	–	–	7.1 J	[1]	<50 U	–	<50 U	–
ZINC	7440-66-6	2,400	5,000 (E)	63 (G)	NA	NLV	NLV	ID	–	–	130	[3]	97	[3]	20	–	–	–	–	–	<60 U	–	<60 U	–	<60 U	–
Inorganics - Cyanide (ug/l)																										
CYANIDE (P,R)	57-12-5	200 (A,P,R)	200 (A,P,R)	5.2 (P,R)	NA	NLV	NLV	ID	–	–	–	–	–	–	–	–	–	–	–	–	<10 U	–	<10 U	–	<10 U	–
Organics - PCBs (ug/l)																										
TOTAL PCBs	TPCB	0.5 (A,J,T)	0.5 (A,J,T)	0.2 (J,M,T)	44.7 (J,T)	45 (J,S,T)	45 (J,S,T)	ID	ND	–	ND	–	ND	–	ND	–	–	–	–	–	ND	–	ND	–	ND	–
Organics - SVOCs (ug/l)																										
1,1'-BIPHENYL	92-52-4	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	<5.0 U	–	<5.0 U	–	<5.0 U	–
2-METHYLNAPHTHALENE (SVOC)	91-57-6S	260	750	19	24,600	25,000 (S)	25,000 (S)	ID	–	–	5.8	–	5	–	31	[3]	8.5 J	–	5.3	–	<5.0 U	–	<5.0 U	–	<5.0 U	–
ACENAPHTHENE	83-32-9	1,300	3,800	38	4,240	4,200 (S)	4,200 (S)	ID	–	–	6.1	–	5.7	–	1.4	–	1.1 J	–	1.4	–	<5.0 U	–	<5.0 U	–	<5.0 U	–
DIBENZOFURAN	132-64-9	ID	ID	4	10,000	10,000 (S)	10,000 (S)	ID	–	–	–	–	–	–	–	–	–	–	–	–	<5.0 U	–	<5.0 U	–	<5.0 U	–
DI-N-BUTYLPHTHALATE	84-74-2	880	2,500	9.7	11,200	NLV	NLV	NA	–	–	–	–	–	–	–	–	–	–	–	–	<5.0 U	–	<5.0 U	–	<5.0 U	–
FLUORENE	86-73-7	880	2,000 (S)	12	1,980	2,000 (S)	2,000 (S)	ID	–	–	6.3	–	6.2	–	2.1	–	<1.0 UJ	–	1.1	–	<5.0 U	–	<5.0 U	–	<5.0 U	–
NAPHTHALENE (SVOC)	91-20-3S	520	1,500	11	31,000	31,000 (S)	31,000 (S)	NA	–	–	3.2	–	2.8	–	9.6	–	6.7 J	–	12	[3]	<5.0 U	–	<5.0 U	–	<5.0 U	–
PHENANTHRENE	85-01-8	52	150	2.0 (M)	1,000	1,000 (S)	1,000 (S)	ID	–	–	8.5	[3]	8.6	[3]	5.5	[3]	<1.0 UJ	–	<1.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–
PYRENE	129-00-0	140 (S)	140 (S)	ID	135	140 (S)	140 (S)	ID	–	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 UJ	–	<1.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–

TABLE 5-5
Sample Analytical Summary - Groundwater
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY RECLAMATION PLANT AREA																	
Station Name	CAS Number	[1] Residential Drinking Water Criteria	[2] Nonresidential Drinking Water Criteria	[3] Groundwater Surface Water Interface Criteria	[4] Water Solubility	[5] Residential Groundwater Volatilization to Indoor Air Inhalation Criteria	[6] Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria	[7] Flammability and Explosivity Screening Level	QMCM-GW29		QMCM-GW30		QMCM-GW30		QMCM-GW31		QMCM-GW43		QMCM-GW44		TMW-01 (MDEQ 2013)		TMW-02 (MDEQ 2013)		TMW-02 (MDEQ 2013)	
Field Sample ID									QMCM-GW 29 8-13		QMCM-GW 30-12'-17'		QMCM-GW 30-12'-17' dup		QMCM-GW 31-12'-17'		QMCM-GW 43 4-9'		QMCM-GW 44 4-9'		E3PX8 & ME3PX8		E3PX9 & ME3PX9		E3PY0 & ME3PY0	
Sample Date									05/19/17		05/18/17		05/18/17		05/18/17		09/17/17		09/17/17		09/11/13		09/11/13		09/11/13	
Sample Interval (bgs)									8 - 13 ft		12 - 17 ft		12 - 17 ft		12 - 17 ft		4 - 9 ft		4 - 9 ft		11.89 - 16.89 ft		6.25 - 11.25 ft		6.25 - 11.25 ft	
Sample Description									Temporary Screen Interval: 8 ft - 13 ft		Temporary Screen Interval: 12 ft - 17 ft		Field Duplicate		Temporary Screen Interval: 12 ft - 17 ft		Temporary Screen Interval: 4 ft - 9 ft		Temporary Screen Interval: 4 ft - 9 ft		Clear		Clear		Field Duplicate	
									Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Organics - VOCs (ug/l)																										
1,2,3-TRIMETHYLBENZENE	526-73-8	NA	NA	NA	NA	NA	NA	NA	–	–	**13**	–	**13**	–	**2.4**	–	**2.7**	–	**5.1**	–	–	–	–	–	–	–
1,2,4-TRIMETHYLBENZENE	95-63-6	63 (E,I)	63 (E,I)	17 (I)	55,890 (I)	56,000 (I,S)	56,000 (I,S)	56,000 (I,S)	–	–	**21**	[3]	**20**	[3]	**7.8**	–	**9.1**	–	**14**	–	–	–	–	–	–	–
1,3,5-TRIMETHYLBENZENE	108-67-8	72 (E)	72 (E)	45	61,150	61,000 (S)	61,000 (S)	ID	–	–	**0.98 J**	–	<1.0 U	–	**1.4**	–	<1.0 U	–	**1.8**	–	–	–	–	–	–	–
2-METHYLNAPHTHALENE (VOC)	91-57-6S	260	750	19	24,600	25,000 (S)	25,000 (S)	ID	–	–	**10**	–	**9.7**	–	**47**	[3]	**22**	[3]	**17**	–	–	–	–	–	–	–
2-PROPANONE (ACETONE)	67-64-1	730	2,100	1,700	1.00E+09	1.0E+9 (D,S)	1.0E+9 (D,S)	1.50E+07	–	–	<20 UJ	–	<20 UJ	–	<20 UJ	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–	<20 U	–
CHLOROMETHANE	74-87-3	260 (I)	1,100 (I)	ID	6,340,000 (I)	8,600 (I)	45,000 (I)	36,000 (I)	–	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	**12**	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–
ISOPROPYLBENZENE	98-82-8	800	2,300	28	56,000	56,000 (S)	56,000 (S)	29,000	–	–	**1.1**	–	**1.1**	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–
NAPHTHALENE (VOC)	91-20-3V	520	1,500	11	31,000	31,000 (S)	31,000 (S)	NA	–	–	<5.0 U	–	<5.0 U	–	**21**	[3]	**17**	[3]	**33**	[3]	–	–	–	–	–	–
N-BUTYLBENZENE	104-51-8	80	230	ID	NA	ID	ID	ID	–	–	**6.1**	–	**6**	–	<1.0 U	–	**1.3**	–	**1.6**	–	–	–	–	–	–	–
N-PROPYLBENZENE	103-65-1	80	230	ID	NA	ID	ID	ID	–	–	**4.1**	–	**3.9**	–	**1.4**	–	<1.0 U	–	**1.3**	–	–	–	–	–	–	–
O-XYLENE	95-47-6	NA	NA	NA	NA	NA	NA	NA	–	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	**1.3**	–	<5.0 U	–	<5.0 U	–	<5.0 U	–
SEC-BUTYLBENZENE	135-98-8	80	230	ID	NA	ID	ID	ID	–	–	**3.1**	–	**3**	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	–	–	–	–	–	–
XYLENE - TOTAL	1330-20-7	280 (E,I)	280 (E,I)	41 (I)	186,000 (I)	190,000 (I,S)	190,000 (I,S)	70,000 (I)	–	–	ND	–	ND	–	ND	–	ND	–	**1.3**	–	ND	–	ND	–	ND	–
Organics Pesticides (ug/l)																										
beta-BHC	319-85-7	0.88	3.6	ID	240	NLV	NLV	ID	–	–	–	–	–	–	–	–	–	–	–	–	<0.05 U	–	<0.05 U	–	<0.05 U	–
delta-BHC	319-86-8	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	<0.05 U	–	<0.05 U	–	<0.05 U	–
gamma-BHC (Lindane)	58-89-9	0.2 (A)	0.2 (A)	0.03 (M), 0.026	6,800	ID	ID	ID	–	–	–	–	–	–	–	–	–	–	–	–	<0.05 U	–	<0.05 U	–	<0.05 U	–
Field Measurements																										
Conductivity (mS/cm)	NA	NA	NA	NA	NA	NA	NA	NA	**0.35**	–	**0.19**	–	–	–	**0.209**	–	**0.361**	–	**0.284**	–	–	–	–	–	–	–
DO (%)	NA	NA	NA	NA	NA	NA	NA	NA	**86.4**	–	**2.6**	–	–	–	**2.2**	–	**2.5**	–	**2**	–	–	–	–	–	–	–
pH	NA	NA	NA	NA	NA	NA	NA	NA	**7.16**	–	**6.84**	–	–	–	**7.18**	–	**6.57**	–	**6.22**	–	–	–	–	–	–	–
Temperature (°C)	NA	NA	NA	NA	NA	NA	NA	NA	**11.6**	–	**6**	–	–	–	**6.2**	–	**13.7**	–	**12.8**	–	–	–	–	–	–	–

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

TABLE 5-5
Sample Analytical Summary - Groundwater
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY RECLAMATION PLANT AREA						QUINCY STAMP SANDS AREA											
Station Name	CAS Number	[1] Residential Drinking Water Criteria	[2] Nonresidential Drinking Water Criteria	[3] Groundwater Surface Water Interface Criteria	[4] Water Solubility	[5] Residential Groundwater Volatilization to Indoor Air Inhalation Criteria	[6] Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria	[7] Flammability and Explosivity Screening Level	TMW-03 (MDEQ 2013)		TMW-03 (MDEQ 2013)		TMW-04 (MDEQ 2013)		QMCM-GW32		QMCM-GW33		QMCM-GW34		QMCM-GW35		QMCM-GW36		SB/TMW-01 (UPEA 2016)	
Field Sample ID									E3PY1 & ME3PY1		ME3PY1D		E3PY2 & ME3PY2		QMCM-GW 32-10'-15'		QMCM-GW 33-10'-15'		QMCM-GW 34-8-13'		QMCM-GW 35-12'-17'		QMCM-GW 36 8-13		TMW-01	
Sample Date									09/11/13		09/11/13		09/11/13		05/20/17		05/20/17		05/20/17		05/20/17		05/20/17		11/30/16	
Sample Interval (bgs)									6.99 - 11.99 ft		6.99 - 11.99 ft		7.16 - 12.16 ft		10 - 15 ft		10 - 15 ft		8 - 13 ft		12 - 17 ft		8 - 13 ft		2 - 7 ft	
Sample Description									Clear but dark tint		Clear but dark tint		Clear but orange tint		Temporary Screen Interval: 10 ft - 15 ft		Temporary Screen Interval: 10 ft - 15 ft		Temporary Screen Interval: 8 ft - 13 ft		Temporary Screen Interval: 12 ft - 17 ft		Temporary Screen Interval: 8 ft - 13 ft		Stamp Sand	
									Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Inorganics - Metals (ug/l)																										
ALUMINUM	7429-90-5	50 (V)	50 (V)	NA	NA	NLV	NLV	ID	784	[1,2]	825	[1,2]	341	[1,2]	–	–	–	–	–	–	–	–	–	–	–	–
ARSENIC	7440-38-2	10 (A)	10 (A)	10	NA	NLV	NLV	ID	<10 U	–	<10 U	–	<10 U	–	–	–	–	–	–	–	–	–	–	–	<5.0 U	–
BARIUM	7440-39-3	2,000 (A)	2,000 (A)	200 (G)	NA	NLV	NLV	ID	<200 U	–	<200 U	–	<200 U	–	–	–	–	–	–	–	–	–	–	–	20	–
CADMIUM	7440-43-9	5.0 (A)	5.0 (A)	1.3 (G,X)	NA	NLV	NLV	ID	<5.0 U	–	<5.0 U	–	<5.0 U	–	–	–	–	–	–	–	–	–	–	–	<1.0 U	–
CALCIUM	7440-70-2	NA	NA	NA	NA	NA	NA	NA	40,100	–	40,900	–	33,300	–	–	–	–	–	–	–	–	–	–	–	–	–
CHROMIUM	7440-47-3	100 (A,H)	100 (A,H)	40 (G,H,X)	NA	NLV	NLV	ID	9.1 J	–	10.2	–	4.8 J	–	–	–	–	–	–	–	–	–	–	–	<5.0 U	–
COBALT	7440-48-4	40	100	100	NA	NLV	NLV	ID	0.71 J	–	0.7 J	–	<50 U	–	–	–	–	–	–	–	–	–	–	–	–	–
COPPER	7440-50-8	1,000 (E)	1,000 (E)	4.7 (G)	NA	NLV	NLV	ID	13.5 J	[3]	15.4 J	[3]	<25 U	–	–	–	–	–	–	–	–	–	–	–	190	[3]
IRON	7439-89-6	300 (E)	300 (E)	NA	NA	NLV	NLV	ID	9,720	[1,2]	10,100	[1,2]	10,700	[1,2]	–	–	–	–	–	–	–	–	–	–	–	–
LEAD	7439-92-1	4.0 (L)	4.0 (L)	11 (G,X)	NA	NLV	NLV	ID	5.4 J	[1,2]	5.7 J	[1,2]	3.2 J	–	–	–	–	–	–	–	–	–	–	–	<3.0 U	–
MAGNESIUM	7439-95-4	400,000	1,100,000	NA	NA	NLV	NLV	ID	3590 J	–	3710 J	–	3120 J	–	–	–	–	–	–	–	–	–	–	–	–	–
MANGANESE	7439-96-5	50 (E)	50 (E)	1,000 (G,X)	NA	NLV	NLV	ID	180	[1,2]	184	[1,2]	547	[1,2]	–	–	–	–	–	–	–	–	–	–	44	–
MERCURY	7439-97-6	2.0 (A)	2.0 (A)	0.0013	56	56 (S)	56 (S)	ID	<0.2 U	–	<0.2 U	–	<0.2 U	–	–	–	–	–	–	–	–	–	–	–	<0.2 U	–
NICKEL	7440-02-0	100 (A)	100 (A)	28 (G)	NA	NLV	NLV	ID	8 J	–	10.3 J	–	2.5 J	–	–	–	–	–	–	–	–	–	–	–	<5.0 U	–
POTASSIUM	7440-09-7	NA	NA	NA	NA	NA	NA	NA	4,260 J	–	4,440 J	–	2,800 J	–	–	–	–	–	–	–	–	–	–	–	–	–
SELENIUM	7782-49-2	50 (A)	50 (A)	5	NA	NLV	NLV	ID	5.2 J	[3]	<35 U	–	<35 U	–	–	–	–	–	–	–	–	–	–	–	<5.0 U	–
SILVER	7440-22-4	34	98	0.2 (M)	NA	NLV	NLV	ID	0.85 J	[3]	0.91 J	[3]	1.2 J	[3]	–	–	–	–	–	–	–	–	–	–	0.2	–
SODIUM	7440-23-5	230, 000 (HH)	350,000	NA	NA	NLV	NLV	ID	11,000	–	11,300	–	12,000	–	–	–	–	–	–	–	–	–	–	–	–	–
VANADIUM	7440-62-2	4.5	62	27	NA	NLV	NLV	ID	15.7 J	[1]	14.8 J	[1]	<50 U	–	–	–	–	–	–	–	–	–	–	–	–	–
ZINC	7440-66-6	2,400	5,000 (E)	63 (G)	NA	NLV	NLV	ID	84.9	[3]	101	[3]	79.8 J+	[3]	–	–	–	–	–	–	–	–	–	–	18	–
Inorganics - Cyanide (ug/l)																										
CYANIDE (P,R)	57-12-5	200 (A,P,R)	200 (A,P,R)	5.2 (P,R)	NA	NLV	NLV	ID	<10 U	–	<10 U	–	<10 U	–	–	–	–	–	–	–	–	–	–	–	–	–
Organics - PCBs (ug/l)																										
TOTAL PCBs	TPCB	0.5 (A,J,T)	0.5 (A,J,T)	0.2 (J,M,T)	44.7 (J,T)	45 (J,S,T)	45 (J,S,T)	ID	ND	–	–	–	ND	–	–	–	–	–	–	–	–	–	–	–	–	–
Organics - SVOCs (ug/l)																										
1,1'-BIPHENYL	92-52-4	NA	NA	NA	NA	NA	NA	NA	4.3 J	–	–	–	<5.0 U	–	–	–	–	–	–	–	–	–	–	–	–	–
2-METHYLNAPHTHALENE (SVOC)	91-57-6S	260	750	19	24,600	25,000 (S)	25,000 (S)	ID	3.9 J	–	–	–	<5.0 U	–	–	–	–	–	–	–	–	–	–	–	<5.8 U	–
ACENAPHTHENE	83-32-9	1,300	3,800	38	4,240	4,200 (S)	4,200 (S)	ID	4.5 J	–	–	–	<5.0 U	–	–	–	–	–	–	–	–	–	–	–	<5.8 U	–
DIBENZOFURAN	132-64-9	ID	ID	4	10,000	10,000 (S)	10,000 (S)	ID	6.9	[3]	–	–	<5.0 U	–	–	–	–	–	–	–	–	–	–	–	–	–
DI-N-BUTYLPHTHALATE	84-74-2	880	2,500	9.7	11,200	NLV	NLV	NA	<5.0 U	–	–	–	<5.0 U	–	–	–	–	–	–	–	–	–	–	–	–	–
FLUORENE	86-73-7	880	2,000 (S)	12	1,980	2,000 (S)	2,000 (S)	ID	5.4	–	–	–	<5.0 U	–	–	–	–	–	–	–	–	–	–	–	<5.8 U	–
NAPHTHALENE (SVOC)	91-20-3S	520	1,500	11	31,000	31,000 (S)	31,000 (S)	NA	2 J	–	–	–	<5.0 U	–	–	–	–	–	–	–	–	–	–	–	<5.8 U	–
PHENANTHRENE	85-01-8	52	150	2.0 (M)	1,000	1,000 (S)	1,000 (S)	ID	8.3	[3]	–	–	<5.0 U	–	–	–	–	–	–	–	–	–	–	–	<2.3 U	–
PYRENE	129-00-0	140 (S)	140 (S)	ID	135	140 (S)	140 (S)	ID	<5.0 U	–	–	–	<5.0 U	–	–	–	–	–	–	–	–	–	–	–	<5.8 U	–

TABLE 5-5
Sample Analytical Summary - Groundwater
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									
Station Name	CAS Number	[1] Residential Drinking Water Criteria	[2] Nonresidential Drinking Water Criteria	[3] Groundwater Surface Water Interface Criteria	[4] Water Solubility	[5] Residential Groundwater Volatilization to Indoor Air Inhalation Criteria	[6] Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria	[7] Flammability and Explosivity Screening Level
Organics - VOCs (ug/l)								
1,2,3-TRIMETHYLBENZENE	526-73-8	NA	NA	NA	NA	NA	NA	NA
1,2,4-TRIMETHYLBENZENE	95-63-6	63 (E,I)	63 (E,I)	17 (I)	55,890 (I)	56,000 (I,S)	56,000 (I,S)	56,000 (I,S)
1,3,5-TRIMETHYLBENZENE	108-67-8	72 (E)	72 (E)	45	61,150	61,000 (S)	61,000 (S)	ID
2-METHYLNAPHTHALENE (VOC)	91-57-6S	260	750	19	24,600	25,000 (S)	25,000 (S)	ID
2-PROPANONE (ACETONE)	67-64-1	730	2,100	1,700	1.00E+09	1.0E+9 (D,S)	1.0E+9 (D,S)	1.50E+07
CHLOROMETHANE	74-87-3	260 (I)	1,100 (I)	ID	6,340,000 (I)	8,600 (I)	45,000 (I)	36,000 (I)
ISOPROPYLBENZENE	98-82-8	800	2,300	28	56,000	56,000 (S)	56,000 (S)	29,000
NAPHTHALENE (VOC)	91-20-3V	520	1,500	11	31,000	31,000 (S)	31,000 (S)	NA
N-BUTYLBENZENE	104-51-8	80	230	ID	NA	ID	ID	ID
N-PROPYLBENZENE	103-65-1	80	230	ID	NA	ID	ID	ID
O-XYLENE	95-47-6	NA	NA	NA	NA	NA	NA	NA
SEC-BUTYLBENZENE	135-98-8	80	230	ID	NA	ID	ID	ID
XYLENE - TOTAL	1330-20-7	280 (E,I)	280 (E,I)	41 (I)	186,000 (I)	190,000 (I,S)	190,000 (I,S)	70,000 (I)
Organics Pesticides (ug/l)								
beta-BHC	319-85-7	0.88	3.6	ID	240	NLV	NLV	ID
delta-BHC	319-86-8	NA	NA	NA	NA	NA	NA	NA
gamma-BHC (Lindane)	58-89-9	0.2 (A)	0.2 (A)	0.03 (M); 0.026	6,800	ID	ID	ID
Field Measurements								
Conductivity (mS/cm)	NA	NA	NA	NA	NA	NA	NA	NA
DO (%)	NA	NA	NA	NA	NA	NA	NA	NA
pH	NA	NA	NA	NA	NA	NA	NA	NA
Temperature (°C)	NA	NA	NA	NA	NA	NA	NA	NA

Geographic Location	QUINCY RECLAMATION PLANT AREA						QUINCY STAMP SANDS AREA											
Station Name	TMW-03 (MDEQ 2013)		TMW-03 (MDEQ 2013)		TMW-04 (MDEQ 2013)		QMCM-GW32		QMCM-GW33		QMCM-GW34		QMCM-GW35		QMCM-GW36		SB/TMW-01 (UPEA 2016)	
Field Sample ID	E3PY1 & ME3PY1		ME3PY1D		E3PY2 & ME3PY2		QMCM-GW 32-10'-15'		QMCM-GW 33-10'-15'		QMCM-GW 34-8-13'		QMCM-GW 35-12'-17'		QMCM-GW 36 8-13		TMW-01	
Sample Date	09/11/13		09/11/13		09/11/13		05/20/17		05/20/17		05/20/17		05/20/17		05/20/17		11/30/16	
Sample Interval (bgs)	6.99 - 11.99 ft		6.99 - 11.99 ft		7.16 - 12.16 ft		10 - 15 ft		10 - 15 ft		8 - 13 ft		12 - 17 ft		8 - 13 ft		2 - 7 ft	
Sample Description	Clear but dark tint		Clear but dark tint		Clear but orange tint		Temporary Screen Interval: 10 ft - 15 ft		Temporary Screen Interval: 10 ft - 15 ft		Temporary Screen Interval: 8 ft - 13 ft		Temporary Screen Interval: 12 ft - 17 ft		Temporary Screen Interval: 8 ft - 13 ft		Stamp Sand	
	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Organics - VOCs (ug/l)																		
1,2,3-TRIMETHYLBENZENE	--	--	--	--	--	--	<1.0 U	--	<1.0 U	--	<1.0 U	--	<1.0 U	--	<1.0 U	--	--	--
1,2,4-TRIMETHYLBENZENE	--	--	--	--	--	--	<1.0 U	--	<1.0 U	--	<1.0 U	--	<1.0 U	--	<1.0 U	--	<1.0 U	--
1,3,5-TRIMETHYLBENZENE	--	--	--	--	--	--	<1.0 U	--	<1.0 U	--	<1.0 U	--	<1.0 U	--	<1.0 U	--	<1.0 U	--
2-METHYLNAPHTHALENE (VOC)	--	--	--	--	--	--	<5.0 U	--	<5.0 U	--	<5.0 U	--	<5.0 U	--	<5.0 U	--	<5.0 U	--
2-PROPANONE (ACETONE)	<20 U	--	--	--	<20 U	--	<20 UJ	--	<20 UJ	--	<20 UJ	--	<20 UJ	--	<20 UJ	--	--	--
CHLOROMETHANE	<5.0 U	--	--	--	<5.0 U	--	<5.0 U	--	<5.0 U	--	<5.0 U	--	<5.0 U	--	<5.0 U	--	<1.0 U	--
ISOPROPYLBENZENE	<5.0 U	--	--	--	<5.0 U	--	<1.0 U	--	<1.0 U	--	<1.0 U	--	<1.0 U	--	<1.0 U	--	<1.0 U	--
NAPHTHALENE (VOC)	--	--	--	--	--	--	<5.0 U	--	<5.0 U	--	<5.0 U	--	<5.0 U	--	<5.0 U	--	<5.0 U	--
N-BUTYLBENZENE	--	--	--	--	--	--	<1.0 U	--	<1.0 U	--	<1.0 U	--	<1.0 U	--	<1.0 U	--	--	--
N-PROPYLBENZENE	--	--	--	--	--	--	<1.0 U	--	<1.0 U	--	<1.0 U	--	<1.0 U	--	<1.0 U	--	<1.0 U	--
O-XYLENE	<5.0 U	--	--	--	<5.0 U	--	<1.0 U	--	<1.0 U	--	<1.0 U	--	<1.0 U	--	<1.0 U	--	<1.0 U	--
SEC-BUTYLBENZENE	--	--	--	--	--	--	<1.0 U	--	<1.0 U	--	<1.0 U	--	<1.0 U	--	<1.0 U	--	--	--
XYLENE - TOTAL	ND	--	--	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	<3.0 U	--
Organics Pesticides (ug/l)																		
beta-BHC	**0.11 J**	--	--	--	<0.05 U	--	--	--	--	--	--	--	--	--	--	--	<0.013 U	--
delta-BHC	**0.076 J**	--	--	--	<0.05 U	--	--	--	--	--	--	--	--	--	--	--	<0.013 U	--
gamma-BHC (Lindane)	**0.064 J**	[3]	--	--	<0.05 U	--	--	--	--	--	--	--	--	--	--	--	<0.013 U	--
Field Measurements																		
Conductivity (mS/cm)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**0.16**	--	--	--
DO (%)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**0.7**	--	--	--
pH	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**7.61**	--	--	--
Temperature (°C)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**7.4**	--	--	--

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

TABLE 5-5
Sample Analytical Summary - Groundwater
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY STAMP SANDS AREA															
Station Name	CAS Number	[1] Residential Drinking Water Criteria	[2] Nonresidential Drinking Water Criteria	[3] Groundwater Surface Water Interface Criteria	[4] Water Solubility	[5] Residential Groundwater Volatilization to Indoor Air Inhalation Criteria	[6] Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria	[7] Flammability and Explosivity Screening Level	SB/TMW-02 (UPEA 2016)		SB/TMW-03 (UPEA 2016)		SB/TMW-04 (UPEA 2016)		SB/TMW-05 (UPEA 2016)		SB/TMW-06 (UPEA 2016)		SB/TMW-07 (UPEA 2016)		SB/TMW-08 (UPEA 2016)		SB/TMW-09 (UPEA 2016)	
Field Sample ID									TMW-02		TMW-03		TMW-04		TMW-05		TMW-06		TMW-07		TMW-08		TMW-09	
Sample Date									12/01/16		11/30/16		11/30/16		11/30/16		11/30/16		12/01/16		12/01/16		12/01/16	
Sample Interval (bgs)									13 - 18 ft		5 - 10 ft		2 - 7 ft		2.5 - 7.5 ft		2 - 7 ft		3 - 8 ft		2.5 - 7.5 ft		13 - 18 ft	
Sample Description									Stamp Sand		Stamp Sand		Stamp Sand		Stamp Sand		Stamp Sand		Stamp Sand		Stamp Sand		Stamp Sand	
									Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Inorganics - Metals (ug/l)																								
ALUMINUM	7429-90-5	50 (V)	50 (V)	NA	NA	NLV	NLV	ID	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ARSENIC	7440-38-2	10 (A)	10 (A)	10	NA	NLV	NLV	ID	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–
BARIUM	7440-39-3	2,000 (A)	2,000 (A)	200 (G)	NA	NLV	NLV	ID	15	–	20	–	25	–	45	–	26	–	18	–	43	–	72	–
CADMIUM	7440-43-9	5.0 (A)	5.0 (A)	1.3 (G,X)	NA	NLV	NLV	ID	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–
CALCIUM	7440-70-2	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CHROMIUM	7440-47-3	100 (A,H)	100 (A,H)	40 (G,H,X)	NA	NLV	NLV	ID	<5.0 U	–	<5.0 U	–	11	–	<5.0 U	–	6	–	<5.0 U	–	14	–	68	[3]
COBALT	7440-48-4	40	100	100	NA	NLV	NLV	ID	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
COPPER	7440-50-8	1,000 (E)	1,000 (E)	4.7 (G)	NA	NLV	NLV	ID	39	[3]	170	[3]	350	[3]	210	[3]	260	[3]	150	[3]	400	[3]	3,000	[1,2,3]
IRON	7439-89-6	300 (E)	300 (E)	NA	NA	NLV	NLV	ID	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
LEAD	7439-92-1	4.0 (L)	4.0 (L)	11 (G,X)	NA	NLV	NLV	ID	<3.0 U	–	<3.0 U	–	<3.0 U	–	<3.0 U	–	<3.0 U	–	<3.0 U	–	<3.0 U	–	19	[1,2,3]
MAGNESIUM	7439-95-4	400,000	1,100,000	NA	NA	NLV	NLV	ID	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MANGANESE	7439-96-5	50 (E)	50 (E)	1,000 (G,X)	NA	NLV	NLV	ID	35	–	42	–	260	[1,2]	140	[1,2]	260	[1,2]	86	[1,2]	410	[1,2]	1,600	[1,2,3]
MERCURY	7439-97-6	2.0 (A)	2.0 (A)	0.0013	56	56 (S)	56 (S)	ID	<0.2 U	–	<0.2 U	–	<0.2 U	–	<0.2 U	–	<0.2 U	–	<0.2 U	–	<0.2 U	–	0.3	[3]
NICKEL	7440-02-0	100 (A)	100 (A)	28 (G)	NA	NLV	NLV	ID	<5.0 U	–	<5.0 U	–	15	–	<5.0 U	–	12	–	<5.0 U	–	21	–	75	[3]
POTASSIUM	7440-09-7	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SELENIUM	7782-49-2	50 (A)	50 (A)	5	NA	NLV	NLV	ID	25	[3]	15	[3]	6	[3]	<5.0 U	–	<5.0 U	–	21	[3]	<5.0 U	–	22	[3]
SILVER	7440-22-4	34	98	0.2 (M)	NA	NLV	NLV	ID	<0.2 U	–	<0.2 U	–	0.5	[3]	0.3	[3]	0.3	[3]	<0.2 U	–	0.6	[3]	7	[3]
SODIUM	7440-23-5	230, 000 (HH)	350,000	NA	NA	NLV	NLV	ID	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
VANADIUM	7440-62-2	4.5	62	27	NA	NLV	NLV	ID	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ZINC	7440-66-6	2,400	5,000 (E)	63 (G)	NA	NLV	NLV	ID	12	–	15	–	38	–	19	–	29	–	19	–	52	–	170	[3]
Inorganics - Cyanide (ug/l)																								
CYANIDE (P,R)	57-12-5	200 (A,P,R)	200 (A,P,R)	5.2 (P,R)	NA	NLV	NLV	ID	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Organics - PCBs (ug/l)																								
TOTAL PCBs	TPCB	0.5 (A,J,T)	0.5 (A,J,T)	0.2 (J,M,T)	44.7 (J,T)	45 (J,S,T)	45 (J,S,T)	ID	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Organics - SVOCs (ug/l)																								
1,1'-BIPHENYL	92-52-4	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2-METHYLNAPHTHALENE (SVOC)	91-57-6S	260	750	19	24,600	25,000 (S)	25,000 (S)	ID	<5.7 U	–	<6.3 U	–	<6.1 U	–	<5.7 U	–	<6.2 U	–	<5.7 U	–	<5.7 U	–	<6 U	–
ACENAPHTHENE	83-32-9	1,300	3,800	38	4,240	4,200 (S)	4,200 (S)	ID	<5.7 U	–	<6.3 U	–	<6.1 U	–	<5.7 U	–	<6.2 U	–	<5.7 U	–	<5.7 U	–	<6 U	–
DIBENZOFURAN	132-64-9	ID	ID	4	10,000	10,000 (S)	10,000 (S)	ID	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DI-N-BUTYLPHTHALATE	84-74-2	880	2,500	9.7	11,200	NLV	NLV	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
FLUORENE	86-73-7	880	2,000 (S)	12	1,980	2,000 (S)	2,000 (S)	ID	<5.7 U	–	<6.3 U	–	<6.1 U	–	<5.7 U	–	<6.2 U	–	<5.7 U	–	<5.7 U	–	<6 U	–
NAPHTHALENE (SVOC)	91-20-3S	520	1,500	11	31,000	31,000 (S)	31,000 (S)	NA	<5.7 U	–	<6.3 U	–	<6.1 U	–	<5.7 U	–	<6.2 U	–	<5.7 U	–	<5.7 U	–	<6 U	–
PHENANTHRENE	85-01-8	52	150	2.0 (M)	1,000	1,000 (S)	1,000 (S)	ID	<2.3 U	–	<2.5 U	–	<2.4 U	–	<2.3 U	–	<2.5 U	–	<2.3 U	–	<2.3 U	–	<2.4 U	–
PYRENE	129-00-0	140 (S)	140 (S)	ID	135	140 (S)	140 (S)	ID	<5.7 U	–	<6.3 U	–	<6.1 U	–	<5.7 U	–	<6.2 U	–	<5.7 U	–	<5.7 U	–	<6 U	–

TABLE 5-5
Sample Analytical Summary - Groundwater
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Geographic Location									QUINCY STAMP SANDS AREA															
Station Name	CAS Number	[1] Residential Drinking Water Criteria	[2] Nonresidential Drinking Water Criteria	[3] Groundwater Surface Water Interface Criteria	[4] Water Solubility	[5] Residential Groundwater Volatilization to Indoor Air Inhalation Criteria	[6] Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria	[7] Flammability and Explosivity Screening Level	SB/TMW-02 (UPEA 2016)		SB/TMW-03 (UPEA 2016)		SB/TMW-04 (UPEA 2016)		SB/TMW-05 (UPEA 2016)		SB/TMW-06 (UPEA 2016)		SB/TMW-07 (UPEA 2016)		SB/TMW-08 (UPEA 2016)		SB/TMW-09 (UPEA 2016)	
Field Sample ID									TMW-02		TMW-03		TMW-04		TMW-05		TMW-06		TMW-07		TMW-08		TMW-09	
Sample Date									12/01/16		11/30/16		11/30/16		11/30/16		11/30/16		12/01/16		12/01/16		12/01/16	
Sample Interval (bgs)									13 - 18 ft		5 - 10 ft		2 - 7 ft		2.5 - 7.5 ft		2 - 7 ft		3 - 8 ft		2.5 - 7.5 ft		13 - 18 ft	
Sample Description									Stamp Sand		Stamp Sand		Stamp Sand		Stamp Sand		Stamp Sand		Stamp Sand		Stamp Sand		Stamp Sand	
									Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Organics - VOCs (ug/l)																								
1,2,3-TRIMETHYLBENZENE	526-73-8	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1,2,4-TRIMETHYLBENZENE	95-63-6	63 (E,I)	63 (E,I)	17 (I)	55,890 (I)	56,000 (I,S)	56,000 (I,S)	56,000 (I,S)	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–
1,3,5-TRIMETHYLBENZENE	108-67-8	72 (E)	72 (E)	45	61,150	61,000 (S)	61,000 (S)	ID	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–
2-METHYLNAPHTHALENE (VOC)	91-57-6S	260	750	19	24,600	25,000 (S)	25,000 (S)	ID	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–
2-PROPANONE (ACETONE)	67-64-1	730	2,100	1,700	1.00E+09	1.0E+9 (D,S)	1.0E+9 (D,S)	1.50E+07	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CHLOROMETHANE	74-87-3	260 (I)	1,100 (I)	ID	6,340,000 (I)	8,600 (I)	45,000 (I)	36,000 (I)	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–
ISOPROPYLBENZENE	98-82-8	800	2,300	28	56,000	56,000 (S)	56,000 (S)	29,000	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–
NAPHTHALENE (VOC)	91-20-3V	520	1,500	11	31,000	31,000 (S)	31,000 (S)	NA	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–	<5.0 U	–
N-BUTYLBENZENE	104-51-8	80	230	ID	NA	ID	ID	ID	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
N-PROPYLBENZENE	103-65-1	80	230	ID	NA	ID	ID	ID	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–
O-XYLENE	95-47-6	NA	NA	NA	NA	NA	NA	NA	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–	<1.0 U	–
SEC-BUTYLBENZENE	135-98-8	80	230	ID	NA	ID	ID	ID	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
XYLENE - TOTAL	1330-20-7	280 (E,I)	280 (E,I)	41 (I)	186,000 (I)	190,000 (I,S)	190,000 (I,S)	70,000 (I)	<3.0 U	–	<3.0 U	–	<3.0 U	–	<3.0 U	–	<3.0 U	–	<3.0 U	–	<3.0 U	–	<3.0 U	–
Organics Pesticides (ug/l)																								
beta-BHC	319-85-7	0.88	3.6	ID	240	NLV	NLV	ID	<0.012 U	–	<0.012 U	–	<0.012 U	–	<0.012 U	–	<0.013 U	–	<0.012 U	–	<0.013 U	–	<0.013 U	–
delta-BHC	319-86-8	NA	NA	NA	NA	NA	NA	NA	<0.012 U	–	<0.012 U	–	<0.012 U	–	<0.012 U	–	<0.013 U	–	<0.012 U	–	<0.013 U	–	<0.013 U	–
gamma-BHC (Lindane)	58-89-9	0.2 (A)	0.2 (A)	0.03 (M); 0.026	6,800	ID	ID	ID	<0.012 U	–	<0.012 U	–	<0.012 U	–	<0.012 U	–	<0.013 U	–	<0.012 U	–	<0.013 U	–	<0.013 U	–
Field Measurements																								
Conductivity (mS/cm)	NA	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DO (%)	NA	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
pH	NA	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Temperature (°C)	NA	NA	NA	NA	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

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

TABLE 5-5
Sample Analytical Summary - Groundwater
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Groundwater Table Footnotes:

- MDEQ 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.
- 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. ND indicates that one or more analyte of that group was tested and not detected and a – indicates not analyzed.
- **Bold** values are concentrations detected above the laboratory reporting limit.
- **Bold/Shaded** cells indicate analyte concentration exceeded applicable criteria. MDEQ Part 201 criteria exceeded is indicated by the footnote in [brackets] following the result value and defined below:
  - [1] - Residential Drinking Water Criteria
  - [2] - Nonresidential Drinking Water Criteria
  - [3] - Groundwater Surface Water Interface Criteria
  - [4] - Water Solubility
  - [5] - Residential Groundwater Volatilization to Indoor Air Inhalation Criteria
  - [6] - Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria
  - [7] - Flammability and Explosivity Screening Level
  - Evaluation based on MDEQ Criteria at time of Project completion.

-- = Not analyzed/Not reported
bgs = Below ground surface
ft = Feet
PCBs = Polychlorinated biphenyls
SVOC = Semi-volatile organic compound
ug/l = Micrograms per liter
VOC = Volatile organic compound
°C = Degrees Celsius
mS/cm = MilliSiemens per centimeter
% = Percentage

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.
(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 Environmental Quality (DEQ) 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 CaCO3/L, use 400 mg CaCO3/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 Environmental Quality (DEQ) internet web site. A hardness value of 47.5 CaCO3/L and pH of 7, derived from the MDEQ 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 the DEQ, 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 DEQ, 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 Environmental Quality (DEQ) 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.

(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.

(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 DEQ, 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 DEQ, RRD, 525 West Allegan Street, Lansing, Michigan 48933, at cost.

(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 DEQ, 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 DEQ, 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.

(V) = Criterion is the aesthetic drinking water value as required by Section 20120(a)(5) of the NREPA. Concentrations up to 200 ug/L may be acceptable, and still allow for drinking water use, as part of a site-specific cleanup under Section 20120a(2) and 20120b of the NREPA.

(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.)

Laboratory Footnotes:

J = The result is an estimated quantity
J+ = The result is an estimated quantity, but the result may be biased high
J- = The result is an estimated quantity, but the result may be biased low
ND = Not Detected
U = Analyte analyzed for but not detected above the reported sample reporting limit.

TABLE 5-6
Sample Analytical Summary - Sediment
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Station Name	CAS Number	[1] EPA Region 5 Ecological Screening Level (ESL)	[2] Threshold Effect Concentration (TEC)	[3] Probable Effect Concentration (PEC)	QMCM-SD01				QMCM-SD02				QMCM-SD03				QMCM-SD04				QMCM-SD05			
Sample ID					QMCM-SD01 0-2.9'		QMCM-SD01 2.9-4.5'		QMCM-SD02 0-1.4'		QMCM-SD02 1.4-2.25'		QMCM-SD03 0-3'		QMCM-SD03 3-3.9'		QMCM-SD04 0-1'		QMCM-SD04 1-1.9'		QMCM-SD05 0-1.4'		QMCM-SD05 1.4-2.75'	
Sample Depth (bgs)					0 - 2.9 ft		2.9 - 4.5 ft		0 - 1.4 ft		1.4 - 2.25 ft		0 - 3 ft		3 - 3.9 ft		0 - 1 ft		1 - 1.9 ft		0 - 1.4 ft		1.4 - 2.75 ft	
Sample Date					06/08/17		06/08/17		06/08/17		06/08/17		06/08/17		06/08/17		06/09/17		06/09/17		06/09/17		06/09/17	
Sample Description					SILTY CLAY, dark brown, loose, wet to SILTY CLAY, trace sand, darkbrown, noncohesive, non-plastic, wet		SILTY CLAY, trace sand, dark brown, noncohesive, high plasticity, wet to SAND, medium grain, reddish brown		SILTY CLAY, dark brown, trace organics, soft, wet to SILTY CLAY, dark brown, trace organics, firm, wet		SILTY SAND, fine grain, dark brown, firm		SILTY CLAY, dark brown, loose, wet to SANDY SILT, dark brown, soft, wet		SILT, dark brown - red mottled, cohesive, high plasticity to SAND medium to coarse grain, brown, stiff, wet		SILT, dark brown - black, saturated, loose, oily sheen to SILTY SAND, fine grain, brown, firm, moist, oily sheen		SILTY SAND, medium grain, brown, trace copper colored flecks, oily sheen		SILT, dark brown - black, saturated, loose to SAND, brown, fine grain, firm, moist		SAND, brown, fine grain, firm, moist	
					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	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ANTIMONY	7440-36-0	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ARSENIC	7440-38-2	9.79	9.79	33.0	**1.3**	–	–	–	**1.4**	–	–	–	<0.5 U	–	–	–	**1.2**	–	–	–	**1.8**	–	–	–
BARIUM	7440-39-3	NA	NA	NA	**15**	–	–	–	**14**	–	–	–	**14**	–	–	–	**24**	–	–	–	**32**	–	–	–
BERYLLIUM	7440-41-7	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CADMIUM	7440-43-9	0.99	0.99	4.98	**0.3**	–	–	–	**0.3**	–	–	–	**0.2**	–	–	–	**0.3**	–	–	–	**0.4**	–	–	–
CALCIUM	7440-70-2	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CHROMIUM	7440-47-3	43.4	43.4	111	**27**	–	–	–	**29**	–	–	–	**22**	–	–	–	**23**	–	–	–	**22**	–	–	–
COBALT	7440-48-4	50	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
COPPER	7440-50-8	31.6	31.6	149	**1,600**	**[1,2,3]**	–	–	**2,000**	**[1,2,3]**	–	–	**1,700**	**[1,2,3]**	–	–	**740**	**[1,2,3]**	–	–	**1,400**	**[1,2,3]**	–	–
IRON	7439-89-6	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
LEAD	7439-92-1	35.8	35.8	128	**9.2**	–	–	–	**8.5**	–	–	–	**6.2**	–	–	–	**8.1**	–	–	–	**20**	–	–	–
MAGNESIUM	7439-95-4	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MANGANESE	7439-96-5	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MERCURY	7439-97-6	0.174	0.18	1.06	**0.4**	**[1,2]**	–	–	**0.7**	**[1,2]**	–	–	**0.4**	**[1,2]**	–	–	**0.1**	–	–	–	**0.5**	**[1,2]**	–	–
NICKEL	7440-02-0	22.7	22.7	48.6	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
POTASSIUM	7440-23-5	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SILVER	7440-22-4	0.5	NA	NA	**3.5**	**[1]**	–	–	**4.0**	**[1]**	–	–	**4.2**	**[1]**	–	–	**1.7**	**[1]**	–	–	**3.1**	**[1]**	–	–
SODIUM	7440-23-5	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
VANADIUM	7440-62-2	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ZINC	7440-66-6	121	121	459	**77**	–	–	–	**83**	–	–	–	**82**	–	–	–	**74**	–	–	–	**110**	–	–	–
Inorganics - Cyanide (mg/kg)																								
CYANIDE	57-12-5	0.0001	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Organics - PCBs (ug/kg)																								
TOTAL PCBs	TPCB	59.8	59.8	676	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–
Organics - SVOCs (ug/kg)																								
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	182	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DI-N-BUTYLPHTHALATE	84-74-2	1114	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
FLUORANTHENE	206-44-0	423	423	2,230	<750 U	–	<690 U	–	<720 U	–	<250 U	–	<700 U	–	<270 U	–	<270 U	–	<240 U	–	<750 U	–	<260 U	–
PENTACHLOROPHENOL	87-86-5	23,000	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PHENANTHRENE	85-01-8	204	204	1,170	<750 U	–	<690 U	–	<720 U	–	<250 U	–	<700 U	–	<270 U	–	<270 U	–	<240 U	–	<750 U	–	<260 U	–
PYRENE	129-00-0	195	195	1,520	<750 UJ	–	<690 UJ	–	<720 UJ	–	<250 UJ	–	<700 UJ	–	<270 UJ	–	<270 UJ	–	<240 UJ	–	<750 U	–	<260 U	–
Organics - VOCs (ug/kg)																								
					–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Organics - Pesticides																								
					–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

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

TABLE 5-6
Sample Analytical Summary - Sediment
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Station Name	CAS Number	[1] EPA Region 5 Ecological Screening Level (ESL)	[2] Threshold Effect Concentration (TEC)	[3] Probable Effect Concentration (PEC)	QMCM-SD06				QMCM-SD07				QMCM-SD08						QMCM-SD09			
Sample ID					QMCM-SD06 0-1.4'		QMCM-SD06 1.4-2.75'		QMCM-SD07 0-2.3'		QMCM-SD07 2.3-4.8'		QMCM-SD08 0-1.25'		QMCM-SD08 0-1.25' Duplicate		QMCM-SD08 1.25-2.8'		QMCM-SD09 0-2.75'		QMCM-SD09 2.75-4.9'	
Sample Depth (bgs)					0 - 1.4 ft		1.4 - 2.75 ft		0 - 2.3 ft		2.3 - 4.8 ft		0 - 1.25 ft		0 - 1.25 ft		1.25 - 2.8 ft		0 - 2.75 ft		2.75 - 4.9 ft	
Sample Date					06/09/17		06/09/17		06/09/17		06/09/17		06/09/17		06/09/17		06/09/17		06/09/17		06/09/17	
Sample Description					SILT, dark brown - black, loose, wet to SILTY SAND, fine grain, brown, firm, moist		SILTY SAND, fine grain, brown, firm, moist		SANDY SILT, dark brown, organics, soft, wet to GRAVELLY SAND, medium to coarse grain, dark brown - red, poorly sorted, wet to CLAY red brown mottled, cohesive, soft to SAND, fine grain, brown, well sorted, moist		CLAY, reddish brown, noncohesive, non-plastic, loose, saturated to SAND, fine grain, well sorted, reddish brown		SILTY SAND, fine grain, well sorted, dark brown, moist to GRAVELLY SAND, coarse grain, reddish brown, stiff to SILTY SAND, fine grain, well sorted, brown, stiff, wet		Field Duplicate		SILTY SAND, fine grain, well sorted, brown, stiff, wet		SILTY CLAY, dark brown - black, loose, saturated to SAND, fine grain, well sorted, brown, stiff, wet		SILTY CLAY, red brown mottled, noncohesive, non-plastic, loose, wet, firm at bottom of core	
					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	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ANTIMONY	7440-36-0	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ARSENIC	7440-38-2	9.79	9.79	33.0	<0.5 U	–	–	–	**0.5**	–	–	–	**1.1**	–	**0.9**	–	–	–	**1.6**	–	–	–
BARIUM	7440-39-3	NA	NA	NA	**14**	–	–	–	**11**	–	–	–	**11 J**	–	**11**	–	–	–	**8.5**	–	–	–
BERYLLIUM	7440-41-7	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CADMIUM	7440-43-9	0.99	0.99	4.98	**0.3**	–	–	–	**0.3**	–	–	–	**0.3**	–	**0.3**	–	–	–	**0.2**	–	–	–
CALCIUM	7440-70-2	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CHROMIUM	7440-47-3	43.4	43.4	111	**22**	–	–	–	**22**	–	–	–	**24**	–	**25**	–	–	–	**19**	–	–	–
COBALT	7440-48-4	50	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
COPPER	7440-50-8	31.6	31.6	149	**700**	[1,2,3]	–	–	**8,300**	[1,2,3]	–	–	**2,200**	[1,2,3]	**2,800**	[1,2,3]	–	–	**4,200**	[1,2,3]	–	–
IRON	7439-89-6	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
LEAD	7439-92-1	35.8	35.8	128	**4.8**	–	–	–	**6.9**	–	–	–	**5.4**	–	**5.3**	–	–	–	**5.3**	–	–	–
MAGNESIUM	7439-95-4	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MANGANESE	7439-96-5	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MERCURY	7439-97-6	0.174	0.18	1.06	**0.2**	[1,2]	–	–	**0.3**	[1,2]	–	–	**0.3**	[1,2]	**0.5**	[1,2]	–	–	**0.3**	[1,2]	–	–
NICKEL	7440-02-0	22.7	22.7	48.6	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
POTASSIUM	7440-23-5	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SILVER	7440-22-4	0.5	NA	NA	**2.1**	[1]	–	–	**8.4**	[1]	–	–	**4.9**	[1]	**5.5**	[1]	–	–	**7.0**	[1]	–	–
SODIUM	7440-23-5	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
VANADIUM	7440-62-2	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ZINC	7440-66-6	121	121	459	**62**	–	–	–	**80**	–	–	–	**70 J**	–	**75**	–	–	–	**69**	–	–	–
Inorganics - Cyanide (mg/kg)																						
CYANIDE	57-12-5	0.0001	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Organics - PCBs (ug/kg)																						
TOTAL PCBs	TPCB	59.8	59.8	676	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–
Organics - SVOCs (ug/kg)																						
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	182	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DI-N-BUTYLPHTHALATE	84-74-2	1114	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
FLUORANTHENE	206-44-0	423	423	2,230	<270 U	–	<260 U	–	<260 U	–	<700 U	–	<620 U	–	<250 U	–	<260 U	–	<260 U	–	<300 U	–
PENTACHLOROPHENOL	87-86-5	23,000	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PHENANTHRENE	85-01-8	204	204	1,170	<270 U	–	<260 U	–	<260 U	–	<700 U	–	<620 U	–	<250 U	–	<260 U	–	<260 U	–	<300 U	–
PYRENE	129-00-0	195	195	1,520	<270 U	–	<260 U	–	<260 U	–	<700 U	–	<620 U	–	<250 U	–	<260 U	–	<260 U	–	<300 U	–
Organics - VOCs (ug/kg)																						
					–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Organics - Pesticides																						
					–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

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

TABLE 5-6
Sample Analytical Summary - Sediment
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Station Name	CAS Number	[1] EPA Region 5 Ecological Screening Level (ESL)	[2] Threshold Effect Concentration (TEC)	[3] Probable Effect Concentration (PEC)	QMCM-SD10				QMCM-SD12						QMCM-SD13				QMCM-SD14		QMCM-SD15			
Sample ID					QMCM-SD10 0-.5'		QMCM-SD10 .5-1'		QMCM-SD12 0-1'		QMCM-SD12 1-2.3'		QMCM-SD12 1-2.3' FD		QMCM-SD13 0-3'		QMCM-SD13 3-4.2'		QMCM-SD14 0-0.3'		QMCM-SD15 0-1.1'		QMCM-SD15 1.1-2.9'	
Sample Depth (bgs)					0 - 0.5 ft		0.5 - 1 ft		0 - 1 ft		1 - 2.3 ft		1 - 2.3 ft		0 - 3 ft		3 - 4.2 ft		0 - 0.3 ft		0 - 1.1 ft		1.1 - 2.9 ft	
Sample Date					06/09/17		06/09/17		06/11/17		06/11/17		06/11/17		06/11/17		06/11/17		06/11/17		06/11/17		06/11/17	
Sample Description					SANDY CLAY, trace organics, brown, loose, wet		SANDY CLAY, trace organics, brown, loose, wet		SILTY CLAY, reddish brown, loose, wet		SILTY SAND, fine grain, well sorted, reddish brown, firm, wet		Field Duplicate		SILTY CLAY, reddish brown, loose, soft, wet		SILTY SAND, fine grain, well sorted, reddish brown, firm, wet		GRAVELLY SAND, coarse grain, reddish brown, wet		SANDY GRAVEL, coarse grain, reddish brown, wet		SILTY SAND, fine grain, well sorted, reddish brown, wet to GRAVELLY SAND, poorly sorted, reddish brown, wet to SILTY SAND, fine grain, well sorted, reddish brown, wet to GRAVELLY SAND, poorly sorted, reddish brown, wet to SILTY SAND, fine grain, well sorted	
					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	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ANTIMONY	7440-36-0	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ARSENIC	7440-38-2	9.79	9.79	33.0	5.1	–	–	–	2.5	–	–	–	–	–	3.5	–	–	–	0.7	–	<0.5 U	–	–	–
BARIUM	7440-39-3	NA	NA	NA	18	–	–	–	16	–	–	–	–	–	20	–	–	–	8.8	–	7.3	–	–	–
BERYLLIUM	7440-41-7	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CADMIUM	7440-43-9	0.99	0.99	4.98	0.2	–	–	–	0.3	–	–	–	–	–	0.2	–	–	–	0.3	–	0.3	–	–	–
CALCIUM	7440-70-2	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CHROMIUM	7440-47-3	43.4	43.4	111	22	–	–	–	46	[1,2]	–	–	–	–	64	[1,2]	–	–	41	–	32	–	–	–
COBALT	7440-48-4	50	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
COPPER	7440-50-8	31.6	31.6	149	310	[1,2,3]	–	–	2,600	[1,2,3]	–	–	–	–	2,500	[1,2,3]	–	–	2,900	[1,2,3]	2,700	[1,2,3]	–	–
IRON	7439-89-6	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
LEAD	7439-92-1	35.8	35.8	128	5.4	–	–	–	6.4	–	–	–	–	–	8.9	–	–	–	4.6	–	4.4	–	–	–
MAGNESIUM	7439-95-4	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MANGANESE	7439-96-5	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MERCURY	7439-97-6	0.174	0.18	1.06	0.2	[1,2]	–	–	0.7	[1,2]	–	–	–	–	0.8	[1,2]	–	–	0.1	–	0.3	[1,2]	–	–
NICKEL	7440-02-0	22.7	22.7	48.6	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
POTASSIUM	7440-23-5	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SILVER	7440-22-4	0.5	NA	NA	0.8	[1]	–	–	3.2	[1]	–	–	–	–	3.0	[1]	–	–	2.0	[1]	3.1	[1]	–	–
SODIUM	7440-23-5	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
VANADIUM	7440-62-2	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ZINC	7440-66-6	121	121	459	56	–	–	–	120	–	–	–	–	–	170	[1,2]	–	–	82	–	89	–	–	–
Inorganics - Cyanide (mg/kg)																								
CYANIDE	57-12-5	0.0001	NA	NA	<0.17 U	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Organics - PCBs (ug/kg)																								
TOTAL PCBs	TPCB	59.8	59.8	676	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–
Organics - SVOCs (ug/kg)																								
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	182	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DI-N-BUTYLPHTHALATE	84-74-2	1114	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
FLUORANTHENE	206-44-0	423	423	2,230	<340 U	–	<250 U	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PENTACHLOROPHENOL	87-86-5	23,000	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PHENANTHRENE	85-01-8	204	204	1,170	<340 U	–	<250 U	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PYRENE	129-00-0	195	195	1,520	<340 U	–	<250 U	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Organics - VOCs (ug/kg)																								
					–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Organics - Pesticides																								
					–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

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

TABLE 5-6
Sample Analytical Summary - Sediment
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Station Name	CAS Number	[1] EPA Region 5 Ecological Screening Level (ESL)	[2] Threshold Effect Concentration (TEC)	[3] Probable Effect Concentration (PEC)	QMCM-SD17						QMCM-SD19				QMCM-SD20				QMCM-SD23			
Sample ID					QMCM-SD17 0-2'		QMCM-SD17 0-2' dup		QMCM-SD17 2'-4.2'		QMCM-SD19 0-2.2'		QMCM-SD19 2.2'-4.3'		QMCM-SD20 0-2.1'		QMCM-SD20 2.1'-4.25'		QMCM-SD23 0-2'		QMCM-SD23 2'-4.25'	
Sample Depth (bgs)					0 - 2 ft		0 - 2 ft		2 - 4.2 ft		0 - 2.2 ft		2.2 - 4.3 ft		0 - 2.1 ft		2.1 - 4.25 ft		0 - 2 ft		2 - 4.25 ft	
Sample Date					06/13/17		06/13/17		06/13/17		06/13/17		06/13/17		06/13/17		06/13/17		06/12/17		06/12/17	
Sample Description					SAND and CLAY, brown, some organics to CLAY, reddish brown, soft, wet to SAND, brown, medium grain, well sorted, with thin clay lenses		Field Duplicate		SAND and CLAY, alternating layers of sand and clay, 1-4in thick		SAND, brown, medium grain, well sorted to CLAY, reddish brown, loose, wet to SAND, brown medium grain, well sorted to CLAY, reddish brown, soft, wet		CLAY, reddish brown, soft, wet to SAND, brown, medium grain, well sorted to CLAY, reddish brown, soft, wet to SAND, brown, medium grain, well sorted to CLAY, reddish brown, soft, wet		CLAY, brown, soft, loose, wet to CLAY WITH COAL, reddish brown, gravel sized coal pieces throughout		CLAY WITH COAL, reddish brown, gravel sized coal pieces throughout		SILTY CLAY, reddish brown, loose, soft, wet		COAL, gravel sixed pieces of coal to SILTY CLAY, reddish, trace coal pieces, and some cardboard like debris to COAL, large pieces of coal in a fine matrix	
					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	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ANTIMONY	7440-36-0	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ARSENIC	7440-38-2	9.79	9.79	33.0	11	[1,2]	13	[1,2]	–	–	13	[1,2]	–	–	11	[1,2]	–	–	18	[1,2]	–	–
BARIUM	7440-39-3	NA	NA	NA	49	–	52	–	–	–	27	–	–	–	35	–	–	–	38	–	–	–
BERYLLIUM	7440-41-7	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CADMIUM	7440-43-9	0.99	0.99	4.98	<0.2 U	–	0.2	–	–	–	<0.2 U	–	–	–	0.2	–	–	–	0.2	–	–	–
CALCIUM	7440-70-2	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CHROMIUM	7440-47-3	43.4	43.4	111	44 J	[1,2]	52	[1,2]	–	–	47	[1,2]	–	–	54	[1,2]	–	–	63	[1,2]	–	–
COBALT	7440-48-4	50	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
COPPER	7440-50-8	31.6	31.6	149	1,200	[1,2,3]	1,300	[1,2,3]	–	–	1,600	[1,2,3]	–	–	1,200	[1,2,3]	–	–	1,700	[1,2,3]	–	–
IRON	7439-89-6	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
LEAD	7439-92-1	35.8	35.8	128	12	–	12	–	–	–	7.8	–	–	–	16	–	–	–	12	–	–	–
MAGNESIUM	7439-95-4	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MANGANESE	7439-96-5	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MERCURY	7439-97-6	0.174	0.18	1.06	0.2	[1,2]	0.2	[1,2]	–	–	0.3	[1,2]	–	–	0.8	[1,2]	–	–	0.4	[1,2]	–	–
NICKEL	7440-02-0	22.7	22.7	48.6	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
POTASSIUM	7440-23-5	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SILVER	7440-22-4	0.5	NA	NA	2.1	[1]	2.0	[1]	–	–	2.5	[1]	–	–	1.9	[1]	–	–	2.8	[1]	–	–
SODIUM	7440-23-5	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
VANADIUM	7440-62-2	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ZINC	7440-66-6	121	121	459	140	[1,2]	160	[1,2]	–	–	150	[1,2]	–	–	150	[1,2]	–	–	200	[1,2]	–	–
Inorganics - Cyanide (mg/kg)																						
CYANIDE	57-12-5	0.0001	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Organics - PCBs (ug/kg)																						
TOTAL PCBs	TPCB	59.8	59.8	676	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	–	–	–	–	–	–
Organics - SVOCs (ug/kg)																						
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	182	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DI-N-BUTYLPHTHALATE	84-74-2	1114	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
FLUORANTHENE	206-44-0	423	423	2,230	<870 U	–	<890 U	–	–	–	1,200	[1,2]	–	–	<890 U	–	–	–	<920 U	–	–	–
PENTACHLOROPHENOL	87-86-5	23,000	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PHENANTHRENE	85-01-8	204	204	1,170	<870 U	–	<890 U	–	–	–	1,100	[1,2]	–	–	<890 U	–	–	–	<920 U	–	–	–
PYRENE	129-00-0	195	195	1,520	<870 U	–	<890 U	–	–	–	1,000	[1,2]	–	–	<890 U	–	–	–	<920 U	–	–	–
Organics - VOCs (ug/kg)																						
					–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Organics - Pesticides																						
					–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

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

TABLE 5-6
Sample Analytical Summary - Sediment
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Station Name	CAS Number	[1] EPA Region 5 Ecological Screening Level (ESL)	[2] Threshold Effect Concentration (TEC)	[3] Probable Effect Concentration (PEC)	QMCM-SD26				QMCM-SD28				QMCM-SD31				QMCM-SD33				QMCM-SD34			
Sample ID					QMCM-SD26-0-2.5'		QMCM-SD26-2.5'-5'		QMCM-SD28 0-2'		QMCM-SD28-2'-4'		QMCM-SD31-0-2.8'		QMCM-SD31-2.8'-5.6'		QMCM-SD33 0-2.5'		QMCM-SD33 2.5-5.1'		QMCM-SD34 0-0.8'		QMCM-SD34 0.8-2.5'	
Sample Depth (bgs)					0 - 2.5 ft		2.5 - 5 ft		0 - 2 ft		2 - 4 ft		0 - 2.8 ft		2.8 - 5.6 ft		0 - 2.5 ft		2.5 - 5.1 ft		0 - 0.8 ft		0.8 - 2.5 ft	
Sample Date					06/13/17		06/13/17		06/12/17		06/12/17		06/13/17		06/13/17		06/12/17		06/12/17		06/12/17		06/12/17	
Sample Description					CLAY, reddish brown, soft, loose, wet, coal and rock (slate) at 2ft, coal pieces at 4ft		CLAY, reddish brown, soft, loose, wet, coal and rock (slate) at 2ft, coal pieces at 4ft		SILTY CLAY, reddish brown, soft, loose, wet		GRAVELLY SAND, reddish brown, coarse grain, with fines, gravel sized coal pieces to SILTY CLAY, reddish brown, wet, loose, with large coal pieces at bottom		CLAY, brown, loose, soft, wet to CLAY, reddish brown, loose, wet, small sand seam <1in at 2.5ft, coal at 5.6ft		CLAY, brown, loose, soft, wet to CLAY, reddish brown, loose, wet, small sand seam <1in at 2.5ft, coal at 5.6ft		SILTY CLAY, reddish brown, soft, loose, wet to GRAVELLY SAND, reddish brown, coarse grain, poorly sorted		SILTY CLAY, reddish brown, seam of black friable gravel sized slag at 3.25ft to SILTY SAND, brown, fine grain, well sorted, wet		SILTY CLAY, reddish brown, loose, soft, saturated to GRAVELLY SAND, reddish brown, coarse grain, poorly sorted, trace fines		CLAY, reddish brown, loose, soft, wet, wood debris at 1.75ft to GRAVELLY SAND, reddish brown, coarse grain, poorly sorted, wet	
					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	NA	NA	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
ANTIMONY	7440-36-0	NA	NA	NA	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
ARSENIC	7440-38-2	9.79	9.79	33.0	13	[1,2]	—	—	13	[1,2]	—	—	11	[1,2]	—	—	15	[1,2]	—	—	5.7	—	—	—
BARIUM	7440-39-3	NA	NA	NA	53	—	—	—	67	—	—	—	47	—	—	—	41	—	—	—	16	—	—	—
BERYLLIUM	7440-41-7	NA	NA	NA	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CADMIUM	7440-43-9	0.99	0.99	4.98	0.2	—	—	—	<0.2 U	—	—	—	0.2	—	—	—	0.2	—	—	—	0.2	—	—	—
CALCIUM	7440-70-2	NA	NA	NA	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CHROMIUM	7440-47-3	43.4	43.4	111	64	[1,2]	—	—	58	[1,2]	—	—	54	[1,2]	—	—	64	[1,2]	—	—	42	—	—	—
COBALT	7440-48-4	50	NA	NA	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
COPPER	7440-50-8	31.6	31.6	149	1,700	[1,2,3]	—	—	1,800	[1,2,3]	—	—	1,500	[1,2,3]	—	—	1,600	[1,2,3]	—	—	1,900	[1,2,3]	—	—
IRON	7439-89-6	NA	NA	NA	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
LEAD	7439-92-1	35.8	35.8	128	15	—	—	—	15	—	—	—	15	—	—	—	15	—	—	—	10	—	—	—
MAGNESIUM	7439-95-4	NA	NA	NA	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MANGANESE	7439-96-5	NA	NA	NA	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MERCURY	7439-97-6	0.174	0.18	1.06	0.4	[1,2]	—	—	0.5	[1,2]	—	—	0.6	[1,2]	—	—	0.6	[1,2]	—	—	0.2	[1,2]	—	—
NICKEL	7440-02-0	22.7	22.7	48.6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
POTASSIUM	7440-23-5	NA	NA	NA	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
SILVER	7440-22-4	0.5	NA	NA	2.7	[1]	—	—	3.2	[1]	—	—	2.3	[1]	—	—	2.4	[1]	—	—	3.5	[1]	—	—
SODIUM	7440-23-5	NA	NA	NA	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
VANADIUM	7440-62-2	NA	NA	NA	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
ZINC	7440-66-6	121	121	459	210	[1,2]	—	—	180	[1,2]	—	—	180	[1,2]	—	—	160	[1,2]	—	—	120	—	—	—
Inorganics - Cyanide (mg/kg)																								
CYANIDE	57-12-5	0.0001	NA	NA	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Organics - PCBs (ug/kg)																								
TOTAL PCBs	TPCB	59.8	59.8	676	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Organics - SVOCs (ug/kg)																								
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	182	NA	NA	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
DI-N-BUTYLPHTHALATE	84-74-2	1114	NA	NA	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
FLUORANTHENE	206-44-0	423	423	2,230	<390 U	—	—	—	<940 U	—	—	—	<350 U	—	—	—	<930 U	—	—	—	—	—	—	—
PENTACHLOROPHENOL	87-86-5	23,000	NA	NA	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
PHENANTHRENE	85-01-8	204	204	1,170	<390 U	—	—	—	<940 U	—	—	—	400	[1,2]	—	—	1,200	[1,2,3]	—	—	—	—	—	—
PYRENE	129-00-0	195	195	1,520	<390 U	—	—	—	<940 U	—	—	—	<350 U	—	—	—	<930 U	—	—	—	—	—	—	—
Organics - VOCs (ug/kg)																								
					—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Organics - Pesticides																								
					—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

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

TABLE 5-6
Sample Analytical Summary - Sediment
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Station Name	CAS Number	[1] EPA Region 5 Ecological Screening Level (ESL)	[2] Threshold Effect Concentration (TEC)	[3] Probable Effect Concentration (PEC)	QMCM-SD35				QMCM-SD36						QMCM-SD38		QMCM-SD39				QMCM-SD40		QMCM-SD41	
Sample ID					QMCM-SD35 0-0.75'		QMCM-SD35 0.75-1.5'		QMCM-SD36-0-1.3'		QMCM-SD36-0-1.3' FD		QMCM-SD36-1.3-1.7'		QMCM-SD38 0-0.5'		QMCM-SD39 0-1.6'		QMCM-SD39 1.6-3.75'		QMCM-SD40-0-0.6'		QMCM-SD41-0-0.3'	
Sample Depth (bgs)					0 - 0.75 ft		0.75 - 1.5 ft		0 - 1.3 ft		0 - 1.3 ft		1.3 - 1.7 ft		0 - 0.5 ft		0 - 1.6 ft		1.6 - 3.75 ft		0 - 0.6 ft		0 - 0.3 ft	
Sample Date					06/12/17		06/12/17		06/12/17		06/12/17		06/12/17		06/12/17		06/12/17		06/12/17		06/12/17		06/12/17	
Sample Description					CLAYEY SILT, reddish brown, loose, soft, wet to GRAVELLY SAND, reddish brown, coarse grain, poorly sorted, firm wet		GRAVELLY SAND, reddish brown, coarse grain, poorly sorted, firm wet		SILTY CLAY, reddish brown, loose, soft, wet to SILTY SAND, reddish brown, fine grain, well sorted, wet		Field Duplicate		GRAVELLY SAND, reddish brown, coarse grain, poorly sorted, wet		GRAVELLY SAND, reddish brown, coarse grain, poorly sorted		SILTY SAND, reddish brown, fine grain, well sorted, loose, soft, wet		SAND, reddish brown, fine grained, well sorted, firm, wet to CLAYEY SAND, red - brown mottled, fine grain, well sorted, soft		GRAVEL and SAND, brown, coarse grain, small to large gravel, poorly sorted, wet		GRAVELLY SAND	
					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	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ANTIMONY	7440-36-0	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ARSENIC	7440-38-2	9.79	9.79	33.0	1.1	–	–	–	2.3	–	2.6	–	–	–	1.6	–	0.6	–	–	–	2.9	–	1.0	–
BARIUM	7440-39-3	NA	NA	NA	13	–	–	–	21	–	23	–	–	–	15	–	9.2	–	–	–	12	–	15	–
BERYLLIUM	7440-41-7	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CADMIUM	7440-43-9	0.99	0.99	4.98	0.3	–	–	–	0.3	–	0.3	–	–	–	0.3	–	0.3	–	–	–	<0.2 U	–	0.2	–
CALCIUM	7440-70-2	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CHROMIUM	7440-47-3	43.4	43.4	111	37	–	–	–	32	–	33	–	–	–	30	–	27	–	–	–	19	–	24	–
COBALT	7440-48-4	50	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
COPPER	7440-50-8	31.6	31.6	149	1,500	[1,2,3]	–	–	2,100	[1,2,3]	2,200	[1,2,3]	–	–	1,800	[1,2,3]	650	[1,2,3]	–	–	6,100	[1,2,3]	3,200	[1,2,3]
IRON	7439-89-6	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
LEAD	7439-92-1	35.8	35.8	128	7.0	–	–	–	16	–	16	–	–	–	7.2	–	5.3	–	–	–	24	–	28	–
MAGNESIUM	7439-95-4	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MANGANESE	7439-96-5	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MERCURY	7439-97-6	0.174	0.18	1.06	0.2	[1,2]	–	–	0.3	[1,2]	0.3	[1,2]	–	–	0.07	–	0.07	–	–	–	<0.06 U	–	0.1	–
NICKEL	7440-02-0	22.7	22.7	48.6	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
POTASSIUM	7440-23-5	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SILVER	7440-22-4	0.5	NA	NA	2.6	[1]	–	–	3.2	[1]	3.4	[1]	–	–	1.6	[1]	1.6	[1]	–	–	3.7	[1]	4.0	[1]
SODIUM	7440-23-5	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
VANADIUM	7440-62-2	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ZINC	7440-66-6	121	121	459	99	–	–	–	110	–	110	–	–	–	80	–	76	–	–	–	81	–	91	–
Inorganics - Cyanide (mg/kg)																								
CYANIDE	57-12-5	0.0001	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Organics - PCBs (ug/kg)																								
TOTAL PCBs	TPCB	59.8	59.8	676	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Organics - SVOCs (ug/kg)																								
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	182	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DI-N-BUTYLPHTHALATE	84-74-2	1114	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
FLUORANTHENE	206-44-0	423	423	2,230	–	–	–	–	300	–	<290 U	–	–	–	–	–	<260 U	–	–	–	<250 U	–	–	–
PENTACHLOROPHENOL	87-86-5	23,000	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PHENANTHRENE	85-01-8	204	204	1,170	–	–	–	–	<280 U	–	<290 U	–	–	–	–	–	<260 U	–	–	–	<250 U	–	–	–
PYRENE	129-00-0	195	195	1,520	–	–	–	–	280	[1,2]	<290 U	–	–	–	–	–	<260 U	–	–	–	<250 U	–	–	–
Organics - VOCs (ug/kg)																								
					–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Organics - Pesticides																								
					–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

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

TABLE 5-6
Sample Analytical Summary - Sediment
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Station Name	CAS Number	[1] EPA Region 5 Ecological Screening Level (ESL)	[2] Threshold Effect Concentration (TEC)	[3] Probable Effect Concentration (PEC)	QMCM-SD42						QMCM-SD43				QMCM-SD46						QMCM-SD47		SD-01 (MDEQ 2013)	
Sample ID					QMCM-SD42 0-1.3'		QMCM-SD42 1.3-2.75'		QMCM-SD42 1.3-2.75' FD		QMCM-SD43 0-0.9'		QMCM-SD43 0.9-3'		QMCM-SD46 0-2.5'		QMCM-SD46 2.5'-5.2'		QMCM-SD46 2.5'-5.2' dup		QMCM-SD47 0-2'		E3PX1 & ME3PX1 & SD-1	
Sample Depth (bgs)					0 - 1.3 ft		1.3 - 2.75 ft		1.3 - 2.75 ft		0 - 0.9 ft		0.9 - 3 ft		0 - 2.5 ft		2.5 - 5.2 ft		2.5 - 5.2 ft		0 - 2 ft		0 - 6 in	
Sample Date					06/12/17		06/12/17		06/12/17		06/12/17		06/12/17		06/13/17		06/13/17		06/13/17		06/09/17		09/10/13	
Sample Description					SILTY SAND, brown, loose, soft, firming downward, wet		SILTY SAND, brown, loose, soft, firming downward, wet		Field Duplicate		SILTY SAND, reddish brown, fine grain, firm, less fines than above		SILTY SAND, reddish brown, fine grain, firm, less fines than above		SILTY CLAY, reddish brown, loose, soft		SILTY CLAY, reddish brown, loose, soft to SAND, brown, medium grain, well sorted		Field Duplicate		SAND, fine grain, some gravel, red to GRAVELLY SAND, coarse grain, well sorted, red and brown, wet, black streak at 2ft, no odor		Wet, reddish brown, fine gravel with some coarse sand	
					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	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	6,630	–
ANTIMONY	7440-36-0	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0.57 J	–
ARSENIC	7440-38-2	9.79	9.79	33.0	1.1	–	–	–	–	–	1.0	–	–	–	9.2	–	–	–	–	–	1.1	–	2.3	–
BARIUM	7440-39-3	NA	NA	NA	16	–	–	–	–	–	30	–	–	–	27	–	–	–	–	–	20	–	<18.6 UJ	–
BERYLLIUM	7440-41-7	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0.42 J	–
CADMIUM	7440-43-9	0.99	0.99	4.98	0.3	–	–	–	–	–	0.3	–	–	–	0.2	–	–	–	–	–	0.3	–	0.16 J	–
CALCIUM	7440-70-2	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3,040	–
CHROMIUM	7440-47-3	43.4	43.4	111	33	–	–	–	–	–	32	–	–	–	56	[1,2]	–	–	–	–	21	–	10.7	–
COBALT	7440-48-4	50	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	6.9 J	–
COPPER	7440-50-8	31.6	31.6	149	890	[1,2,3]	–	–	–	–	710	[1,2,3]	–	–	1,900	[1,2,3]	–	–	–	–	1,500	[1,2,3]	14.3	–
IRON	7439-89-6	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	16,700	–
LEAD	7439-92-1	35.8	35.8	128	9	–	–	–	–	–	18	–	–	–	6.1	–	–	–	–	–	5.8	–	2.4 J	–
MAGNESIUM	7439-95-4	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	5,850	–
MANGANESE	7439-96-5	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	308	–
MERCURY	7439-97-6	0.174	0.18	1.06	0.1	–	–	–	–	–	0.1	–	–	–	0.5	[1,2]	–	–	–	–	<0.06 U	–	<0.1 U	–
NICKEL	7440-02-0	22.7	22.7	48.6	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	14.8	–
POTASSIUM	7440-23-5	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	296 J	–
SILVER	7440-22-4	0.5	NA	NA	1.5	[1]	–	–	–	–	1.2	[1]	–	–	2.6	[1]	–	–	–	–	1.2	[1]	1.8	[1]
SODIUM	7440-23-5	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	144 J	–
VANADIUM	7440-62-2	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	34.7	–
ZINC	7440-66-6	121	121	459	93	–	–	–	–	–	98	–	–	–	170	[1,2]	–	–	–	–	65	–	37.9	–
Inorganics - Cyanide (mg/kg)																								
CYANIDE	57-12-5	0.0001	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	<0.58 U	–
Organics - PCBs (ug/kg)																								
TOTAL PCBs	TPCB	59.8	59.8	676	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Organics - SVOCs (ug/kg)																								
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	182	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	53 J	–
DI-N-BUTYLPHTHALATE	84-74-2	1114	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	110 J	–
FLUORANTHENE	206-44-0	423	423	2,230	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	<240 U	–	<190 U	–
PENTACHLOROPHENOL	87-86-5	23,000	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	370 R	–
PHENANTHRENE	85-01-8	204	204	1,170	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	<240 U	–	<190 U	–
PYRENE	129-00-0	195	195	1,520	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	<240 U	–	<190 U	–
Organics - VOCs (ug/kg)																								
					–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	ND	–	ND	–
Organics - Pesticides																								
					–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	ND	–

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

TABLE 5-6
Sample Analytical Summary - Sediment
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Station Name	CAS Number	[1] EPA Region 5 Ecological Screening Level (ESL)	[2] Threshold Effect Concentration (TEC)	[3] Probable Effect Concentration (PEC)	SD-02 (MDEQ 2013)				SD-03 (MDEQ 2013)				SD-04 (MDEQ 2013)		SD-05 (MDEQ 2013)		TL08-02		TL08-04		TL08-05		TL08-09		TL08-016	
Sample ID					E3PX2 & ME3PX2 & SD-2		E3PX3 & ME3PX3 & SD-2D		E3PX4 & ME3PX4 & SD-3		ME3PX4D		E3PX5 & ME3PX5 & SD-4		E3PX6 & ME3PX6 & SD-5		TL08-02		TL08-04		TL08-05		TL08-09		TL08-016	
Sample Depth (bgs)					0 - 4 in		0 - 4 in		0 - 6 in		0 - 6 in		0 - 6 in		0 - 6 in		–		–		–		–		–	
Sample Date					09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		08/26/08		08/26/08		08/27/08		08/26/08		08/26/08	
Sample Description					Wet, reddish brown, coarse sand to fine gravel		Field Duplicate		Wet, reddish brown, fine gravel with some coarse sand		Duplicate		Wet, reddish brown, fine to coarse sand with some fine gravel		Wet, brown, coarse 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
Inorganics - Metals (mg/kg)																										
ALUMINUM	7429-90-5	NA	NA	NA	**6,380**	–	**6,190**	–	**7,020**	–	**7,290**	–	**7,950**	–	**6,050**	–	–	–	–	–	–	–	–	–	–	–
ANTIMONY	7440-36-0	NA	NA	NA	**0.51 J**	–	**0.37 J**	–	**0.52 J**	–	**0.61 J**	–	**0.56 J**	–	**0.5 J**	–	–	–	–	–	–	–	–	–	–	–
ARSENIC	7440-38-2	9.79	9.79	33.0	**2.2**	–	**2.1**	–	**2**	–	**1.9**	–	**1.6**	–	**1.5**	–	–	–	–	–	–	–	–	–	–	–
BARIUM	7440-39-3	NA	NA	NA	<17.5 UJ	–	<17.6 UJ	–	<16.8 UJ	–	<17.2 U	–	<16.8 UJ	–	R	–	–	–	–	–	–	–	–	–	–	–
BERYLLIUM	7440-41-7	NA	NA	NA	**0.28 J-**	–	**0.21 J-**	–	**0.2 J-**	–	**0.24 J**	–	**0.1 J-**	–	**0.15 J-**	–	–	–	–	–	–	–	–	–	–	–
CADMIUM	7440-43-9	0.99	0.99	4.98	**0.18 J**	–	**0.2 J**	–	**0.23 J**	–	**0.22 J**	–	**0.15 J**	–	**0.13 J**	–	–	–	–	–	–	–	–	–	–	–
CALCIUM	7440-70-2	NA	NA	NA	**3,970**	–	**4,150**	–	**6,300**	–	**6,380**	–	**5,380**	–	**9,410**	–	–	–	–	–	–	–	–	–	–	–
CHROMIUM	7440-47-3	43.4	43.4	111	**13.8**	–	**11.6**	–	**12**	–	**13.3**	–	**15.4**	–	**12.5 J**	–	–	–	–	–	–	–	–	–	–	–
COBALT	7440-48-4	50	NA	NA	**7.2 J**	–	**6.1 J**	–	**7.9 J**	–	**8.2**	–	**11.1 J**	–	**7 J**	–	–	–	–	–	–	–	–	–	–	–
COPPER	7440-50-8	31.6	31.6	149	**292**	[1,2,3]	**125**	[1,2]	**1,110**	[1,2,3]	**1,130**	[1,2,3]	**133**	[1,2]	**161**	[1,2,3]	–	–	–	–	–	–	–	–	–	–
IRON	7439-89-6	NA	NA	NA	**16,900**	–	**13,600**	–	**17,800**	–	**18,300**	–	**16,400**	–	**13,700**	–	–	–	–	–	–	–	–	–	–	–
LEAD	7439-92-1	35.8	35.8	128	**4.5 J**	–	**4.3 J**	–	**3.6 J**	–	**3.7**	–	**4.3 J**	–	**6.3**	–	–	–	–	–	–	–	–	–	–	–
MAGNESIUM	7439-95-4	NA	NA	NA	**5,040**	–	**4,430**	–	**5,640**	–	**5,810**	–	**6,910**	–	**4,970**	–	–	–	–	–	–	–	–	–	–	–
MANGANESE	7439-96-5	NA	NA	NA	**235**	–	**252**	–	**261**	–	**268**	–	**271**	–	**195**	–	–	–	–	–	–	–	–	–	–	–
MERCURY	7439-97-6	0.174	0.18	1.06	**0.019 J**	–	**0.011 J**	–	**0.048 J**	–	**0.041 J**	–	**0.032 J**	–	**0.011 J**	–	–	–	–	–	–	–	–	–	–	–
NICKEL	7440-02-0	22.7	22.7	48.6	**14.5**	–	**13.5**	–	**15.7**	–	**16.3**	–	**22.1**	–	**19.6 J**	–	–	–	–	–	–	–	–	–	–	–
POTASSIUM	7440-23-5	NA	NA	NA	**145 J-**	–	**160 J-**	–	**97.6 J-**	–	**103 J**	–	**139 J-**	–	<469 U	–	–	–	–	–	–	–	–	–	–	–
SILVER	7440-22-4	0.5	NA	NA	**2.0**	[1]	**1.7**	[1]	**2.3**	[1]	**2.2**	[1]	**1.8**	[1]	**1.6 J+**	[1]	–	–	–	–	–	–	–	–	–	–
SODIUM	7440-23-5	NA	NA	NA	**89.6 J**	–	**99.3 J**	–	**127 J**	–	**140 J**	–	**101 J**	–	**179 J**	–	–	–	–	–	–	–	–	–	–	–
VANADIUM	7440-62-2	NA	NA	NA	**33.5**	–	**29.1**	–	**31.4**	–	**32.8**	–	**30.4**	–	**30.8**	–	–	–	–	–	–	–	–	–	–	–
ZINC	7440-66-6	121	121	459	**38.2**	–	**31.8**	–	**35.9**	–	**37.3**	–	**41.5**	–	**30.1**	–	–	–	–	–	–	–	–	–	–	–
Inorganics - Cyanide (mg/kg)																										
CYANIDE	57-12-5	0.0001	NA	NA	<0.61 U	–	<0.63 U	–	<0.6 U	–	<0.6 U	–	<0.61 U	–	<0.58 U	–	–	–	–	–	–	–	–	–	–	–
Organics - PCBs (ug/kg)																										
TOTAL PCBs	TPCB	59.8	59.8	676	–	–	–	–	–	–	–	–	–	–	–	–	ND	–	ND	–	ND	–	ND	–	ND	–
Organics - SVOCs (ug/kg)																										
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	182	NA	NA	**48 J**	–	**69 J**	–	<200 U	–	–	–	<200 U	–	<200 U	–	–	–	–	–	–	–	–	–	–	–
DI-N-BUTYLPHTHALATE	84-74-2	1114	NA	NA	**90 J**	–	**71 J**	–	**82 J**	–	–	–	**54 J**	–	**270**	–	–	–	–	–	–	–	–	–	–	–
FLUORANTHENE	206-44-0	423	423	2,230	<200 U	–	<200 U	–	<200 U	–	–	–	<200 U	–	<200 U	–	–	–	–	–	–	–	–	–	–	–
PENTACHLOROPHENOL	87-86-5	23,000	NA	NA	390 R	–	380 R	–	390 R	–	–	–	**630 J**	–	380 R	–	–	–	–	–	–	–	–	–	–	–
PHENANTHRENE	85-01-8	204	204	1,170	<200 U	–	<200 U	–	<200 U	–	–	–	<200 U	–	<200 U	–	–	–	–	–	–	–	–	–	–	–
PYRENE	129-00-0	195	195	1,520	<200 U	–	<200 U	–	<200 U	–	–	–	<200 U	–	<200 U	–	–	–	–	–	–	–	–	–	–	–
Organics - VOCs (ug/kg)																										
					ND	–	ND	–	ND	–	–	–	ND	–	ND	–	–	–	–	–	–	–	–	–	–	–
Organics - Pesticides																										
					ND	–	ND	–	ND	–	–	–	ND	–	ND	–	–	–	–	–	–	–	–	–	–	–

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

TABLE 5-6
Sample Analytical Summary - Sediment
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Station Name	CAS Number	[1] EPA Region 5 Ecological Screening Level (ESL)	[2] Threshold Effect Concentration (TEC)	[3] Probable Effect Concentration (PEC)	TL08-018		TL08-022		TL08-036		TL08-041		TL08-045		TL08-050		TL08-061		TL08-062		TL08-063		TL08-064		TL08-065		TL08-164	
Sample ID					TL08-018		TL08-022		TL08-036		TL08-041		TL08-045		TL08-050		TL08-061		TL08-062		TL08-063		TL08-064		TL08-065		TL08-164	
Sample Depth (bgs)					–		–		–		–		–		–		–		–		–		–		–		–	
Sample Date					08/26/08		08/27/08		08/26/08		08/26/08		08/27/08		08/26/08		08/28/08		08/28/08		08/28/08		08/28/08		08/28/08		08/28/08	
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
Inorganics - Metals (mg/kg)																												
ALUMINUM	7429-90-5	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ANTIMONY	7440-36-0	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ARSENIC	7440-38-2	9.79	9.79	33.0	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BARIUM	7440-39-3	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BERYLLIUM	7440-41-7	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CADMIUM	7440-43-9	0.99	0.99	4.98	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CALCIUM	7440-70-2	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CHROMIUM	7440-47-3	43.4	43.4	111	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
COBALT	7440-48-4	50	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
COPPER	7440-50-8	31.6	31.6	149	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
IRON	7439-89-6	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
LEAD	7439-92-1	35.8	35.8	128	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MAGNESIUM	7439-95-4	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MANGANESE	7439-96-5	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MERCURY	7439-97-6	0.174	0.18	1.06	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
NICKEL	7440-02-0	22.7	22.7	48.6	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
POTASSIUM	7440-23-5	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SILVER	7440-22-4	0.5	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SODIUM	7440-23-5	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
VANADIUM	7440-62-2	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ZINC	7440-66-6	121	121	459	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Inorganics - Cyanide (mg/kg)																												
CYANIDE	57-12-5	0.0001	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Organics - PCBs (ug/kg)																												
TOTAL PCBs	TPCB	59.8	59.8	676	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–
Organics - SVOCs (ug/kg)																												
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	182	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DI-N-BUTYLPHTHALATE	84-74-2	1114	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
FLUORANTHENE	206-44-0	423	423	2,230	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PENTACHLOROPHENOL	87-86-5	23,000	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PHENANTHRENE	85-01-8	204	204	1,170	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PYRENE	129-00-0	195	195	1,520	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Organics - VOCs (ug/kg)																												
					–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Organics - Pesticides																												
					–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

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

TABLE 5-6
Sample Analytical Summary - Sediment
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Sediment Table Footnotes:

- ESLs, TECs, and PECs are adapted from Appendix A and Appendix B of Michigan Department of Environmental Quality - 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. If no analytes are listed below a gray row then all analytes of that group were either not analyzed or not detected. ND indicates that one or more analyte of that group was tested and not detected and a -- indicates not analyzed.

- **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 5 RCRA ESLs dated August 22, 2003

[2] - TECs from MacDonald *et al.* 2000

[3] - PECs from MacDonald *et al.* 2000

Evaluation based on MDEQ 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.

-- = Not analyzed/Not Reported

bgs = Below ground surface

ESL = Ecological Screening Level

ft = Feet

in = Inches

mg/kg = Milligrams per kilogram.

PCBs = Polychlorinated biphenyls

PEC = Probable Effect Concentration

RCRA = Resource Conservation and Recovery Act

SVOCs = Semi-volatile organic compounds

TEC = Threshold Effect Concentration

ug/kg = Micrograms per kilogram

VOCs = Volatile organic compounds

Criteria Footnotes:

NA = A criterion or value is not available

Laboratory Footnotes:

J = The result is an estimated quantity

J+ = The result is an estimated quantity, but the result may be biased high

J- = The result is an estimated quantity, but the result may be biased low

ND = Not Detected

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

TABLE 5-7
Sample Analytical Summary - Surface Water and SPMD
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Station Name	CAS Number	[4] EPA Region 5 Ecological Screening Level (ESL)	[5] Rule 57 HNV Drink	[6] Rule 57 HCV Drink	[7] Rule 57 WV	QMCM-SW01		QMCM-SW02		QMCM-SW03				QMCM-SW04		QMCM-SW05		QMCM-SW06		QMCM-SW07		QMCM-SW08	
Sample ID						QMCM-SW01		QMCM-SW02		QMCM-SW03		QMCM-SW03 Duplicate		QMCM-SW04		QMCM-SW05		QMCM-SW06		QMCM-SW07		QMCM-SW08	
Sample Date						06/08/17		06/09/17		06/09/17		06/09/17		06/09/17		06/09/17		06/09/17		06/09/17		06/09/17	
Sample Interval (bgs)						–		–		–		–		–		–		–		–		–	
Sample Description						Eastern pond near Quincy Reclamation Plant		Western pond near Quincy Reclamation Plant		Drainage channel between Quincy Reclamation Plant and Quincy Stamp Sands		Field Duplicate		Drainage channel between Quincy Reclamation Plant and Quincy Stamp Sands		Drainage channel near Quincy Stamp Sands		Wood-lined pits east of Eastern pond near Quincy Reclamation Plant - Shore Plant		Wood-lined pits east of Eastern pond near Quincy Reclamation Plant - Shore Plant		Sheen observed in ditch	
						Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Inorganics - Metals (ug/l)																							
ALUMINUM	7429-90-5	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
BARIUM	7440-39-3	220	1,900	NA	NA	18	–	**430**	[4]	75	–	76	–	25	–	23	–	120	–	140	–	18	–
BERYLLIUM	7440-41-7	3.6	160	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CALCIUM	7440-70-2	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CHROMIUM	7440-47-3	42	120	NA	NA	< 1.0 U	–	< 1.0 U	–	1.3	–	1.3	–	< 1.0 U	–	1.8	–	< 1.0 U	–	< 1.0 U	–	< 1.0 U	–
COPPER	7440-50-8	1.58	470	NA	NA	**41**	[4]	**40**	[4]	**94**	[4]	**100**	[4]	**37**	[4]	**36**	[4]	**20**	[4]	**8.6**	[4]	**32**	[4]
IRON	7439-89-6	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
LEAD	7439-92-1	1.17	14	NA	NA	< 1.0 U	–	< 1.0 U	–	< 1.0 U	–	< 1.0 U	–	< 1.0 U	–	< 1.0 U	–	**17**	[4,5]	**5.6**	[4]	< 1.0 U	–
MAGNESIUM	7439-95-4	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MANGANESE	7439-96-5	NA	1,300	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
NICKEL	7440-02-0	28.9	2,600	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
POTASSIUM	7440-09-7	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SODIUM	7440-23-5	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ZINC	7440-66-6	65.7	3,300	NA	NA	< 5.0 U	–	6.4	–	9.4	–	9.7	–	< 5.0 U	–	7.6	–	< 5.0 U	–	< 5.0 U	–	< 5.0 U	–
Inorganics - Cyanide (ug/l)																							
						–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Organics - PCB Aroclors (ug/l)																							
TOTAL PCBs	TPCB	0.00012	NLS	0.000026	0.00012	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–
Organics - PCB Congeners (ug/l)																							
PCB 028	–	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PCB 031	–	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PCB 033	–	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PCB 037-042	–	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PCB 044	–	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PCB 049	–	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PCB 052	–	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PCB 066-095	–	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PCB 070	–	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PCB 077a-110	–	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PCB 087	–	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PCB 090-101	–	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PCB 118a	–	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PCB 138a-163	–	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PCB 153	–	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PCB 174	–	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TOTAL PCBS	TPCB	0.00012	NLS	0.000026	0.00012	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Organics - SVOCs (ug/l)																							
BUTYL BENZYL PHTHALATE	85-68-7	23	6.9	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Organics - VOCs (ug/l)																							
						–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Organics - Pesticides (ug/l)																							
						–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Field Parameters																							
Conductivity (mS/cm)	–	NA	NA	NA	NA	0.221		0.706		0.182				0.151		0.105		0.226		0.17		0.124	
DO (%)	–	NA	NA	NA	NA	83.1		1.5		78.4				69.6		35.6		44.6		38.6		105	
pH	–	NA	NA	NA	NA	8.28		7.94		7.57				7.34		7.06		7.69		7.16		7.19	
Temperature (°C)	–	NA	NA	NA	NA	21.2		11.1		19.6				17.2		18.5		22.7		17.8		24.6	
Turbidity (NTU)	–	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 5-7
Sample Analytical Summary - Surface Water and SPMD
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Station Name	CAS Number	[4] EPA Region 5 Ecological Screening Level (ESL)	[5] Rule 57 HNV Drink	[6] Rule 57 HCV Drink	[7] Rule 57 WV	SPMD Site #5		SW-01 (MDEQ 2013)		SW-02 (MDEQ 2013)				SW-03 (MDEQ 2013)		SW-04 (MDEQ 2013)		SW-05 (MDEQ 2013)		SW-06 (MDEQ 2013)	
Sample ID						SPMD Site #5		E3PW4 & ME3PW4		E3PW5 & ME3PW5		E3PW6 & ME3PW6		E3PW7 & ME3PW7		E3PW8 & ME3PW8		E3PW9 & ME3PW9		E3PX0 & ME3PX0	
Sample Date						11/18/05		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13		09/10/13	
Sample Interval (bgs)						4 ft		10 in		8 in		8 in		6 in		18 in		10 in		6 in	
Sample Description						–		Clear		Clear		Field Duplicate		Clear		Clear		Clear		Clear	
						Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds	Result	Exceeds
Inorganics - Metals (ug/l)																					
ALUMINUM	7429-90-5	NA	NA	NA	NA	–	–	45.8 J	–	36.7 J	–	28.3 J	–	27 J	–	30 J	–	<200 U	–	<200 U	–
BARIUM	7440-39-3	220	1,900	NA	NA	–	–	<200 U	–	<200 U	–	<200 U	–	<200 U	–	<200 U	–	**225**	[4]	<200 U	–
BERYLLIUM	7440-41-7	3.6	160	NA	NA	–	–	< 5.0 U	–	< 5.0 U	–	< 5.0 U	–	< 5.0 U	–	< 5.0 U	–	< 5.0 U	–	0.94 J-	–
CALCIUM	7440-70-2	NA	NA	NA	NA	–	–	34000	–	33300	–	33800	–	34200	–	16900	–	52900	–	38600	–
CHROMIUM	7440-47-3	42	120	NA	NA	–	–	<10 U	–	<10 U	–	<10 U	–	<10 U	–	<10 U	–	<10 U	–	<10 U	–
COPPER	7440-50-8	1.58	470	NA	NA	–	–	**4.0 J**	[4]	**7.2 J**	[4]	**7.5 J**	[4]	**10.8 J**	[4]	**23.1 J**	[4]	**18 J**	[4]	**39.7**	[4]
IRON	7439-89-6	NA	NA	NA	NA	–	–	25.3 J	–	19.1 J	–	20.1 J	–	<100 U	–	63.6 J	–	221	–	2430	–
LEAD	7439-92-1	1.17	14	NA	NA	–	–	<10 U	–	<10 U	–	<10 U	–	<10 U	–	<10 U	–	<10 U	–	**13.8**	[4]
MAGNESIUM	7439-95-4	NA	NA	NA	NA	–	–	10300	–	9980	–	10200	–	10400	–	3670 J	–	8630	–	1370 J	–
MANGANESE	7439-96-5	NA	1,300	NA	NA	–	–	4.1 J	–	3 J	–	2.1 J	–	<15 U	–	6.7 J	–	52.9	–	214	–
NICKEL	7440-02-0	28.9	2,600	NA	NA	–	–	<40 U	–	<40 U	–	0.57 J	–	0.47 J	–	0.56 J	–	0.69 J	–	2.4 J	–
POTASSIUM	7440-09-7	NA	NA	NA	NA	–	–	<5,000 U	–	<5,000 U	–	<5000 U	–	<5000 U	–	<5000 U	–	4610 J	–	5520	–
SODIUM	7440-23-5	NA	NA	NA	NA	–	–	4,670 J	–	4,360 J	–	4,590 J	–	4590 J	–	8430	–	45300	–	14800	–
ZINC	7440-66-6	65.7	3,300	NA	NA	–	–	<60 U	–	<60 U	–	<60 U	–	<60 U	–	<60 U	–	<60 U	–	**72.7 J+**	[4]
Inorganics - Cyanide (ug/l)																					
						–	–	<10 U	–	<10 U	–	<10 U	–	<10 U	–	<10 U	–	<10 U	–	<10 U	–
Organics - PCB Aroclors (ug/l)																					
TOTAL PCBs	TPCB	0.00012	NLS	0.000026	0.00012	–	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–
Organics - PCB Congeners (ug/l)																					
PCB 028	–	NA	NA	NA	NA	2.4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PCB 031	–	NA	NA	NA	NA	1.7	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PCB 033	–	NA	NA	NA	NA	1.1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PCB 037-042	–	NA	NA	NA	NA	1.8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PCB 044	–	NA	NA	NA	NA	1.3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PCB 049	–	NA	NA	NA	NA	3.4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PCB 052	–	NA	NA	NA	NA	2.2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PCB 066-095	–	NA	NA	NA	NA	1.8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PCB 070	–	NA	NA	NA	NA	1.2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PCB 077a-110	–	NA	NA	NA	NA	2.2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PCB 087	–	NA	NA	NA	NA	0.6	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PCB 090-101	–	NA	NA	NA	NA	1.2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PCB 118a	–	NA	NA	NA	NA	0.8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PCB 138a-163	–	NA	NA	NA	NA	0.7	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PCB 153	–	NA	NA	NA	NA	0.9	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PCB 174	–	NA	NA	NA	NA	0.9	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TOTAL PCBS	TPCB	0.00012	NLS	0.000026	0.00012	23	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Organics - SVOCs (ug/l)																					
BUTYL BENZYL PHTHALATE	85-68-7	23	6.9	NA	NA	–	–	< 5.0 U	–	< 5.0 U	–	< 5.0 U	–	< 5.0 U	–	1.4 J	–	1.1 J	–	< 5.0 U	–
Organics - VOCs (ug/l)																					
						–	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–
Organics - Pesticides (ug/l)																					
						–	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–	ND	–
Field Parameters																					
Conductivity (mS/cm)	–	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DO (%)	–	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
pH	–	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Temperature (°C)	–	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Turbidity (NTU)	–	NA	NA	NA	NA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

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

TABLE 5-7
Sample Analytical Summary - Surface Water and SPMD
Quincy Mining Company Mason Operations Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Surface Water Table Footnotes:

- MDEQ Rule 57 values derived from the Michigan Department of Environmental Quality, 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 February 27, 2014.
- ESLs are adapted from Appendix A and Appendix B of Michigan Department of Environmental Quality - 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. If no analytes are listed below a gray row then all analytes of that group were either not analyzed or not detected. ND indicates that one or more analyte of that group was tested and not detected and a -- indicates not analyzed.
- SPMD results are not compared to surface water criteria.
- **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:

  [4] - EPA Region 5 RCRA ESLs dated August 22, 2003

  [5] - MDEQ Rule 57 Water Quality Value, HNV, drinking water source, dated February 27, 2014

  [6] - MDEQ Rule 57 Water Quality Value, HCV, drinking water source, dated February 27, 2014

  [7] - MDEQ Rule 57 Water Quality Value, WV, dated February 27, 2014

Evaluation based on MDEQ Criteria at time of Project completion.

-- = Not analyzed/Not reported
bgs = below ground surface
DO = Dissolved Oxygen
EPA = United States Environmental Protection Agency
ESL = Ecological Screening Level
mS/cm = MilliSiemens per centimeter
ft = feet
HCV = Human Cancer Value
HNV = Human Non-Cancer Value
MDEQ = Michigan Department of Environmental Quality
NTU = Nephelometric Turbidity Unit
PCBs = Polychlorinated biphenyls
RCRA = Resource Conservation and Recovery Act
SPMD = Semi-permeable membrane device
ug/l = Micrograms per liter
WV = Wildlife Value
°C = Degrees Celsius
% = Percentage

Criteria Footnotes:

NA = a criterion or value is not available
NLS = no literature search has been conducted

Laboratory Footnotes:

J = The result is an estimated quantity
J+ = The result is an estimated quantity, but the result may be biased high
J- = The result is an estimated quantity, but the result may be biased low
ND = Not Detected
U = Analyte analyzed for but not detected above the reported sample reporting limit.

APPENDIX A

MTU HISTORICAL SUMMARY

QUINCY MINING FACILITIES ON TORCH LAKE

NARRATIVES & SUPPORTING DOCUMENTS

PART 1

PHASE 3: BUILDING NARRATIVES, MAPS, AND DOCUMENTATION
TORCH LAKE INDUSTRIAL WATERFRONT
From Mason/Quincy Property to Torch Lake South End (Quincy historic properties)

TASK 3:
Historical Archive Research & Mapping

Prepared for:

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
Remediation and Redevelopment Division
55195 US Highway 41
Calumet, Michigan 49913

Prepared by:

MICHIGAN TECHNOLOGICAL UNIVERSITY
Carol MacLennan, Ph.D., Principal Investigator
Daniel Schneider, Research Assistant
Industrial Heritage Program
Social Sciences Department

February 2015

Contract No. Y14110

TABLE OF CONTENTS

[1] A timeline is included for the Turbine Building, also known as the Power House.

[2] Organized chronologically.

Introduction

Phase 3 - Quincy Mining Company Facilities at Mason/Torch Lake

This document encompasses the materials collected by Michigan Technological University (MTU) Social Science staff in support of Phase 3, Task 3 of the Michigan Department of Environmental Quality project to study and sample "Abandoned Mining Wastes of the Torch Lake Non-Superfund Site, Contract No. Y14110."

Divided into two parts, this report documents the facilities present along the southern and western end of the Torch Lake industrial milling and reclamation district that supported the Quincy Mining Company (QMC). Part 1 covers the historical and archival research completed on Quincy milling and reclamation activity. Part 2 provides the geo-referenced Google and GIS maps and the historical maps and blueprints that document and geo-reference the location of each facility. Part 2 will be delivered as a second document to DEQ.

Completed during Fall 2014, research draws upon the business archives, photos, maps, blueprints, and drawings of the Quincy Mining Company at Michigan Technological University (MTU) Archives and the Keweenaw National Historical Park (KNHP) Archives. This landscape and its waterfront facilities supported QMC operations that beginning with milling in the 1880s and continued with reclamation of copper from stamp sands deposited in Torch Lake beginning in the 1940s. All facilities ceased operation by 1970.

These documents (Part 1 and 2) complete the third and final phase of Task 3 (Building Narratives, Maps, and Documentation of the Torch Lake Industrial District) for the Michigan Department of Environmental Quality and its sampling project in Torch Lake. Phase 1 and 2 covered the Lake Linden, Hubbell, and Tamarack areas and resident C&H Mining Company facilities on the Torch Lake industrial waterfront. Phase 3 covers the shoreline in Osceola Township from the southern end of Torch

Lake, along both sides of Highway M-26, northward for nearly two miles. It encompasses the small unincorporated community of Mason. This section also marks the extent of stamp sand deposit (both before and after reclamation of the sands by QMC) in Torch Lake.

The December 2014 Statement of Work (SOW, Appendix A) specifies the following 8 tasks that were to be accomplished by the Social Sciences Department in order to support DEQ, Weston, and MTU in identification of on-water and on-land sampling sites for Phase 3:

Fall 2014: Phase 3

Mason/Quincy Property to Torch Lake South End (Quincy historic properties)

1. Identify major contaminants and waste streams of concern from industrial buildings and likely locations: PCBs (completed through Sea Grant Michigan); chemicals in reclamation processes; sludge from reclamation; slag from smelting; coal-related products such as fly-ash; leaching reagents from stamp mills and reclamation (ammonia, xanthates); others identified in archives.
2. Investigate MTU Quincy Mining Co. archives on building function, production processes, chemical processes, and waste streams by building location.
3. Produce Building Narratives for 6 buildings (in order of location from north to south).[1] Building narratives will be prioritized according to potential to produce significant contaminated wastes to optimize information necessary for soil and sediment sampling in late spring-summer season. Narratives of buildings deemed insignificant for contaminated waste production will be brief, but included in order to document their elimination.
    a. Narratives will detail opening/closing dates; production activities within individual facilities; major updates in processes; repurposing of buildings for different production activities; information on incoming chemical, metal, or other waste and possible exit sites from buildings. Narratives will draw upon archival sources, maps, blueprints, and interviews.

[1] Building names are drawn from official names utilized by Quincy Mining Co. and from Sanborn Co. maps.

b. 6 buildings: Quincy Mill No. 2; Quincy Boiler No. 2; Quincy Power House; Quincy Mill No. 1; Quincy Boiler No. 1; Quincy Reclamation Plant.

4. Collect and scan available Sanborn maps (through 1928) 6 buildings listed above. Blueprints for Quincy Mining Co. buildings have not been located, and may not exist in the MTU or KNHP archives, except for possibly the reclamation plant that was built by C&H.
5. Conduct interviews with knowledgeable individuals about individual plant operations.[2]
6. Provide a spreadsheet of sources consulted, relevance for which waste material or chemical – e.g. Quincy Mining Co. box and files title/# in MTU and KNHP archives.
7. Provide a bibliography of relevant sources that detail or describe significant processing methods, chemical usages, and waste collection strategies for Quincy Mining Co. during period of Torch Lake operations (1880-1970).
8. Identify, if possible, the footprint for buildings identified with DEQ staff as critical for soil sampling. This to be done in collaborating with team member involved with GIS mapping for the project.

We have modified the format of documents presented in the Phase 3 Report to include more extensive narratives on (1) the two Quincy stamp mills; (2) the reclamation plant and related facilities; and (3) other buildings such as boilers, pump house, and coal handling facilities. In addition, instead of the six buildings identified in the SOW (section 3b above), we have provided short narratives of several additional facilities. The reclamation plant is broken down into its different operating components: reclamation plant itself, shore plant, and dredges. Also, the coal docks and shed have been added, as well as the oil house and pump house.

The GIS maps, Sanborn Maps, and blueprints and drawings are provided in Part 2 of this report, to be delivered by MITRI as a separate document.

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[2] KNHP funded oral history interviews during the summer and fall of 2014 with individuals knowledgeable about Quincy facilities on Torch Lake. This was part of a larger project investigating C&H and QMC milling and reclamation on Torch Lake.

The remainder of this document (Part 1 of the Phase 3 Report) is organized into the following sections:

Section 2 contains the Narratives and Timelines of the major buildings and operations at the Quincy Mining Company milling and reclamation site on Torch Lake. Three substantial narratives on (1) the mills, (2) the reclamation plant, and (3) other major buildings, detail their histories and uses. Individual information sheets on thirteen buildings provide a shortened version of important facts for each facility in a uniform format.

Section 3 provides the supporting documentation acquired and summarized from the extensive archival and historical research. An annotated list of the blueprints and drawings acquired from the MTU Archives describes the blueprints and drawings scanned and provided on CDs delivered to DEQ. Print copies of these drawings are available in PART 2 (Maps) of the Phase 3 Report. The next several documents provide a list of the QMC records consulted during the research and the typed notes from these sources. They are organized by Series Number, Folder Name, and Box number to make it easy to locate files. This allows DEQ and Weston staff to return to the original notes and/or documents to pursue additional questions. Other materials included are: interview summaries from two individuals who provided information on QMC reclamation plant operation; an annotated bibliography of secondary sources consulted; and a list of significant individuals from QMC whose names appear regularly in research notes and scanned documents. The multiple documents scanned from the Archives are provided in chronological order, and the location information in the MTU Archives for each is provided in a catalog listing before the scans. Because of the richness of information contained in these documents, they were scanned rather than summarized. Finally, C.H. Benedict's 1944 account of Quincy's copper reclamation operation, from the *Engineering and Mining Journal*, is included at the end.

Research during Fall 2014 was conducted by MS graduate student Dan Schneider Carol MacLennan, Principal Investigator and Professor, supervised and directed the research effort. Both are members of the Industrial Archaeology and Heritage Program in the MTU Social Sciences Department.

Section 2: Narratives & Timelines
Reclamation Plant & Mill Works

Quincy Reclamation Narrative

During the latter part of the 19th century, the two major mining companies of Michigan's Lake copper district built mills for processing their ore on the shores of Torch Lake in Houghton County. The Calumet & Hecla Copper Company built its mills at Lake Linden, at the very northern end of the lake, in the late 1860s. There, they processed mostly conglomerate ore from their mines in and around Calumet. Quincy Mining Company built its mill No. 1 on the Torch Lake shore, at Mason, in 1892, and a second mill about a decade later. In these mills, Quincy processed amygdaloid ore from its mines north of Hancock. Over the course of decades, these mills deposited enough *stamp sand*,[1] the waste product of the milling process, in Torch Lake to radically alter the shape of the lake's shoreline. Early milling technologies were inefficient, and significant copper values remained in the stamp sand. In the early decades of the 20th century, improvements in milling technology, most significantly the introduction of the flotation process, made it possible to reclaim the copper that was in the stamp sand. C&H began reclaiming its conglomerate stamp sand in 1918.[2] Quincy's reclamation plant went into operation in 1943. These reclamation plants' environmental legacy was millions of tons of post-reclamation tailings — stamp sand reground to a powder fine consistency and re deposited in Torch Lake. These *post-reclamation tailings*, [3] which till ontain opper, blanket e lakebed day.

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[1] Note on terminology: In this narrative and elsewhere in this report, "stamp sand" refers to the coarse waste sand Quincy's mills deposited in Torch Lake — the sand the company's dredge recovered for treatment in the reclamation plant.
[2] Benedict, C. Harry. "Six cent Copper from Calumet & Hecla Tailings." *The Engineering and Mining Journal* 117(7). 1924. 277 284.
[3] Throughout this report, the term "post reclamation tailings" is used to describe waste material redeposited into Torch Lake after the reclamation process.

Calumet & Hecla was able to successfully reclaim its tailings much earlier than Quincy because of its stronger financial condition and also because of the nature of its stamp sand. The stamp sand C&H began reclaiming in 1918 was conglomerate stamp sand, containing finer particles of copper than the amygdaloid stamp sand in Quincy's sand banks. The finer copper particles made the conglomerate sands more amenable to flotation treatment using the technology available during the 1920s. Flotation treatment of amygdaloid stamp sand, with its larger copper particles, required a more aggressive machine. A.W. Fahrenwald introduced such a machine in the Lake district in 1929. Quincy would adopt the technology in its No. 1 mill and, eventually, in the reclamation plant.

It took years before Quincy was able to build a reclamation plant to apply the Fahrenwald technology to its stamp sands. The company was shut down completely from 1932 to 1937, during the depths of the Great Depression. After it resumed operations, Quincy investigated several options for building a reclamation plant but lacked the capital to put them into action.[4] That changed on June 26, 1942, when Quincy Mining Company signed a contract with the federal Metals Reserve Company (MRC). The MRC was a subsidiary the federal Reconstruction Finance Corporation formed to secure the nation's strategic metals supply during World War II. The MRC advanced Quincy Mining Company $1.15 million to build and launch a dredge to retrieve its tailings from Torch Lake, and erect a state of the-art reclamation plant to process them.[5] The contract required Quincy to produce 10 million pounds of copper per year, for three years. The MRC purchased this

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[4] One example is shown in a map post dating 10 December, 1941. The map has three pencilled in proposed shore plant locations: two tied to Quincy's No. 1 mill and one tied to its No. 2 mill. Quincy Mining Company Drawings Collection, Drawer 30 E24 C. Michigan Tech Archives and Copper Country Historical Collections.
[5] Copper Sales Contract between Metals Reserve Company and Quincy Mining Company. 26 June, 1942. C&H, Box 521, Folder 3. Michigan Tech Archives and Copper Country Historical Collections.

copper at a premium price. C&H, the third party to the contract, built Quincy's reclamation plant and oversaw its initial operations. This arrangement was expedient for two reasons: C&H had extensive experience with stamp sand reclamation; C&H also had on hand much of the material and equipment necessary to build Quincy's reclamation plant, including an idle regrinding facility, which it would disassemble and re-erect at Quincy's reclamation site at Mason.

Construction began in late 1942 and proceeded throughout most of 1943. By early November of 1943, all six ball mills were in operation in the regrinding plant and Quincy's reclamation plant was up and running.[6] The plant had three principal parts: the dredge, the shore plant, and the regrinding plant. Machinery in the shore plant served mostly to remove water from the dredged tailings before they were carried by enclosed conveyor to the regrinding plant. The shore plant also contained classifying machinery to separate coarse sands, which required regrinding, from "slimes,"[7] fine sand which could proceed directly to flotation.[8] Much of Quincy's reclamation facility was salvaged from C&H's milling complex at Lake Linden. The American Bridge Company disassembled C&H's No. 1 regrinding plant and re erected it on a new concrete foundation at Mason as Quincy's regrinding plant. The same appears to be true for the shore plant and conveyor system.[9]

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[6] C. Lawton to W. P. Todd. 8 November, 1943. QMC. Michigan Tech Archives and Copper Country Historical Collections.

[7] Note on terminology: "Slime" is a nonspecific term mill operators use to describe very fine particles of ore mixed with water. In Michigan's Lake copper district, slime was composed of particles .25 millimeters and smaller. Reference: Benedict, C. Harry. "Milling at the Calumet & Hecla Consolidated Copper Company." *The Mining Congress Journal.* 17(1). 1931. 519 527.

[8] C. H. Benedict. "Reclaiming Quincy Tailings from Torch Lake." *The Engineering and Mining Journal* 145(4). 1944. 74 78.

[9] D. E. Faust to E. R. Lovell. 22 August, 1942. C&H, Box 521, Folder 7. Michigan Tech Archives and Copper Country Historical Collections.

The regrinding plant is where the core operations of the reclamation process took place: grinding, classification, and flotation. The conveyor dropped its dewatered stamp sand into a "surge bin," which fed the sand into six Hardinge ball mills. Hardinge mills were horizontally mounted, conical drums filled with hardened steel balls. When the drums rotated, the balls pulverized the stamp sand into a powder fine enough for treatment by flotation. The consistency was roughly that of baking flour. From the ball mills, the fine ground slime was transferred through a series of concentrating and classifying apparatus, which separated copper-rich material from copper-poor material. Copper-rich material proceeded to flotation machines. Quincy pumped the copper-poor material back into Torch Lake.[10] In 945, Quincy built a 41 foot extension on the south side of the regrinding plant.[11]

Oral history narrators have described the flotation process as it took place in the Fahrenwald flotation machines at Quincy reclamation. In one chamber of the flotation machine, agitators beat a mixture of water and **pine oil** into a bubbly froth. In another, the reagent **xanthate** was introduced to incoming "pulp" from the ball mills. A chemical reaction with the **xanthate** caused the copper particles to adhere to the **pine oil** bubbles when the pulp moved into the frothing chamber. The bubbles lifted the copper particles and a rotating paddle mechanism skimmed the copper bearing froth off the top. The copper-bearing froth was then pumped through filtration and classifying machinery, then into a Dorr thickener, which removed water from the mineral.[12] **Xanthate** and **pine oil**

[10] Benedict. 1944. 74 78.
[11] Quincy Mining Company Annual Report for 1945.
[12] Ibid. The circular concrete foundations of the Dorr thickeners, located on the south side of the Quincy reclamation plant ruins, are arguably the site's most distinctive extant features. "Mineral" is the term mill operators used to describe the concentrated copper product that was sent to the smelter.

were the only chemicals used in the flotation process as it was originally practiced at the Quincy reclamation plant.[13]

Before the concentrated mineral material left the reclamation plant, it went through a drier to remove further moisture in preparation for smelting. This drier may have been fuel oil fired.[14] At all stages in the regrinding process preceding the Dorr thickeners, waste material was pumped back into Torch Lake as post-reclamation tailings. Oral history narrator RK indicated Quincy deposited its post-reclamation tailings to the south of the reclamation plant.

Oral histories and company correspondence indicate **xanthate** and **pine oil** were the only chemicals used in quantity in the flotation process and the reclamation process, overall, though it is possible Quincy experimented with other chemicals from time to time, on a limited basis.[15] In 1947, Quincy's chief purchasing agent J. Chynoweth sent letters to various suppliers seeking price quotes for **pine oil**, stating "we use approximately four tank cars of **Pine Oil** (Steam Distilled) a year and are looking for a source of supply."[16] The reclamation plant consumed **xanthate** in greater volumes. Quincy purchased almost all of its **xanthate** from Dow Chemical Company, ordering between 7,000 and 8,000 pounds, delivered in 250-pound drums, on a monthly basis. By comparison, monthly orders of **pine oil** from the Hercules Powder Company usually totaled between 3,000 and 5,000 pounds.[17] **Pine oil** fed into the flotation process at a rate of 16 to 17.5 cubic centimeters per minute,

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[13] Oral history narrators corroborate Benedict, and the archival research, on this point.
[14] J. Chynoweth to Moorhead Machinery and Boiler Co. 18 September, 1947. QMC, Box 364, Folder 48. Michigan Tech Archives and Copper Country Historical Collections.
[15] These oral accounts match the general description of flotation given in: Philip Rabone. 1932. *Flotation Plant Practice.* London: Mining Publications, Ltd.
[16] J. Chynoweth to various. 2 June, 1947. QMC, Box 364, Folder 40. Michigan Tech Archives and Copper Country Historical Collections.
[17] "Reclamation Plant Supplies, 1947 1967." Ledger book. QMC, Box 661, Folder 1. Michigan Tech Archives and Copper Country Historical Collections.

whereas **xanthate** was fed in at rates ranging from 64 to 69 cubic centimeters per minute.[18] After plant operations ceased in late May of 1967, Quincy sold its remaining stock of **xanthate**, totaling 10,250 pounds, to C&H. Quincy experimented with a sand treatment process involving **sodium sulphide** in 1945. The process, intended to improve copper recovery from oxidized stamp sands, was not successful and, it appears, was never implemented at full production scale.[19] While C&H made extensive use of ammonia leaching to recover copper from conglomerate stamp sand in its reclamation plants at Lake Linden and Tamarack City, Quincy did not implement leaching in its reclamation of amygdaloid stamp sand at Mason. Informant EK said amygdaloid stamp sand was far less amenable to the leaching process because it contained numerous impurities that dissolved in the ammonia solution along with copper. In addition to generating mineral containing an unacceptable level of impurities, treatment of amygdaloid stamp sand by leaching was inefficient because the impurities in the amygdaloid stamp sand "used up" the leaching solution's capacity to dissolve copper to no productive effect.[20]

In contrast to the eight stamp heads in Quincy's mills, which were steam powered, most of the machinery in the reclamation plant, including the Hardinge ball mills in the regrinding plant, were powered by electricity. Quincy purchased most of this power from Calumet & Hecla. Power lines running parallel to the Mineral Range Railroad line carried this electricity, which was generated at C&H's power plant in Lake Linden, from the Tamarack reclamation plant to Mason. The power entered Quincy's reclamation plant

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[18] This information was found handwritten in pencil on the back of a blank ledger sheet filed with Quincy assay reports from the late 1940s and early 1950s. QMC, Box 791, Folder 5. Michigan Tech Archives and Copper Country Historical Collections.
[19] L. Koepel to C. Lawton. 14 November, 1945. QMC, Box 347. Michigan Tech Archives and Copper Country Historical Collections.
[20] Interview with informant EK. October 25, 2014.

through a substation located at the northwest corner of the plant. Part of the substation — including its switchgear and circuit breakers — was located inside the plant itself. There were three large, oil-filled transformers located just outside the plant, also at the northwest corner. There were at least three oil-filled transformers on the dredge in addition to a circuit breaker that held six gallons of oil. The shore plant's electrical requirements appear to have been small in comparison to the regrinding plant's. There were three small transformers associated with the shore plant; it is not clear whether these transformers were ry r il filled.[21]

With its own smelter out of commission since 1931, Quincy made arrangements with the district's other copper companies to refine the mineral produced at the reclamation plant. The first mineral produced at Quincy reclamation was sent to the Copper Range Company's Michigan smelter located two miles west of Houghton. Later records indicate Quincy transported this mineral via both rail and truck. At other times, Quincy shipped its mineral by rail to Calumet & Hecla's smelting works at Hubbell. When C & H had need of its full smelter capacity in late 1948, Quincy put one of the furnaces at its own smelter, at Ripley, back in working order.[22]

Quincy's reclamation plant was in near-continuous operation from November of 1943 to June of 1967, though the plant experienced intermittent shutdowns at various times during its operational life. In total, Quincy's reclamation plant treated 21,096,460 tons of stamp sand from Torch Lake, recovering 101,082,596 pounds of refined copper. Even with better grinding equipment and flotation technology, Quincy's reclamation plant

[21] "Reclamation Plant Inventory." May, 1944. QMC, Box 791, Folder 6. Michigan Tech Archives and Copper Country Historical Collections.
[22] Quincy Mining Company Annual Report for 1948.

was not able to recover 100 percent of the copper present in its mill sands. Between 1943 and 1967, the reclamation plant re-deposited approximately 43,880,777 pounds of copper into Torch Lake in its *post-reclamation tailings*.[23] The reclamation plant's longevity far exceeded Quincy management's expectations. In the first years of the 1950s Quincy's then General Manager C. J. McKie and President Todd thought they were already seeing the writing on the wall for the reclamation operation. "During the year 1950 the Reclamation Plant treated 1,006,355 tons of sand," McKie wrote. "We expect to finish treating all commercial sand in our #1 Pile before the end of 1951. The outlook for successfully treating #2 Pile is not too bright. A large portion of the pile is above water level and is oxidized and cannot be reclaimed."[24]

Quincy's numerous attempts to reclaim oxidized stamp sands in the coming years were mostly frustrated, but this did not stop the reclamation operation. McKie expected Quincy would transition completely to reclaiming the stamp sand deposit from the No. 2 mill in the spring of 1953.[25] This stamp sand deposit was located farther north of the reclamation plant, and dredging it required the installation of a booster pump to forward the stamp sands the additional distance. Operating the booster pump required additional electric power, which Quincy would generate using a diesel engine salvaged from a ship. Quincy's cost reports for the years following the diesel generator's installation indicate

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[23] Production data were collected, and copper redeposition data calculated, from metallurgical reports on Quincy's annual cost sheets. QMC, Boxes 472 474. Michigan Tech Archives and Copper Country Historical Collections.

[24] C. J. McKie to W. P. Todd. 12 June, 1951. QMC. Michigan Tech Archives and Copper Country Historical Collections.

[25] C. J. McKie to H. J. Hardenburg. 5 November, 1952. QMC, Box 372, Folder 4. Michigan Tech Archives and Copper Country Historical Collections.

diesel fuel accounted for only a small portion of the company's electrical energy expenses at the mill. Most of the reclamation plant's electricity continued to come from C&H.[26]

After the diesel engine and booster pump installation, the plant ran without major incident until January 14, 1956, when Quincy's reclamation dredge sunk in 55 feet of water on January 14, 1956. Fortunately for Quincy, the company had purchased a used dredge from C&H only months earlier.[27] The original dredge would stay at the bottom of Torch Lake, where it still sits today marked by a red buoy.

As late as 1969, two years after the reclamation plant shut down for good, Quincy investigated other productive uses for its reclamation plant building, including a rod and wire manufacturing plant. However, none of these plans came to fruition.[28] Informant EK indicated the plant stood idle for several years after its closure before a scrap metal company dismantled the regrinding plant, shore plant, and conveyor apparatus. Most of the plant's serviceable equipment had already been sold by that time, much of it to mine operators in South America.

Extant ruins at the Quincy reclamation plant site at Mason clearly articulate the spatial relationships and equipment arrangements among and within the buildings that comprised the facility. Of the four major structures that were part of the facility, only the enclosed conveyor system that carried stamp sand from the shore plant to the regrinding plant is absent from the landscape. Quincy's second dredge, visible from State Highway 26, rests on the bed of Torch Lake, close to shore. The dredge lists westward, but is remarkably

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[26] Quincy Mining Company Cost Reports, 1953 to 1970. QMC, Boxes 472, 473, and 474. Michigan Tech Archives and Copper Country Historical Collections.
[27] C. J. McKie to W. P. Todd. 24 January, 1956. QMC, Box 372, Folder 5. Michigan Tech Archives and Copper Country Historical Collections.
[28] J. Chynoweth to W.P. Todd. 14 February, 1969. QMC, Box 377, Folder 8. Michigan Tech Archives and Copper Country Historical Collections.

intact, structurally, and most of it is visible above the water. The shore plant's foundation and pilings still stand on the shore and in Torch Lake, respectively. These are located northeast of the regrinding plant's foundation. The regrinding plant foundation is almost completely intact. Machine foundations remain present throughout the plant floor. Spatial aspects of the regrinding and flotation processes can be read in their arrangement. Foundations of substation equipment remain in the northwest corner of the plant ruins, though the equipment itself is absent with the exception of a few power poles and insulators.

Quincy Reclamation Plant Timeline

1921

This is the earliest year for which evidence was found of Quincy Mining Company looking seriously at the idea of reclaiming its Torch Lake stamp sands at Mason.

June 1 Quincy General Manager Charles Lawton writes company president W. Parsons Todd "Re: Cost of Re-treating Stamp Sands." The letter estimates the cost of constructing and equipping a new mill building at $750,000 and a dredging plant to deliver sands to it at $300,000.

1928

Quincy continues speculation and planning related to construction of its own reclamation plant at Mason, but lacks the capital to act on these plans.

July 21 This is the date stamped on a very thorough report Quincy prepared of the equipment and power requirements, and costs thereof, for the construction of a reclamation plant.

1935

By this time, the Calumet & Hecla Mining Company had been successfully operating a reclamation plant farther north on Torch Lake for 17 years. Quincy had apparently been looking into the possibility of reclaiming its stamp sands for some time by this point.

July 17 Michigan College of Mining & Technology wrote Quincy General Manager saying students and faculty at the college had "spent a considerable amount of time on research with regard to the sands." A profitable reclamation operation was possible, Hotchkiss said, advising Quincy to keep an eye out for new reclamation processes developing elsewhere.

1942

This was a year of rapid developments for the Quincy reclamation plant. Early on, the company was making serious plans to build a reclamation plant independently. Wartime federal investment would make the reclamation plant a reality by the end of the year.

1943

Correspondence among company officials and contractors shows effects of wartime shortages on construction effort.

January 11 Letter from Calumet & Hecla's chief draftsman H. E. Williams to D.E. Faust of the American Bridge Company indicates dismantling of the C & H No. 1 regrinding plant was under way and perhaps far along by this time (Williams is taking back steel frame members for C & H; he directs the contractors re-erecting the plant to substitute timber for the reclaimed steel).

1945
June 26 & July 23 Credit memos from the J. H. Green Company indicate unspecified scrap was ing hauled out of the Quincy mill in semi truckloads.

1946
A coal miners' strike cuts off Quincy's fuel supply, idling the plant during May and June of this year. W. Parsons Todd reports to shareholders that the reclamation operation is already beginning to exhaust the older stamp sand deposits (the older, pre 1908, deposits were more copper-rich, since they had originally been milled with less sophisticated technology).

1947
January 8 - Wrecking crew dismantles the unloading towers at Quincy's coal dock for scrap.
December 13 One of few direct, if nonspecific, references to waste disposal related to the reclamation plant: An invoice charging Cook & Riley Inc. of Chicago for freight on 675 pounds "colored waste."

1948
Quincy built a small, new furnace at its smelter in Ripley, putting the facility back into operation for the first time since 1931. Quincy had been smelting its mineral on a toll basis at the C smelter, but C needed the capacity for its own operations.

1952
Quincy is reclaiming sand containing oxidized copper from above the waterline. It is more challenging to recover copper from this sand, likely resulting in higher levels of copper redeposition.

Quincy also installed a 1,000 horsepower diesel engine at the reclamation plant in order to run a booster pump that had been installed to help move tailings the now greater distance from the dredge to the shore.

1956
January Quincy's dredge sunk. This was Quincy's original dredge, which still sits at the bottom of Torch Lake, marked with a buoy, off the Mason shore. Archival records indicate there were transformers on this dredge. It is unclear whether they contained oil. Serendipitously, Quincy had recently purchased a used dredge from C & H at the time when their redge unk.

1958
The plant was idle most of this year but maintained in operable condition.

1959
Todd reported to shareholders this year that the depth of remaining stamp sands was beginning to complicate their removal.

1962

May 31 The sand storage bin in the reclamation plant, also known as the "surge bin," collapsed, killing two employees.

1967

May 27 Reclamation plant shuts down. The plant would stand idle for next several years. Various plans were floated for putting the facility into another use, but none were acted upon.

Quincy Mills Narrative

The Quincy Mining Company's first milling facility was built between 1858 and 1860 on the shore of Portage Lake in Hancock, Michigan, approximately 800 feet west of the north abutment of the Portage Lake Lift Bridge, as the bridge exists today.[1] Quincy used a gravity tram to transport copper ore the relatively short distance from the company's mine shafts at the top of Quincy Hill down to the mill at the edge of the lake. This original mill was equipped with several batteries of gravity stamps, which relied largely on the weight of their iron stamp shoes to provide the force necessary to crush mine rock. Quincy deposited waste sand from the mill in Portage Lake for nearly three decades, and over time this submerged waste sand pile became an impediment to commercial navigation on the waterway. With the passage of the federal River and Harbor Act of 1886, Quincy was forced to relocate its milling operations, and chose a site about six miles north of Hancock, on the shore of Torch Lake.[2] The collection of ore processing facilities and company owned houses Quincy developed at this site would come to be known as Mason.

Construction of the stamp mill at Mason began in the spring of 1888. The original mill building was 120 feet wide by 200 feet long and of wooden construction. While work was under way on the stamp mill itself, Quincy was also laying track for the Quincy & Torch Lake Railroad, which would carry ore from the mines above Hancock to the new stamp mill. At Mason, in addition to the mill itself, Quincy built a boiler house; a pump house; a boarding house, which was "designed for future use as a blacksmith, carpenter, and cooper

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[1] Hancock, Michigan [perspective view]. 1881. Beck and Pauli, Lithographers: Milwaukee. Historic American Engineering Record Collection, Library of Congress. http://lcweb2.loc.gov/master/pnp/habshaer/mi/mi0000/mi0086/photos/088951pu.tif.
[2] O'Connell, Charles F., Jr., "Quincy Mining Company: Stamp Mills & Milling Technologies, c. 1860 1931," in HAER No. MI 2, Historic American Engineering Record. 1979. Washington, D.C.: National Park Service, 8.

shop"; and a dock, 32 feet wide, stretching along 200 feet of the Torch Lake shoreline. All of these structures are shown on the Sanborn fire maps dating from 1907 to 1949. Boiler house No. 1 was located about 250 feet directly east of the mill. The coal dock, with a capacity of 50,000 tons was located about 450 feet east of the mill. Its footprint was approximately 350 feet, north to south, by 275 feet.[3] Site preparations in 1888 also included digging a 600 foot-long adit from Torch Lake to the mill's pump house to provide the needed water for the ore dressing process.[4] Launders connected the mill's boiler house to two small creeks that ran just to the north of mill No. 1. These creeks provided water for the mill's boilers. A "covered bridge" connected the boiler house and the mill. This carried steam pipes over the Quincy & Torch Lake Railroad.[5] The mill's launder originated at the midpoint of the mill's eastern elevation, extending southeast from there at an approximately 45 degree angle.[6]

According to O'Connell, the historian who worked on the Quincy mills report for the Historic American Engineering Record, federal waterways legislation was not the only factor driving Quincy's need to relocate its milling works. The Portage Lake mill's stamping technology was well out of date by the time of the move, and that milling facility was not structurally capable of accommodating the more modern steam stamps, which used steam cylinders to augment the force of gravity in crushing copper ore. Quincy's Portage Lake mill was also too small to allow Quincy to expand its mining operations.[7] When it went into operation in March of 1890, Quincy's first mill on Torch Lake had two heads of steam

[3] Hancock, Michigan [map]. 1917. New York: Sanborn Map & Publishing Company.
[4] Quincy Mining Company Annual Report for 1888.
[5] O'Connell, 36 38. The watercourses of the creeks most closely associated with the mill site, as shown on the 1948 U.S. Geological Survey map, do not conform to McConnell's description. The map shows a Quincy Creek which ran just to the north of mill No. 1 and a second, unnamed creek which ran to the south of the mill site.
[6] Hancock, Michigan [map]. 1907. New York: Sanborn Map & Publishing Company.
[7] McConnell, 25 38.

stamps and room for a third, which Quincy would install and put into operation by 1892.[8] Lankton gives this account of the mine shafts above Hancock that supplied the mill with ore:

> From the 1870s to 1891, Quincy hoisted from two shafts, Nos. 2 and 4, which stood six hundred feet apart. By 1900, Quincy pulled copper rock from five shafts. It opened No. 7 shaft on the southern end of its original works. It hoisted from a rehabilitated Pewabic mine shaft, called Quincy No. 6, an from a No. 8 shaft on teh old Mesnard property. The distance between Quincy's southernmost shaft, No. 7, and its northernmost, No. 8, was 7,500 feet. In 1909, Quincy finally closed the No. 4 shaft, one of its earliest, because the ground tributary to that shaft could be exploited by neighboring shafts. At the same time, Quincy opened a No. 9 shaft to the north, beyond the No. 8 shaft, on the site of the old Pontiac mine.[9]

All of these shafts worked amygdaloid ore.

Additional construction at the mill works site was under way within a year after the original mill went into operation: a 40-foot expansion of the boiler house to make room for two additional boilers. The 1917 Sanborn map shows 12 boilers in the original boiler house building and two larger ilers thin e xpansion.

Construction work on Quincy's No. 2 mill at Mason began in 1898, though preliminary work had been in progress since four years earlier. Mill No. 2 had three heads of steam stamps, which were in operation by 1901. The new boiler house, located east of the mill, was a steel structure with a footprint 56 feet by 90 feet. This second mill's boiler house's coal requirements were smaller than those of the No. 1 boiler house. While the earlier boiler house provided steam for heating the mill works' office, assay office, and carpenter shop in addition to powering the mill's five stamp heads, the boiler for mill No. 2

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[8] Ibid., 39.
[9] Larry Lankton. 2010. *Hollowed Ground: Copper Mining and Community Building on Lake Superior, 1840s-1990s*. Detroit: Wayne State University Press. 114 115.

only had to power three heads of stamps. Mill No. 2's pump house was built from brick and steel, its footprint 54 feet square.[10] All of these buildings are depicted on Sanborn maps.

Mill No. 2 shut down on January 4, 1921, and never reopened.[11] The U.S. copper market was weak during this time, saturated with copper stockpiled during World War I. Calumet & Hecla Consolidated Copper Company also suspended its mining operations and closed its Hecla mill in 1921.[12] It, too, never re-opened. Presumably, Quincy kept its older mill (mill No. 1) in operation because that mill had five stamp heads while mill No. 2 had only three. According to informant EK, Quincy continued to provide the mill with limited steam for heat and electricity for lighting into the 1940s to help preserve the building for possible future use. However, the building's structural steel was scrapped by the late 1940s. Arnold Klatzky, whose scrap yard was located on Canal Road about a mile west of Houghton, was the contractor who dismantled mill No. 2, which is no longer shown on the 1949 Sanborn map. Pump house No. 2 was still present at that time, but the No. 2 boiler house is also gone from the 1949 Sanborn map.

General Manager C.J. McKie summarized periodic equipment upgrades made at the mills during the early 1900s in a 1953 report to company treasurer A.M. Mansfield. Quincy built a new coal dock and coal handling facility in 1902 (See "Other Structures" narrative).[13] The mills' first ball mill unit was installed in 1916. By 1921, ball mills had been installed downstream from all eight steam stamping units at the mills (the three ball mills

[10] Ibid., pages 42 44.
[11] Quincy Mining Company Annual Report for 1921.
[12] Calumet & Hecla Consolidated Copper Company Annual Report for 1921.
[13] Ibid., page 51.

in Quincy's mill No. 2 must have operated only for a short time). Flotation equipment was in operation at mill No. 1 by the end of 1929.[14]

Mill No. 1, along with Quincy's mining and smelting operations, shut down from 1932 to 1937, during the depths of the Great Depression. Quincy's mines and milling works, though not the smelter, resumed operations in 1937. It would take five years of continual, but incremental, repairs and upgrades to bring the mill back to full scale operation.[15]

A report from the federal Bureau of Mines describes Quincy's milling works as it existed 1942. The wartime report was primarily concerned with its vulnerability to espionage and sabotage, but it makes reference to a transformer station the location of which, unfortunately, is not clearly described. The report states only "the transformer station is located about 100 feet from the nearest building and is enclosed in a small wooden structure. No provision has been made to catch oil in an emergency." The report stated Quincy bought power from the county electrical utility on Sundays, holidays, and at other times when its own generating equipment was idle.[16]

Mill No. 1 shut down permanently in 1945. Boiler inspection reports from the following year indicate the mill's boilers had been "out of service for some time" as of May, 1946.[17] In July of 1947, Quincy president William Parsons Todd gave General Manager C. J. McKie permission to have the mill's two launders, which crossed State Highway 26, removed. This was in response to a request from the Michigan state highway department. It

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[14] C.J. McKie to A.M. Mansfield, 23 September 1953. Quincy Mining Company Collection (QMC), Box 748, Folder 4, Michigan Tech Archives and Copper Country Historical Collections.
[15] Quincy Mining Company Annual Reports for 1937 1942.
[16] Bureau of Mines Report: "Vulnerability of Quincy to Sabotage." Unpublished ms. Sept. 7, 1942. QMC, Box 784, Folder 4.
[17] Boiler Inspection Report. May 4, 1946. QMC, Box 364, Folder 72.

is not clear when the launders' removal was actually carried out.[18] According to informant EK, the mill had a machine shop attached to it, which remained in use into the 1950s. The mill building itself remained standing until the early 1960s, when fire destroyed much of it.

Today, the ruins of both of Quincy's mills still stand on the west side of State Highway 26, six miles north of Hancock. There is more standing of mill No. 1. The easternmost portion of the building, which housed the stamp heads, and the central part, which housed roughing jigs, have no roof or walls. A roof and walls, both precarious, still cover the lower portion of the mill, where mineral concentration took place. On the south side of the building there is a walled in depression, with no roof, which contains the foundation for a large thickening tank. Mill No. 1's still standing walls and roof are easily visible from the highway. The ruin of mill No. 2 is harder to see from the highway. It is deeper in the woods than the No. 1 mill. Mill No. 2's walls are completely leveled, but the mill's layout is more clearly visible than that of mill No. 1: stamp foundations at the west end and three distinct floors with the remains of the separating and concentrating equipment's concrete foundations. The concrete turbine building structure standing between the two mill buildings, and the smokestack for the No. 1 boiler house located directly across State Highway 26 from the ruins of mill No. 1, are the most readily visible remnants elsewhere on the site. These ruins are described in more detail in the "Other Structures" narrative.

[18] W.P. Todd to C. J. McKie. July 31, 1947. QMC, Box 372 Folder 1.

Quincy Mill No. 1 Timeline

1888
Quincy Mining Company began construction of its first milling facility at Mason in August of this year. The building would hold two heads of steam stamps initially, with room for a third head to be added later. Construction of the Quincy & Torch Lake Railroad, which would carry ore from Quincy's mines above Hancock to this new stamp mill in Mason, were also underway n 888.

1890
Quincy completed construction of Mill No. 1.

1901
Wilfley tables were installed at Mill No. 1, bringing the mill up to date in its fine-materials separation technology.

1904
Quincy built a mineral house at the west end of the mill to stockpile the mill's product before it was loaded on trains and taken to Quincy's smelter in Ripley.

1910
Quincy uilt a new launder for the mill.

1915
Quincy ordered two Hardinge ball mills, installing one in each of its mills. These conical ball mills, used to grind ore into fine-grained sand, would later be the central component of the Quincy reclamation plant's equipment.

1918
Quincy built an extension to the mill, 215 feet long and 123 feet wide, with red brick and reinforced concrete walls

1920
Two heads of steam stamps were added to Mill No. 1, bringing the total number of stamp heads to five (No. 2 had three heads, so the total number of heads for the mill works was eight at this time). By the end of this year, all of the mill's stamp heads had been equipped with either Hardinge or Marcy ball mills for fine grinding of stamped ore.

1929
Flotation units were installed for three of the mill's five stamp heads. Flotation equipment was added to a fourth stamp head's processing apparatus the following year.

1937
After sitting idle for five years because of the Great Depression, Quincy puts the mill back into operation. Repairs and equipment upgrades would be made on a continual basis over the ourse f e xt ive ears.

1945

The stamp mill closed down permanently. Some of the equipment from the mill was moved to the reclamation plant or sold. Boiler inspection reports dating to May and September of 1946 state the mill's boilers had been "out of service for some time" as of that date. Informant EK indicated a machine shop that was attached to the mill continued in use into the 950s.

1960s

The stamp mill was still standing up until the early 1960s, when much of it was destroyed in a fire, according to informant EK.

Quincy Mill No. 2 Timeline

1898
Quincy selected a site for a second mill building at Mason. Mill No. 2 would be located 630 feet north of mill No. 1. The building would be of steel construction, 132 feet wide by 216 feet long, and would hold three heads of steam stamps.

1900
By the end of this year, two of the three stamp heads were in operation in the No. 2 mill. The third stamp head would be operating by the end of January, 1901.

1918
An addition, 91 feet wide and 132 feet long and constructed from brick, steel, and reinforced concrete was made to the east side of the mill.

1921
The No. 2 mill closed down permanently, though Quincy continued to provide the mill with limited steam for heat and electricity for lighting to help preserve the facility for possible future use into the 1940s.

Late 1940s
The No. 2 Mill's structural steel was scrapped by local scrap metal contractor Arnold Klotzke.

Other Structures: Boiler & Pump Houses, Coal Facilities, Turbine House (Power House)

Boiler Houses and Pumping Houses

Each of the two mills at Quincy's works at Mason had its own boiler house to provide steam power to pump water and drive stamp heads and other machinery. The boiler houses went into operation at the same time as their respective mills. Each mill had its own pumping engines that pumped water from Torch Lake into the mills, to supply water for stamping and ancillary processes. The pumping engines for mill No. 1 were housed in the same building as that mill's boilers, while mill No. 2 had separate buildings for its boilers and pumping engines. The boiler houses are of interest as facilities that burned significant amounts of coal. The operations that took place in the pump houses were purely mechanical, and did not likely cause environmental impact.

Quincy built its first boiler house at Mason concurrently with the No. 1 mill construction, completing the work in 1890.[1] The boilers in this house generated steam to drive the mill's stamp heads and the pumping engines that supplied water to the mill. The boiler house contained 12 steam boilers, initially, and two more were added in 1891.[2] Quincy's boiler water supply was a pair of creeks that ran through the mill site. One of these creeks, Quincy Creek, still runs through the site. The 1917 Sanborn map shows three smokestacks associated with the building. On the north side of the building there was a round, concrete chimney 150 feet tall which still stands at the site and a square, iron chimney 100 feet tall and built on a stone base. There was a round, iron chimney 50 feet tall

[1] Quincy Mining Company Annual Report for 1890.
[2] Hancock, Michigan [map]. 1907. New York: Sanborn Map & Publishing Company; Quincy Mining Company Annual Report for 1891.

on the boiler house's south side. The Sanborn map also shows a "concrete coal bin," 60 feet in diameter, built against the north side of the building's east elevation. The pump house portion of the boiler house contained three pumps with a combined capacity of 13,300 gallons per minute.[3]

A new boiler house and pump house were built to serve the No. 2 mill. The No. 2 mill's boiler house did not generate steam at the same scale as the boiler house for the No. 1 mill. While the No. 2 boiler house only had to provide steam to power the three heads of stamps on the No. 2 mill, the No. 1 boiler house powered five stamp heads in the original mill and provided steam to heat other buildings on the mill property.[4]

Quincy's No. 1 boiler house went out of operation in early October of 1945, along with the No. 1 stamp mill.[5] Traces of the No. 1 boiler house's foundation still remain on the landscape. The facility's most clearly visible remains are the concrete smokestack, the stone base of the 100-foot-tall iron smokestack, and the concrete coal bin labelled on the 1917 Sanborn map. Of the No. 2 boiler house and pump house, far less remains. The most visible extant structural element is a red-brick foundation that was part of the No. 2 pump house. This is located just to the north of Quincy Creek, east of the railroad grade.

Coal Dock/Coal Shed

A map of the Quincy milling works dated 25 September, 1902 shows two docks on the Torch Lake shore at Mason. The first dock runs along approximately 500 feet of shoreline at the southern end of the property. Railroad tracks ran down the middle of this

[3] Hancock, Michigan [map]. 1917. New York: Sanborn Map & Publishing Company.
[4] C.L. Lawton to W.R. Todd. Dec. 2, 1920. QMC, Box 358 Folder 27. MTU.
[5] W.P. Todd to C. J. McKie. Feb. 2, 1946. QMC, Box 364 Folder 82. MTU.

dock. The second dock built at the works was approximately 175 feet long and built almost entirely atop pilings extending into Torch Lake. The map shows what appears to be coal conveying machinery connecting the dock to a wooden structure labelled "coal hoist." The coal hoist is located about 175 feet in from the shore, and 90 feet north of Boiler House No. 2.

A dock was among the first structures Quincy built at Mason in 1888. The initial dock was 200 feet long and 32 feet wide, stretching along the southern shoreline of the mill works property.[6] Quincy extended the dock 100 feet in 1890, and again in 1891, this time adding 200 feet to bring the dock's total length to approximately 500 feet. In 1901, Quincy contracted with American Bridge Company to build a coal unloading and storage plant at the dock. This consisted of three steel coal unloading towers and a sprawling steel coal storage shed 385 feet long and 301 feet wide. This coal shed had a capacity of 4,000 tons.[7]

Quincy built a second dock at Mason in 1899 "together with trestles, coal yard, and the necessary appliances for unloading and handling coal."[8] This equipment presumably allowed Quincy to convey coal from this second dock directly to the boilers in the No. 2 boiler house.

In 1917, Quincy installed equipment that transported coal to both the No. 1 and No. 2 boiler houses. In that year's report to the company shareholders, Lawton reported the machinery "now conveys coal to the crushers and elevates it to a large storage bin from which it is fed to the Taylor stokers. The installation also handles the coal from the No. 2

[6] O'Connell, Charles F., Jr., "Quincy Mining Company: Stamp Mills & Milling Technologies, c. 1860-1931," in HAER No. MI-2, Historic American Engineering Record. 1979. Washington, D.C.: National Park Service, 36.
[7] Quincy Mining Company Annual Report for 1901.
[8] Quincy Mining Company Annual Report for 1899.

boiler plant, and is doing this work satisfactorily."[9] In 1919, Quincy was consuming about 240 tons of coal per day, among its various operations.[10] The overall impression from the documentary record is that Quincy received all of its coal at Mason and distributed it among its mining, milling, and smelting operations by rail. Quincy used anthracite coal at its smelter[11], and most likely to fuel the boilers at the stamp mills. Bituminous coal was used for domestic heating purposes in Quincy's company-owned housing at Mason.

In 1948, Quincy scrapped the coal towers associated with the first dock and its coal shed. The J.H. Green Company was the scrap company that did this work.[12] It is not clear whether the coal shed was also dismantled at this time. There are no remains of the docks or coal handling equipment visible on the landscape today.

Turbine House (Power House)

Located between the No. 1 mill and the No. 2 mill, the turbine/power house at Mason is of interest as a building where electricity was produced. Its construction began in 1919 and the facility was in operation from 1922 until the late 1940s. The turbine/power house's footprint was a square, 48 feet on each side, and the building was approximately 46 feet tall.

Steam provided power for the heavy operations in Quincy's stamp mills, such as stamping ore and pumping water. Steam also drove a generator to provide electricity for motors that powered some of the equipment, such as jigs and Wilfley tables, in the No. 1

[9] Quincy Mining Company Annual Report for 1917.
[10] C. L. Lawton to W. P. Todd. Aug. 14, 1922. QMC, Box 358, Folder 17. MTU.
[11] Ibid.
[12] McKie to W.P. Todd. 8 January, 1947. QMC, Box 364, Folder 31. MTU.

stamp mill. Quincy purchased electricity for the motors in mill No. 2 and other needs from the Houghton County Electric Light Company, an expense the company sought to eliminate.

Company correspondence shows Quincy was investigating the use of a steam turbine to harness exhaust steam from its stamp heads, and use it to generate electricity, as early as 1910. Nothing came of those explorations at that time.[13] Ground preparation for the turbine house began in August of 1919.[14] Correspondence between general manager Charles Lawton and company president W. Parson Todd mentions this excavation included "filling in the creek between the two mills."[15] He may have meant simply rerouting Quincy Creek, which still flows just to the north of mill No. 1. Actual construction of the turbine/power house would not begin for another two years and by the end of December, 1921, the work was progressing slowly, the mill's concrete walls having just been poured.[16]

Quincy purchased the turbine/power house's 2,000-kilowatt turbine and generator from General Electric in June of 1922. The "mixed pressure" steam turbine generated 1,500 kilowatts from low pressure exhaust steam from the mill's stamp heads and 500 kilowatts of high pressure steam directly from the mill's boilers. When the generator plant went into operation in 1923, it resulted in lowered coal consumption at the Mason mill site.[17]

The turbine generator, which depended on exhaust steam from the mill's steam stamps to operate, would have gone out of operation with the closing of the No. 1 mill in the mid- to late 1940s. The turbine/power house building still stands at the site, though none of its equipment remains inside. Though electricity was produced in this building,

[13] QMC. Box 354, Folder 23. MTU.
[14] C. M. Lawton to W.P. Todd. 16 September, 1919. QMC, Box 344, Folder 24. MTU.
[15] Aug. 21, 1919. QMC, Box 344, Folder 24. MTU.
[16] W.P. Todd to C. M. Lawton. Dec. 21, 1922.QMC, Box 358, Folder 38. MTU.
[17] Quincy Mining Company annual reports for 1922 and 1923.

there is no indication transformers were associated with it. PCBs were not likely used at this site.

Turbine House (Power House) Timeline

1919
Site preparation for the installation of a mixed-pressure steam turbine began in September. This included grading the site and filling in a creek that ran between the No. 1 and No. 2 mills.

1922
Quincy began construction of the turbine house late in the year. Work proceeded slowly because of inclement weather.

1923
Quincy completed construction of the turbine house. The building had nearly a square footprint, being 36 feet wide by 38 feet long. The two story building was 45 feet high, its walls made from reinforced concrete and faced with brick. The building housed a 2,000 kilowatt "mixed pressure" steam turbine and generator.

1940s
The turbine building went out of operation in the 1940s with the closing of Quincy's No. 1 mill. The turbine building is still standing, empty of equipment, between the ruins of the No. 1 and No. 2 mills.

Building Information Sheets

1. Quincy Reclamation Dredge

See Reclamation Plant Narrative and Timeline

Significant: Yes, e redge ad il-filled transformers and circuit breakers on board
Alternative (common) names for building: "The redge"

Dates:
1. Built: 943 Original redge); 956 (Second Dredge was bought used from C&H)
2. Modified: nknown
3. Ceased operation: 1956 (Original Dredge sunk); 1967 (Dredge bought from C&H).
4. Structure removed: Original Dredge remains at the bottom of Torch Lake; Second Dredge is still standing

Maps/Plans available:
1. Dredge locations are not generally shown on maps, most likely because the dredge was mobile.
2. There is a collection of Bucyrus Erie dredge blueprints (for the original dredge, which now at the bottom of Torch Lake), bound together into a booklet, n e Quincy ning Company Drawings Collection (MS-012), Drawer 32-B-24, Michigan Tech Archives and Copper Country Historical Collections. The last drawing in this packet shows the location of three transformers that were on board the dredge.

Building narrative:

While construction was under way on Quincy's reclamation plant at Mason, the Bucyrus Erie Company in Milwaukee was assembling the mechanical apparatus for the dredge that would recover stamp sand from Quincy's Torch Lake sand banks for treatment in the new reclamation plant. Roland C. Buck Contractors, based in northern Wisconsin, built the dredge's floating hull and the superstructure surrounding the dredging apparatus. This dredge was very similar in its design and construction to the dredges C&H had used successfully to reclaim its stamp sands at Lake Linden.

The dredge went into operation with the rest of the reclamation plant in November of 1943. During its first decade of operation, the dredge mostly worked on the stamp sand bank left by Quincy's mill No. 1. This deposit was located just to the south of mill No. 1. The dredge was mobile, and Quincy towed it from place to place, in a systematic movement pattern, to recover sands from different parts of the bank. By the early 1950s, the dredge was beginning to work the sand bank from Quincy's mill No. 2. A substantial portion of this bank protruded above the water, and the copper remaining in this sand oxidized, which made this copper difficult to reclaim.

In January of 1956, Quincy's dredge sunk to the bottom of Torch Lake, where it still sits today, marked buy a buoy (divers had investigated the sunk dredge, and determined it was t rth e ost ecover t).

Supporting documents:
1. Quincy Mining Company Annual Reports.

2. Letter from 1952 describing moving dredge to No. 2 mill's tailings pile.[1]
3. May, 1944 reclamation plant electrical inventory. This document gives a list of electrical equipment on board the dredge. It lists five different transformers and a "Oil Blast Circuit Breaker," which contained 6 gallons of oil.[2]
4. Letter from 1956 describing dredge sinking.[3]

Potential Waste and Pollution Concerns:
The dredge was electrically powered and generated no waste of its own. There were transformers and an oil filled circuit breaker on the dredge that sunk to the bottom of Torch Lake. It is likely the dredge currently seen east of State Highway 26 in Mason had similar electrical equipment.

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[1] C.J. McKie to H.J. Hardenberg. 5 November, 1952. Quincy Mining Company Collection (QMC), Box 372, Folder 5. Michigan Tech Archives and Copper Country Historical Collections (MTU).
[2] QMC Box 791, Folder 6, MTU.
[3] C. J. McKie to H.J. Hardenberg. 24 January, 1956. QMC, Box 372, Folder 5. MTU.

2. Shore Plant

See Reclamation Plant Narrative and Timeline

Significant: No
Alternative (common) names for building: None

Dates:
1. Built: 1943
2. Modified: 944
3. Ceased operation: 1967
4. Structure removed: 1970s

Maps/Plans available:
1. C&H Drawing No. 10500. 24 October, 1942. "Shore Plant General Arrangement."[4]
2. C&H Drawing Nos. 10492 & 10493. Map last revised 19 May, 1943 showing complete overview of reclamation plant site.[5]

Building narrative:

The shore plant was built in 1942 and 1943, along with the rest of the reclamation plant at Mason. This structure had belonged to C&H and was disassembled, moved by rail, and e erected t ason.

The shore plant's machinery included a pump for pulling in tailings from the dredge. Its structure included a radial bridge, which carried the dredge pump pipe, and pivoted on a rcular et f ailroad acks n rder ollow the dredge's movement from place to place on the sand banks. A "rubbish screen" prevented detritus the dredge sucked up from entering he shore plant.

The shore plant building itself contained classifying equipment that separated coarse stamp sand from fine slimes. The coarse sand was conveyed to the ball mills in the regrinding plant, while the fine slimes were conveyed separately, directly to the regrinding plant's lotation loor. Quincy built an expansion to the shore plant in late 1944 to accommodate -foot diameter settling tank.

The shore plant's operating life coincided with that of the reclamation plant, in general. The facility was in continuous use except for a few intermittent interruptions when the reclamation operation, as a whole, was idle. The shore plant shut down in 1967 with the rest of the Quincy reclamation plant.

Supporting documents:
1. A package of American Bridge Company blueprints includes a list of materials used in building the Quincy shore plant. C&H dismantled its own shore plant at Lake Linden, and rebuilt it at Mason. A few new materials were necessary, but the building erected at Lake Linden was mostly a reconstruction of C&H's building.[6]

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[4] Calumet and Hecla Mining Companies Drawings Collection (MS 005), Drawer 32 B 23 (Drawer 349, Folder B by C&H's numbering system). MTU.
[5] MS 005, Drawer 32 B 23 (Drawer 349, Folder B by C&H's numbering system). MTU.
[6] MS 005. Drawer 32 B 24 (C&H Drawer 352). MTU.

2. Letter describing addition to the shore plant.[7]
3. Inventory of electrical equipment from May, 1944.[8]
4. Handwritten note describing three transformers "on a 2 Pole Tower near shore plant."[9]
5. C. . Benedict's article on the Quincy reclamation plant Engineering and Mining Journal.[10]
6. Photos showing shore plant construction: pile driving and foundation.[11]

Potential Waste and Pollution Concerns:

There are no pollution concerns directly associated with the activities that took place within the shore plant. Copper bearing sands were transported through this building en route to the regrinding plant. The rubbish screen, located on the lake side of the plant may have served to concentrate detritus the dredge pulled up from the bottom of Torch Lake at this location. There are also three small transformers associated with the shore plant. They were located on an electrical tower outside the building. Archival materials which efer is wer o t escribe ts cation.

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[7] C.L. Lawton to W.P. Todd. 30 November, 1944. QMC, Box 347. MTU.

[8] QMC Box 791, Folder 6, MTU.

[9] No Date. alumet ecla ining ompanies ollection C&H), ox 22, older . TU

[10] C.H. Benedict. "Reclaiming Quincy Tailings from Torch Lake." The Engineering and Mining Journal 45(4). April, 1944. 74 78.s

[11] "Reclamation Plant Construction" photos in Louis Koepell Collection. Catalog No. KEWE 1. Keweenaw National Historical Park Archives. KNHP.

3. Regrinding Plant

See Reclamation Plant Narrative and Timeline

Significant: Yes, e egrinding plant had a substation th **PCB** il-filled transformers in its northwest corner; the regrinding plant ground stamp sand recovered from Torch Lake into fine particles, generating copper bearing, st-reclamation tailings that were re-deposited in Torch Lake; chemicals **xanthate** and **pine oil** were ed xtensively n is plant

Alternative (common) names for building: None

Dates:

1. Built: 1943
5. Modified: 944
6. Ceased operation: 1967
7. Structure removed: 1970s

Maps/Plans available:

1. C&H Drawing No. 10500. 24 October, 1942. "Shore Plant General Arrangement."[12]
2. C&H Drawing Nos. 10492 & 10493. Map last revised 19 May, 1943 showing complete overview of reclamation plant site.[13]
3. C&H Drawing No. T5265296. No date. "Outline: Transformers." Illustrates large outdoor transformers that were part of the regrinding plant's substation.[14]
4. C&H Drawing No. 10528. Nov. 4, 1943. "Quincy Regrinding Plant: Wiring Diagram." Shows wiring scheme for the regrinding plant's electrical system.[15]
5. C&H Drawing 10517. April 5, 1943. "Quincy Regrinding Plant Substation: Floor and Transformer Piers." Shows foundations for substation at the regrinding plant; the structures depicted are still mostly visible on the landscape.[16]
6. Quincy racing o. 0491. uly 1, 942"Quincy grinding Plant: Plant and Longitudinal Sections." Shows floor plan and arrangement of equipment in regrinding plant; location of power ubstation hown.[17]

Building narrative:

The regrinding plant was built in 1942 and 1943, along with the rest of the reclamation plant at Mason. Like the shore plant, this structure had belonged to C&H and was disassembled, moved by rail, and re-erected t ason.

The regrinding facility was the central component of Quincy's reclamation plant. The core operations of reclamation took place within. Reclaimed stamp sand carried by conveyor belt from the shore plant fed from a large "surge" bin at the north end of the

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[12] Calumet and Hecla Mining Companies Drawings Collection (MS 005), Drawer 32 B 23 (Drawer 349, Folder B by C&H's numbering system). MTU.
[13] MS 005, Drawer 32 B 23 (Drawer 349, Folder B by C&H's numbering system). MTU.
[14] MS 005 Drawer 32 B 24 (C & H Drawer 352). MTU.
[15] MS 005 Drawer 32 B 23 (C&H Drawer 349, Folder B). MTU.
[16] MS 005 Drawer 32 B 23 (C&H Drawer 349, Folder B). MTU.
[17] MS 005 **Drawer 32-B-23 (C&H Drawer 349, Folder B). MTU.**

building into a series of Hardinge ball mills which ground the sand into particles fine enough for treatment by flotation (see Reclamation Plant Narrative for full description of the stamp sand reclamation process). Copper mineral generated in the regrinding plant was transported by rail to Quincy's smelter in Hancock, or to other smelter's in the Lake copper district, which melted Quincy's copper on a contract basis. Launders carried the finely ground waste material from the foot of the regrinding plant out into Torch Lake. Quincy re deposited these post-reclamation tailings to the north of the reclamation plant, while continuing to dredge its old stamp sand from the sand banks outh f e acility.

This reclamation operation was essential to Quincy's economic viability in the company's later years. This is shown in the fact that after the federal government withdrew price supports after the end of World War II, Quincy shuttered its mining operations permanently. The reclamation plant was the company's sole source of smeltable mineral for the last 25 years of Quincy operations.

The regrinding plant's operating life coincided with that of the reclamation plant, in general. The facility was in continuous use except for a few intermittent interruptions when the reclamation operation, as a whole, was idle. The regrinding plant shut down in 1967 with the rest of the Quincy reclamation plant.

Supporting documents:

1. Copper Sales ontract between Metals Reserve Company and Quincy Mining Company. 26 June, 1942.[18]
2. C. Lawton to W. P. Todd. 8 November, 1943. Letter describing reclamation plant going into operation.[19]
3. C. . Benedict. "Reclaiming Quincy Tailings from Torch Lake." Article giving depth description of the reclamation plant, with focus on regrinding plant.[20]
4. D. E. Faust to E. R. Lovell. 22 August, 1942. Letter describing disassembly and re-erection of regrinding plant.[21]
5. J. Chynoweth to various. 2 June, 1947. Letter describing Quincy's consumption rate for pine oil.[22]
6. "Reclamation Plant Supplies, 1947-1967." Ledger book containing data related to **xanthate** consumption.[23]

Potential Waste and Pollution Concerns:

Flotation consumed large amounts of the chemicals **xanthate** and **pine oil**, but the chief environmental detriment attributed to the regrinding plant was the fact that it generated millions of tons of tailings (called "post reclamation tailings" in the Reclamation Plant Narrative). This finely ground material still contained significant amounts of copper. The tailings' fine consistently facilitated their spread across the Torch Lake lakebed, and made the copper they contained more bioavailable. The regrinding plant also had a sizeable substation at its northwest corner, with transformers containing **PCB** laden il.

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[18] C&H Box 521, Folder 3. MTU.
[19] Quincy Mining Company Records (QMC). MTU.
[20] *The Engineering and Mining Journal* 145(4). 1944. 74 78.
[21] C&H, Box 521, Folder 7. MTU.
[22] QMC, Box 364, Folder 40. MTU.
[23] QMC, Box 661, Folder 1. MTU.

4. Mill No. 1

See Mills Narrative and mill No. 1 Timeline

Significant: Yes, deposited stamp sands bearing copper and heavy metals in Torch Lake

Alternative (common) names for building: None

Dates:

1. Built: 1889
2. Modified: 1904 - mineral house built at southwest end; 1910 - new launder built; 1918 building xtended astward
3. Ceased operation: 1945
4. Structure removed: Still partially standing, western three quarters are a ruin
5. Last time seen on map/aerial photo: 1949 (Sanborn Map)

Maps/Plans available:

1. Sanborn ire Insurance Maps: 1907, 1917, 1928, 1949 (Update of 1928 Map). MTU.
2. 1902 Quincy Mason Map (QD0092). MS 012, Drawer E 24 C. MTU.
3. 1922 Quincy Mills Map (2818 B). 012, Drawer E 21-A. MTU.
4. 1942 Oxidized Sand Test Map. MS 012, Drawer E 21 B. U.
5. 1953 Mill Sands Map. MS 012, Drawer E 21 B. U.
6. 1954 Mill Sands Cross Sections. MS 012, Drawer E 21 B. U.

Building narrative:

Construction of mill No. 1 began in 1888 and was competed in 1890. The mill went into operation with two stamp heads running; a third stamp head went into operation in 1892. The primary environmental concern with this facility is its output of copper-laden stamp sand into Torch Lake. Ore treatment by flotation was practiced in this facility, using the chemical reagent xanthate beginning in 1930. The mill shut down in 1945 and its ruins are still partially standing at Mason.

Supporting documents:

1. Quincy Mining Company Annual Reports, 1889-1947
2. Historic American Engineering Record report on Quincy Mining Company.[24]
3. Letter describing flotation equipment installation.[25]
4. Letter summarizing equipment upgrades at mill.[26]

Potential Waste and Pollution Concerns:

Over the course of its operational life, Quincy's mill No. 1 deposited millions of tons of stamp sands into Torch Lake. This material contained copper and heavy metals.

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[24] O'Connell, Charles F., Jr., "Quincy Mining Company: Stamp Mills & Milling Technologies, c. 1860 1931," in HAER No. MI 2, Historic American Engineering Record. 1979. Washington, D.C.: National Park Service.

[25] C.M. Lawton to W.P. Todd. 24 November, 1930. QMC, Box 360, Folder 60. MTU.

[26] C.J. McKie to A.M. Mansfield. 23 September 1953. QMC, Box 748, Folder 4. MTU.

5. Boiler House No. 1/Pump House No. 1

See Other Structures Narrative

Significant: Yes, al was burned
Alternative (common) names for building: None

Dates:

1. Built: 1889
2. Modified: rly 1890s addition nstructed n ast ide f e outh levation ouse two more steam boilers
3. Ceased operation: 1945
4. Structure removed: Unknown
5. Last time seen on map/aerial photo: 1949 (Sanborn Map)

Maps/Plans available:

1. Sanborn ire Insurance Maps: 907, 917, 928, 949 Update f 928 Map). U.
2. 1902 Quincy Mason Map (QD0092). MS 012, Drawer E 24 C. MTU.
3. 1922 Quincy Mills Map (2818 B). 012, Drawer E 21-A. MTU.
4. 1942 Oxidized Sand Test Map. MS 012, Drawer E 21 B. U.
5. 1953 Mill Sands Map. 012, Drawer E 21 B. U.
6. 1954 Mill Sands Cross Sections. MS 012, Drawer E 21 B. U.

Building narrative:

Quincy built its first boiler house at Mason concurrently with the No. 1 mill construction, completing the work in 1890. The boilers in this house generated steam to drive the mill's stamp heads and the pumping engine that supplied water to the mill. This pumping engine was located in its own building. The boiler house contained 12 steam boilers, initially, and two more were added in 1891. Quincy's boiler water supply was a pair of creeks that ran through the mill site. One of these creeks, Quincy Creek, still runs through the site. Boiler house No. 1 was the most active of the two boiler houses at the mill site. It supplied steam to power stamps in mill No. 1, and for heating ancillary buildings on the site such as the mill office and carpenter shop. The boiler house ceased operation in 1945, along with Quincy's No. 1 mill.

At the western end of boiler house No. 1, with a wall separating them from the boilers, were the pumping engines that provided water necessary for ore milling in Quincy's No. 1 mill. These pumps were powered by steam from the boilers.

Supporting documents:

1. Quincy Mining Company Annual Reports.
2. Internal report on coal consumption at mill boiler houses.[27]

Potential Waste and Pollution Concerns:

The chief environmental concern associated with boiler house No. 1 is that large amounts of coal were burned there for decades.

[27] QMC, Box 358, Folder 37. MTU.

6. Mill No. 2

See Mills Narrative and Mill No. 2 Timeline

Significant: Yes, as source of stamp sand deposition into Torch Lake
Alternative (common) names for building: None

Dates:
1. Built: 1898 1900
2. Modified: 1918 (addition built on east side of mill)
3. Ceased operation: 1921
4. Structure removed: Late 1940s

Maps/Plans available:
1. Sanborn ire Insurance Maps: 1907, 1917, 1928, 1949 (Update of 1928 Map). MTU.
2. 1902 Quincy Mason Map (QD0092). MS 012, Drawer E 24 C. MTU.
3. 1922 Quincy Mills Map (2818 B). 012, Drawer E 21-A. MTU.
4. 1942 Oxidized Sand Test Map. MS 012, Drawer 21 B. U.

Building narrative:

Quincy's mill No. 2 went into operation in 1900. The mill contained three heads of steam stamps and had its own boiler and pump houses. This mill deposited stamp sands north of the Quincy mill No. 1 stamp sand deposit. Quincy began reclaiming the No. 2 stamp sand deposits in the 1950s, having first focused its attention on the stamp sand deposits from its older mill. The No. 2 mill shut down permanently in 1921, though Quincy still serviced the building wit limited steam for heat and electricity for limited lighting for at least two decades following the closure. Presumably, Quincy kept its older mill in operation, as opposed to the No. 2 mill, because the old mill had five heads of stamps while the No. 2 mill had only three.

Supporting documents:
1. Quincy Mining Company Annual Reports, 1898-1947.
2. Historic American Engineering Record report on Quincy Mining Company.[28]

Potential Waste and Pollution Concerns:

Over the course of its operational life, Quincy's mill No. 2 deposited millions of tons of stamp sands into Torch Lake. This material contained copper and heavy metals.

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[28] O'Connell, Charles F., Jr., "Quincy Mining Company: Stamp Mills & Milling Technologies, c. 1860 1931," in HAER No. MI 2, Historic American Engineering Record. 1979. Washington, D.C.: National Park Service.

7. Boiler House No. 2

See Other Structures Narrative

Significant: Yes, as a facility where coal was burned in large amounts
Alternative (common) names for building: None

Dates:
1. Built: 1898 1900
2. Modified: nknown
3. Ceased operation: 1921
4. Structure removed: Late 1940s

Maps/Plans available:
1. Sanborn ire Insurance Maps: 1907, 1917, 1928, 1949 (Update of 1928 Map). MTU.
2. 1902 Quincy Mason Map (QD0092). MS 012, Drawer E 24 C. MTU.
3. 1953 Mill Sands Map. MS 012, Drawer E 21 B. U.
4. Historic American Engineering Record report on Quincy Mining Company.[29]

Building narrative:

Boiler House No. 2 was built along with Quincy's mill No. 2 at Mason. This boiler house contained five Hawley Downdraft Boilers. It's smokestack was 75 feet tall, made of iron on a stone base. Unlike the boiler house for mill No. 1, which housed pumps in addition to boilers, mill No. 2 had separate buildings for its pumps and boilers. Boiler house No. 2 operated on a smaller scale in comparison with boiler house No. 1. it's primary role was supplying steam to power the three heads of stamps in mill No. 2.

Supporting documents:
1. Quincy Mining Company Annual Reports.
2. Internal eport on coal consumption at mill boiler houses.[30]

Potential Waste and Pollution Concerns:

The chief environmental concern associated with boiler house No. 1 is that large amounts of coal were burned there for decades.

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[29] O'Connell, Charles F., Jr., "Quincy Mining Company: Stamp Mills & Milling Technologies, c. 1860 1931," in HAER No. MI 2, Historic American Engineering Record. 1979. Washington, D.C.: National Park Service.
[30] QMC, Box 358, Folder 37. MTU.

8. Pump House No. 2

See Other Structures Narrative

Significant: No
Alternative (common) names for building: None

Dates:
1. Built: 1898 1900
2. Modified: nknown
3. Ceased operation: 1921
4. Structure removed: Unknown
5. Last time seen on map/aerial photo: 1949 Sanborn Map

Maps/Plans available:
1. Sanborn ire Insurance aps: 1907, 1917, 1928, 1949 (Update of 1928 Map). TU.
2. 1902 Quincy Mason Map (QD0092). MS 012, Drawer E 24 C. MTU.
3. 1942 Oxidized Sand Test Map. MS 012, Drawer E 21 B. U.

Building narrative:

Pump house No. 2 was built starting in 1898 along with mill No. 2 and its boiler house. The pumping engines in this pump house pumped water for the milling process in mill No. 2. This building also housed a small pumping engine that supplied water for fire suppression. A masonry adit seven feet wide, seven and one half feet deep, and 100 feet long connected pump house No. 2 to Torch Lake, providing water to feed the pumps.

Supporting documents:
1. Quincy Mining Company Annual Reports.

Potential Waste and Pollution Concerns:

There re no known aste or pollution concerns associated ith his uilding.

9. Turbine House (Power House)

See Other Structures Narrative

Significant: No
Alternative (common) names for building: None

Dates:
1. Built: 1921
2. Modified: nknown
3. Ceased operation: Late 1940s
4. Structure removed: Still anding

Maps/Plans available:
1. Sanborn ire Insurance Maps: 1928, 1949 (Update of 1928 Map). MTU.
2. 1922 Quincy Mills Map (2818 B). 012, Drawer E 21-A. MTU.

Building narrative:

In an effort to reduce its reliance on the Houghton County Electric Company for power at its mills, Quincy built the turbine house in 1921 to house a 2,000KW mixed pressure steam turbine. Most of the steam that powered the generator was exhaust steam from the No. 1 stamp mill, though some steam from the No. 1 boiler house was also used. This turbine would provide for most of the electrical needs at the mill. While it operated concurrently with the reclamation plant for a time, the reclamation plant got its electricity from &H and not from the turbine house.

Supporting documents:
1. Quincy Mining Company Annual Reports.
2. "Report on Exhaust Steam Turbine for Quincy Mills," internal company document.[31]
3. Correspondence describing site preparation for turbine generating facility. [32]

Potential Waste and Pollution Concerns:

Despite the fact that electricity was produced in this facility, there is non indication transformers or other oil-filled electrical equipment was present.

[31] 28 November, 1921. QMC, Box 354, Folder 37. MTU
[32] C. L. Lawton to W.P. Todd. 16 September, 1919. QMC Box 344, Folder 24. MTU.

10. Coal Shed

See Other Structures Narrative

Significant: Yes, cause al was tored ere n a large cale
Alternative (common) names for building: None

Dates:
1. Built: 1901
2. Modified: 917
3. Ceased operation: Unknown
4. Structure removed: Unknown

Maps/Plans available:
1. Sanborn ire Insurance Maps: 1928, 1949 (Update of 1928 Map). MTU.
2. 1953 Mill Sands Map. MS 012, Drawer E 21 B. U.
3. 1942 Oxidized Sand Test Map. MS 012, Drawer E 21 B. U.
4. 1902 Quincy Mason Map (QD0092). MS 012, Drawer E 24 C. MTU.

Building narrative:

American Bridge Company built the coal dock in 1901 for Quincy Mining Company. The structure was 385 feet long and 301 feet wide. Its storage capacity was 4,000 tons. Associated with the coal shed were three steel coal unloading towers, which unloaded coal from ships docked at the first Quincy dock. In 1917, Quincy added conveying machinery to the mill which distributed coal to both the No. 1 and No. 2 boiler houses. Quincy received all of its coal at Mason and distributed it by rail to its mines and smelter. In 1948, the J.H. Green Company scrapped the three steel coal loading towers associated with the coal dock and shed. There is a structure having the same approximate dimensions as the coal shed on a 1953 map of the Mason shoreline, but it is labelled "coal dock."

Supporting documents:
1. Quincy Mining Company Annual Reports.
2. Letter describing coal consumption.[33]
3. Letter describing scrapping of coal unloading towers.[34]

Potential Waste and Pollution Concerns:

Pollution concerns related to this facility are chiefly related to the large amounts of coal hat ere ored ithin .

[33] C. L. Lawton to W. P. Todd. Aug. 14, 1922. QMC, Box 358, Folder 17. MTU.
[34] McKie to W.P. Todd. 8 January, 1947. QMC, Box 364, Folder 31. MTU.

11. Dock No. 1

See Other Structures Narrative

Significant: No

Alternative (common) names for building: None

Dates:
1. Built: 1888
2. Modified: 891, 901
3. Ceased operation: Unknown
4. Structure removed: Unknown

Maps/Plans available:
1. Sanborn ire Insurance Maps: 1928, 1949 (Update of 1928 Map). TU.
2. 1953 Mill Sands Map. MS 012, Drawer E 21 B. U.
3. 1942 Oxidized Sand Test Map. MS 012, Drawer E 21 B. U.
4. 1902 Quincy Mason Map (QD0092). MS 012, Drawer E 24 C. MTU.

Building narrative:

Dock No. 1 was the first structure Quincy built at Mason, prior to commencing construction of its milling works there. The initial dock was 200 feet long. By end of 1891 Quincy had expanded the dock twice, bringing its length to 500 feet. This dock ran parallel to e hore and ts oundations, n e stern ide, were on land.

Supporting documents:
Quincy Mining Company annual reports.

Potential Waste and Pollution Concerns:

There re no known aste or pollution concerns associated ith his ructure.

12. Dock No. 2

See Other Structures Narrative

Significant: No

Alternative (common) names for building: None

Dates:
1. Built: 1899
2. Modified: nknown
3. Ceased operation: Unknown, most likely prior to 1953
4. Structure removed: Unknown, most likely prior to 1953

Maps/Plans available:
1. Sanborn ire Insurance Maps: 1928, 1949 (Update of 1928 Map). TU.
2. 1953 Mill Sands Map. MS 012, Drawer E 21 B. U.
3. 1942 Oxidized Sand Test Map. MS 012, Drawer E 21 B. U.
4. 1902 Quincy Mason Map (QD0092). MS 012, Drawer E 24 C. MTU.

Building narrative:

Quincy built this dock in 1899 to serve mill No. 2, particularly its boiler house. In contrast to dock No. 1, which had its shore side foundations built on land, this second dock at Mason was built almost entirely on pilings in Torch Lake. From the start, this dock was equipped with equipment to convey coal directly to the No. 2 boiler house. A map dated 15 December, 1953, shows stamp sand deposits where this dock had stood.

Supporting documents:
1. Quincy Mining Company annual reports.

Potential Waste and Pollution Concerns:

There re no known waste r llution oncerns sociated th is tructure.

13. Oil House

Significant: No
Alternative (common) names for building: None

Dates:
1. Built: Unknown
2. Modified: nknown
3. Ceased operation: Unknown
4. Structure removed: Unknown
5. Last time seen on map/aerial photo: 949

Maps/Plans available:
1. Sanborn ire Insurance Maps: 1907, 1917, 1928, 1949 (Update of 1928 Map). MTU.
2. 1902 Quincy Mason Map (QD0092). MS 012, Drawer E 24 C. MTU.

Building narrative:
According to informant EK, this small structure was used to house oil for lubricating machinery. Maps indicate the structure was built into the hillside and was mostly underground.

Supporting documents:
Interview with EK, 14 November, 2014.

Potential Waste and Pollution Concerns:
This uilding contained ls for lubricating machinery and may have contained other chemicals used in the maintenance of machines.

Section 3: Supporting Documentation

Annotated List of Drawings and Blueprints at
Michigan Tech Archives & Copper Country Historical Collections[1]

MS-012: Quincy Drawings Collection

Drawer 30-E15-A

This drawer contains blueprints for misc. castings at the Quincy mill and elsewhere (pipe fittings, etc.) There are also blueprints and a tracing showing different types of machinery, such as a jigging machine and a "mechanical device for removing jig concentrates"

1. July 17, 1912. Drawing showing "proposed Turbine Building" There is also a tracing with a floor plan and front elevation.
   {Scanned with File Name MS012-30-E15-A-QD2762}
2. Aug. 16, 1922. Blueprint showing "Exhaust Steam Piping No. 1 Mill"
3. Aug. 19, 1922. American Bridge Company blueprint showing turbine building, no longer labeled as "proposed." Building's dimensions are 40 feet, north to south, 38 feet east to west, and 48 feet tall.
4. May 9, 1922. Blueprint for a "Truscon Standard Steel Building," a prefabricated building from the Truscon Steel Company in Detroit. It is not clear whether Quincy ever erected such a building and if they did, where they put it up.

Drawer 30-E21-A

This drawer contains numerous maps of Quincy's works at Mason, mostly predating erection of the reclamation plant.

1. Undated. Map on heavy card stock (indicating it was intended for frequent use in the field) shows Coal Dock and No. 1 mill as well as the advancement of the stamp sand shoreline into Torch Lake (latest date added is Sept., 1917). This map is heavily marked with faint, inscrutable pencil notations.
2. Undated. Map showing buildings and shoreline at Mason works, including the No. 2 Mill. Shorelines shown for years 1902, 1910, 1914, 1916, 1917, 1919. There is also a tracing of this map, but without the No. 2 Mill.
3. Undated. Blueprint map showing all buildings at Mason works. The buildings are labeled in red pencil.
4. March 21, 1922. Tracing shows No. 1 and No. 2 mill. An odd circular structure, possibly a smokestack, was noted to the south of the No. 2 mill.
   {Scanned with File Name MS012-30-E21-A-QD0173edited}

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[1] This is a list of all relevant drawings and blueprints found during the course of archival research for the project. Those drawings, maps, and blueprints that will be delivered to the DEQ as digital scans are annotated with the name of the digital file.

Drawer 30-E21-B

This drawer contains a collection of drawings showing the Quincy shoreline. These are interesting because they post-date the construction of the reclamation plant. Many of these drawings appear to be representations of dredging activities on the stamp sand banks. It would be possible to recreate the movements of the dredge based on this spatial data.

1. Undated. Tracing of map predating reclamation plant showing development of stamp sand deposits/evolution of shoreline with tonnages of stamp sand given.
2. Approx. Oct. 1952. This map demarcates portions of the stamp sand bank No. 1 the dredge worked from 1946 to 1952. The last date given is Oct. 1952.
   {Scanned with File Name MS012-30-E21-B-QD1712}
3. Dec. 13, 1954. Map of sand bank development, with cross sections. This is a pretty fascinating drawing, as it shows the sand banks in three dimensions.
   {Scanned with File Name MS012-30-E21-B-QD1729}
4. Dec. 15, 1953. This is a working map of sand bank No. 2, similar to #2 above. Its latest date is May, 1959.
   {Scanned with File Name MS012-30-E21-B-QD0911}

Drawer 30-E23-A

Drawer contains maps mostly relating to Quincy's mine properties. There is one tracing showing sand depositions:

1. March 7, 1940. Drawing No. 2979F. This tracing shows the Mason shoreline and sand deposits. It gives water depths for various locations, including depth of water above submerged stamp sand banks.

Drawer 30-E23-A

This drawer contains various maps of the Mason mills location, especially focusing on railroad tracks. Buildings are mapped in various levels of detail, though usually not greatly detailed.

1. June 17, 1904. This is a tracing of a map showing Quincy's railroad tracks used for carrying mineral to the smelter.
2. Aug. 1, 1888. This tracing of a survey/plat map shows probably the original route of the Torch Lake Railroad company's lines through the Mason location. This map is in two parts.
3. Undated. Drawing of No. 2 mill and surroundings.
4. Undated. Map L-13-B-1. Shows No. 2 Mill and some surrounding structures, including railroad tracks, launders, steam pipes, possibly electrical lines.(Detail; note symbol marked "2,300 volts" just left of center)
5. April 24, 1930. Blueprint relating to highway routing. From the state highway department? Shows mills and railroad lines, power house and roads, pipes and launders.
6. Aug. 4, 1902. Plan of coal track to boiler house, Mill No. 2.(Detail)
7. Oct. 15, 1902. Tracing showing Mill Complex and coal shed/dock. Includes more detail of coal shed than most drawings.

Drawer 30-E24-C

More maps about shorelines and mills (Torch Lake at Mason).

1. Dec. 10, 1941. Map dated by K. Spiroff shows evolution of shoreline at Mason through years of stamp sand deposition. Dates are given for each period of deposition, along with tonnages of stamp sand deposited (figures presumably gleaned from Quincy's own records). This map also shows the arrangement of a series of test holes that were drilled into the sands in order to assess their copper content. A table is provided, showing the copper densities for each test hole.
   {Scanned with File Name MS012-30-E21-B-QD1735}
2. Dec. 10, 1941. Another map showing shoreline evolution.
3. Sept. 25, 1902. Tracing showing mill works. Coal hoist, "Oil House" labeled. Map indicates coal shed was a steel structure as was the "New Mill," its boiler house, and its pumphouse; the old boiler house and oil house were stone; the "Old Mill" (Mill No. 1), the coal hoist, and the blacksmith shop were wooden.
   {Scanned with File Name MS012-30-E24C-QD0092}
4. A second map dated 12/10/1941 by "W.E.B. – K.S." shows mills, coal dock, boiler house, etc. This map has penciled-in sketches of proposed locations for the reclamation operation's shore plant. All are located to the southeast of the mills, on the south side of the stamp sand peninsula.
   Two options are given for plants tying into the company's No. 1 Mill (the older of the two mills):
   - Plan A (southernmost) — requires 1,150 feet of conveyor belt some on trestles or in tunnels; site elevation is 7 feet above lake level; "next costliest"
   - Plan B — Requires 700 feet of conveyor belt; site elevation is 20 feet above lake, "costliest"

   One option is given for a plant tying into the Company's No. 2 Mill (the newer of the two mills)
   - Plan C (Northernmost) — requires 1,400 feet of conveyor belt; site elevation is 15 feet above lake level; notations: "Advantages of #2 Mill: Can be installed without any (illegible) by present work. Tailings will not be run around. Besides when through will have large dump grounds. Will have to elevate tailings in near future."
5. Another version of the map described above has the proposed locations drawn more carefully with colored pencil.

Drawer 30-F13-A

This drawer contains numerous blueprints for Quincy's No. 1 Mill and a few for the No. 2 Mill.

1. Undated. No. 2714-17. Tracing of foundations for rock bins, three stamp heads, and the jigging and washing floor for an addition to Quincy's No. 1 Mill.
2. 1897. No. 2714-17. Plan and elevations for addition to Quincy stamp mill, wood frame construction with a stone foundation.

3. Undated. Blueprint plan view for Stamp Mill No. 2 by F. M. Schubert. Shows three stamp heads and placement of jigs and classifiers ("washing" machinery). The building's dimensions were 132-by-217 feet.
   {Scanned with File Name MS012-F-13A-QD2670}
4. Undated. Torn lower fragment of a drawing showing a sectional elevation of one of the Quincy Mills, showing drive belting and arrangement of machinery.
5. June 29, 1909(?) (Date is very faint, year is either 1904 or 1909, probably 1909). Blueprint showing sectional elevation for an addition to Quincy's No. 1 Mill "Wash Dept." (This refers to the mineral concentration equipment at the end of the milling process, post-stamping and post-jigging).

MS-005: C & H Drawings Collection

Drawer 32-B-23 (C&H Drawer 349, Folder A): More Quincy Reclamation Drawings

This folder contains drawings of pump foundations and of equipment. The following may be of interest:

1. Dec. 12, 1942. No. 10508. Regrinding Plant Floor
2. Aug. 7, 1942. No. 10497. Regrinding Plant Foundation
3. Oct. 24, 1942. No. 10500. Shore Plant General Arrangement
4. A large pack of Bucyrus Erie dredge drawings

Drawer 32-B-23 (C&H Drawer 349, Folder B): More Quincy Reclamation Drawings

This folder contains the following drawings of interest:

1. "Soundings and Dredge Operation" map
2. June 26, 1942 (Revised May 19, 1943) No. 10492. Map showing full Reclamation works (Including "rubbish platform" and "rubbish screen box" to the northeast of the Shore Plant). The plant does not seem to make any use of the No. 1 Mill that is discernible from this map.
3. Oct. 20, 1942. No. 15122. "Quincy Reclamation Plant Electric Circuits One Line Diagram.
4. Nov. 4, 1943. No. 10528. Regrinding Plant Wiring Diagram. There were two transformers on the exterior of the building at the west side of the north elevation. A third transformer was located inside the plant, in the center of the plant's northernmost portion.
   {Scanned With File Name MS005-349-B-23-10528}

5. No. 10508. Good drawing of the regrinding plant floor. This drawing is reproduced as C & H Tracing No. 10491, and the tracing is a lot more legible than this drawing.
6. June 30, 1942. No. 10493. General Arrangement of Reclamation Plant. Shows Regrinding Plant, Conveyor System, Shore Plant. Indicates **Electrical Substation** was located within the Regrinding plant, in the northwest corner of the building.

7. July 21, 1942. No. 10494. Cross-sections of the regrinding plant showing details of equipment placement and orientation.
8. July 21, 1942. No. 10491. Floor plan of Regrinding Plant. Shows location of substation.
   {Scanned With File Name MS005-31-B22-10491}
9. April 15, 1943. No. 10517. Quincy Regrinding Plant Substation. Shows floor plan of substation and transformers' foundation piers (along with elevations of same). Shows Substation in the northwest corner of the Regrinding Plant. Shows cross sections of foundations for substation. Shows floor plan of substation. Shows footprints of the outdoor transformers' foundations, their spatial relationship to the building. Refers to General Electric Drawing T-5265296.
   {Scanned With File Name MS005-349-B-23-10517}

Drawer 32-B-23 (C&H Drawer 350)

This folder contains a few maps, including one that his hand drawn in pencil, showing the Mason works and stamp sand banks. There are also some construction plans and machinery drawings.

Map showing the Quincy dredging grid dated Dec. 29, 1942
Another 1941 map of stamp sand drill tests and their assay data
Map dated Dec. 10, 1941 showing the whole site, pre-reclamation plant: Coal Dock, No. 1 & No. 2 Mill, Boiler House, Offices, Railroad tracks, unmarked buildings
Drawing of Reclamation Plant heating layout
Machinery Drawings: Crane Trolley and tracks, Sand Pumps
Plans for launching the dredge hull
Drawing of the Reclamation Plant "Conveyor Gallery"

Drawer 32-B-24 (C & H Number 351) Quincy Reclamation Plant

This drawer contains packets of blueprints relating to the Quincy Reclamation Plant. Many of these are for plant machinery:

Denver "Sub-A" Flotation Machine
10x4-foot Dorrco Filter
24-foot Dorr Thickener
35-foot Dorr Slime Thickener
66-foot Akins Classifiers
Westinghouse electric motors
Centrifugal Pumps (Ingersoll-Rand)
Allis Chalmers Conical Mill

Drawer 32-B-24 (C & H Drawer 352) "Dredge"

1. Oct. 28, 1942. No. T-5265296. (General Electric) Shows overhead elevation views of the outdoor transformer. The main body of the transformer was 11 feet, 7.5 inches tall. It was rectangular in profile and footprint. Contained 12,500 lbs of oil. Drawing does not indicate how many of these transformers were ordered/installed. Handwriting on the blueprint reads "Quincy Reclamation Plant Substation — Transformers" (note plural).
   {Scanned With File Name MS005-352-32-B-24-T5265296}
2. Oct. 30, 1942. No. PP-6228847 (General Electric). "Metal Clad Switchgear." Shows switchgear layout for Substation switches. Refers to contract for list of materials.
3. No. 237072. Last page of Bucyrus Erie Drawings Package shows locations of transformers on the dredge.
4. A package of American Bridge Co. drawings has a materials list showing what materials were reclaimed from C & H for the construction of the shore plant.

Lists of Archival Records Consulted

CALUMET & HECLA FILES, SEPTEMBER - DECEMBER , 2014			
Michigan Tech Archives & Copper Country Historical Collections, MS-002, Calumet & Hecla Collection			
Series/Description	Box	Folder	Year(s)
4.4.38 (4.3.30) President's Office Alphabetical, A-Z, 1910-1969			
Quincy Mining Co.-Power Contracts	84	9	1946-1966
8.2.5 (8.2.5) Quincy Reclamation Project, 1940-1949 (2 cu.ft.)			
Letter Book-C&H Cons. Co.-Shop Requisitions	128	6	1942-1943
Miscellaneous Data	521	1	1942-1943
Miscellaneous Data	521	2	1942
Proposals, Contracts, etc.	521	3	1942-1949
Miscellaneous Correspondence, etc.	521	004-005	1941-1945
Miscellaneous Company Files, etc.	521	006-008	1942-1949
Government	521	9	1942-1945
Government	522	1	1942-1945
Michigan College of Mining and Technology	522	2	1940 & 1942
Quincy Mining Co. (Engineering Dept.)-Addresses Index	522	3	?
Dredge	522	4	1942-1943
Coal Scow Repairs	522	5	1943
Reports from Hermann Hardware Co.	522	6	1943
Proposals, Blueprints, Corr.	522	007-008	1942-1945
Corr., Blueprints	523	001-008	

QUINCY FILES, SEPTEMBER - DECEMBER , 2014			
Michigan Tech Archives & Copper Country Historical Collections, MS-001, Quincy Mining Company Collection			
Series/Description	Box	Folder	Year(s)
Subseries 2.6 - Correspondence of Lawton Era (27 cu.ft.)			
2.6.3 Lawton Correspondence with New York Office, 1919 - 1922			
re: MacLean Construction Co. and Stamp Mill	344	11	1919
Between Pres (WR Todd), VP (WP Todd) and Lawton re: Stamp Mill	344	13	1920
Between Pres (WR Todd) and Lawton re: Stamp Mill	344	18	1921
Between Pres (WR Todd), VP (WP Todd) and Lawton re: Stamp Mill	344	20	1921
Between Pres (WR Todd), VP (WP Todd) and Lawton re: Stamp Mill	344	24	1919-1922
SubSubSeries 2.6.4 Lawton Correspondence with New York Office, 1926 - 1944			
Between Pres (WR Todd) and Lawton re: Stamp Mill	345	18	1935
2.6.5 Lawton Correspondence with New York Office and other Businesses, 1939 - 1946			
President (WP Todd), Lawton & Businesses	347	1	Feb 1942 - Apr 1942
President (WP Todd), Lawton & Businesses	347	2	May 1942 - Jul 1942
President (WP Todd), Lawton & Businesses	347	3	Aug 1942 - Oct 1942
President (WP Todd), Lawton & Businesses	347	4	Nov 1942 - Mar 1943
President (WP Todd), Lawton & Businesses	347	5	Apr 1943 - Jun 1943
President (WP Todd), Lawton & Businesses	347	6	Jul 1943 - Sep 1943
President (WP Todd), Lawton & Businesses	347	7	Oct 1943 - Dec 1943
President (WP Todd) and Lawton	347	8	Jan 1944 - Mar 1944
President (WP Todd), Lawton & Businesses	347	9	Apr 1944 - Jun 1944
President (WP Todd), Lawton & Businesses	347	10	Jul 1944 - Oct 1944
President (WP Todd), Lawton & Businesses	347	11	Nov 1944 - Dec 1945
President (WP Todd), Lawton & Businesses	347	12	Jan 1945 - Feb 1945
President (WP Todd), Lawton & Businesses	347	13	Mar 1945 - May 1945
President (WP Todd), Lawton & Businesses	347	14	Jun 1945 - Aug 1945
President (WP Todd), Lawton & Businesses	347	15	Sep 1945 - Dec 1945
President (WP Todd), Lawton & Businesses Jan 1	347	16	946 - Jul 1946
2.6.6 Correspondence of Treasurers and Assistant Treasurers, 1905 - 1921			
Coal & Supply	348	7	1918 - 1918
Coal & Supply	348	8	1919 - 1923
Coal & Supply	348	9	1922 - 1924

2.6.9 Lawton Office Files, 1922 - 1938			
Quincy Stamp Sands	363	4	1932
2.6.12 Subject Files, 1904 - 1917			
Boilers	353	7	1905 - 1916
Coal Dock	353	13	1910 - 1916
Correspondence—Pulverizers w/ Supt. Lawton, 1906-1912	353	18	
Turbines	354	21	1909 - 1910
Turbines	354	22	1906 - 1913
Turbines	354	23	1913 - 1915
Waste Sands Contract	355	24	1909 - 1912
Coal	353	30	1906 - 1911
Coal	353	31	1911 - 1916
Coal Supplies	354	37	1921
2.6.14 Subject Files, 1918 - 1925			
Coal and Supplies	358	3	1918 - 1918
Coal and Supplies	358	4	1918 - 1918
Coal and Supplies - Machinery	358	17	1919
Coal, Supplies, and Machinery	358	27	1920
Coal, Powder Supplies	358	37	1922
Electric Power Turbine	358	38	1907, 1921 - 1922
2.6.15 Subject Files, 1926 - 1931			
Coal	360	1	1926
Stamp Mill	360	13	1927
Coal	360	22	1927
Stamp Mill	360	27	1928
Flotation, Stamp Sands, Etc.	360	29	
Coal	360	31	1928
Stamp Mill	360	39	1929
Coal	360	43	1929
Stamp Mill	360	58	1930
Coal	360	62	1930
Stamp Mill	360	78	1931
Coal/Electric Power, 1931	360	82	
Coal/ Electric Power	360	82	1931

2.6.15 Subject Files, 1926 - 1931, Continued			
Stamp Mill: Between Supt (Hayden) and Lawton	363	7	1928 - 1931
2.6.18 Subject Files, 1945 - 1947			
Alphabetical Subjects	364	1-102	1942-1947, some later
Real Estate Taxes--Reclamation	364	47	1944 - 1947
Statistics--Reclamation Plant	364	57	1944
Sprinkler System--Reclamation Plant	364	59	1945
Coal	364	75	1944
Coal	364	76	1945
2.6.15 Subject Files, 1926 - 1931			
Flotation, Stamp Sands	360	29	1928
Flotation, Stamp Sands, Silver	360	41	1929
Flotation, Stamp Sands, Silver	360	60	1930
Flotation, Stamp Sands, Silver	360	80	1931
Flotation, Stamp Sands, Silver	360	96	1932 - 1933
2.6.18 Subject Files, 1945 - 1947			
Ball Mill Lose Time	364	4	1946 - 1947
Electrical Equipment	364	91	1946
Grinding Balls	364	20	1945 - 1946
Subseries 2.7 - Correspondence of McKie and Subsequent Eras			
2.7.1 McKie with New York Office, 1947 – 1957			
President (WP Todd), Gen. Manager (CJ McKie) and Businesses	372	1	Jan 1947 - Dec 1947
President (WP Todd), Gen. Manager (CJ McKie) and Businesses	372	2	Jan 1948 - May 1949
President (WP Todd), Gen. Manager (CJ McKie) and Businesses	372	3	Jun 1949 - Dec 1950
President (WP Todd), Gen Manager (CJ McKie) and Businesses	372	4	Jan 1951 - Dec 1952
President (WP Todd), Gen. Manager (CJ McKie) and Businesses	372	5	Jan 1953 - Aug 1957
2.7.2 Subject Files, 1948-1949			
Insurance -- Reclamation Plant	372	58	1948-1949
Reclamation Inventory Sales	372	59	1948 - 1949
Miscellaneous R	373	75	1950 - 1951
2.7.2 Subject Files, 1948 - 1949			
Grinding Balls	372	55	1948 - 1949
Pine Oil	372	67	1948 - 1949

2.7.3 Subject Files, 1950 - 1951			
Grinding Balls	373	66	1950 - 1951
Coal	373	38	1950 - 1951
2.7.4 Subject Files, 1952 - 1971			
Power	374	20	1954 - 1957
2.7.5 Subject Files, 1950 - 1972			
Coal	375	4	1961 - 1965
Invoices - Portage Coal & Dock Co.	375	69	1970 - 1971
Subseries 3.3 - General Accounting Ledgers, 1852-1971 (16 cu.ft.)			
3.3.2 Michigan Office Records			
Mine Ledger - Reclamation Plant	629		1943 - 1970
Subseries 3.5 - Cost Sheets and Other Cost Data, 1893-1983			
Cost Sheets - Mine, Reclamation	472	8	1943
Cost Sheets - Mine, Reclamation, Smelter	472	9	1944
Cost Sheets - Mine, Reclamation, Smelter	472	10	1945
Cost Sheets - Mine, Reclamation	472	11	1946
Cost Sheets - Mine	472	12	1947
Cost Sheets - Mine, Reclamation, Smelter	472	13	1948
Cost Sheets - Mine, Rec.amation, Smelter	472	14	1949
Cost Sheets - Mine, Reclamation, Smelter	472	15	1950
Cost Sheets - Mine, Reclamation, Smelter	472	16	1951
Cost Sheets - Mine, Reclamation, Smelter	472	17	1952
Cost Sheets - Mine, Reclamation, Smelter	473	1	1953
Cost Sheets - Mine, Reclamation, Smelter	473	2	1954
Cost Sheets - Mine, Reclamation, Smelter	473	3	1955
Cost Sheets - Mine, Reclamation, Smelter	473	4	1956
Cost Sheets - Mine, Reclamation, Smelter	473	5	1957
Cost Sheets - Mine, Reclamation, Smelter	473	6	1958
Cost Sheets - Mine, Reclamation, Smelter	473	7	1959
Cost Sheets - Mine, Reclamation, Smelter	473	8	1960
Cost Sheets - Mine, Reclamation, Smelter	473	9	1961
Cost Sheets - Mine, Reclamation, Smelter	473	10	1962
Cost Sheets - Mine, Reclamation, Smelter	473	11	1963

Subseries 3.5 - Cost Sheets and Other Cost Data, 1893-1983, Continued			
Cost Sheets - Mine, Reclamation, Smelter	473	12	1964
Cost Sheets - Mine, Reclamation, Smelter	474	1	1965
Cost Sheets - Mine, Reclamation, Smelter	474	2	1966
Cost Sheets - Mine, Reclamation, Smelter	474	3	1967
Cost Sheets - Mine, Reclamation, Smelter	474	4	1968
Cost Sheets - Mine, Reclamation, Smelter	474	5	1969 - 1970
Subseries 3.6 - Taxes, Legal Documents, and Insurance Records, 1861-1987			
3.6.1 - Taxes			
State Tax Commission, Reclamation Plant	714	4	1944 - 1946
State Tax Commission, Reclamation Plant	714	5	1947 - 1950
State Tax Commission, Reclamation Plant	714	6	1951 - 1954
State Tax Commission, Reclamation Plant	714	7	1956 - 1966
Subseries 3.7 - Inventory Records, 1888-1943 (2 cu.ft.)			
Mine & Mill Electrical Inventory	676		1924
Coal Book	677	4	1899-1908
Coal	677	5	1906
Coal Analyses	677	6	
Inventory-Quincy Mill Torch Lake	677	7	1890
Inventory-Quincy Stamp Mill	677	8	1899 - 1902
Subseries 3.8 - Supply Records, 1866-1967 (12 cu.ft.)			
Supplies Purchased - Reclamation Plant	661	2	1947 - 1967
Reclamation Plant Inventory	667	3	1943 - 1945
Reclamation Plant Inventory	667	4	1946
Subseries 4.1 - Surface Records, 1862-1945 (4 cu.ft.)			
Quincy dock	743	4	1862 - 1864
Trucking/Shipping Invoices	746	3	Jan 1943 - Aug 1943
Trucking/Shipping Invoices	746	4	Sep 1943 - Oct 1943
Reports -- Installation costs of Steam turbine equipment	747	5	1921 - 1922
Mill Reports from J Hayden to C Lawton	748	1	1919 - 1921
Vulnerability of Quincy Mill to Sabotage and Subversive Activity	748	4	1942
Tonnage and Tailings Reports	748	6	1954

Subseries 4.3 - Stamp Mill Records, 1860-1945 (5.5 cu.ft.)			
Mineral Reports	773	1	1907 - 1913
Mineral Reports	773	2	1905 - 1909
Mass Copper Shipments and Records of Mineral Shipped from Stamp Mill	773	3	1916 - 1917
Mass Copper Shipments and Records of Mineral Shipped from Stamp Mill	773	4	1917 - 1918
Mass Copper Shipments and Records of Mineral Shipped from Stamp Mill	773	5	1919 - 1920
Mass Copper Shipments and Records of Mineral Shipped from Stamp Mill	773	6	1921 - 1922
Mineral Shipment Records	773	7	1915-1919
Mineral Shipment Records	773	8	1919-1922
Mineral Shipment Records	773	9	1923-1927
Mass Copper Shipments	773	10	1919-1931
Mineral Shipment Records (duplicates)	773	11	1918-1925
Mineral Shipment Records (duplicates)	773	12	1926-1931
Mineral Shipments and Smelter Returns	773	13	1937 - 1942
Mineral Shipments - Mine	773	14	1943
Mineral Shipment Records	773	15	1944 - 1945
Mineral Shipments - Mine	773	16	1945
Mill Reports	774	1	1919
Stamp Sands Data	774	2	1940 - 1943
Stamp Mill Reports - Milling, Shipments, Returns	774	3	1941 - 1942
Monthly & Weekly Mill Reports	774	4	1922 - 1923
Ore Dressing Reports	774	5	1911, 1913
Weekly & Monthly Mill Data	774	6	1923
Weekly & Monthly Mill Data	774	7	1924
Weekly Mill Data	774	8	1927 - 1928
Weekly Report of Waste Sands	786	1	1909 - 1913
Reclamation Plant Journal	788		Nov 1943 - Dec 1946
Reclamation Plant Production -- Includes Smelter Figures Jan 1948 - Dec 1965	789		
Mineral Shipments - Reclamation Plant	790	8	1944
Daily Reclamation Statistics	790	1	1961
Daily Reclamation Statistics	790	2	1962
Daily Reclamation Statistics	790	3	1963
Daily Reclamation Statistics	790	4	1964
Daily Reclamation Statistics	790	5	1966

Subseries 4.3 - Stamp Mill Records, 1860-1945 (5.5 cu.ft.), Continued			
Daily Reclamation Statistics	790	6	1967
Mineral Shipments - Reclamation Plant	790	7	1943
Mineral Shipments - Reclamation Plant	790	9	1945
Mineral Shipments - Reclamation Plant	790	10	1946
Subseries 4.5 - Reclamation Plant Records, 1940-1968, Continued			
Mineral Shipments - Reclamation Plant	791	1	1947
Transfers - Reclamation Plant to Smelter	791	2	1959 - 1968
Estimates for Reclamation Work incl. Stamp Sand Assays 1940 - 1944	791	3	
Reclamation Plant File	791	4	1943
Assays - Reclamation	791	5	1944 - 1947, 1954
Reclamation - Electrical Inventory	791	6	May-44
Reclamation Plant Insurance	791	7	1947
Reclamation Plant Insurance	791	8	Oct 1943 - Jan 1945
Invoices - Reclamation Plant	792		1940 - 1948
Index to Orders - Construction of Reclamation Plant	813	1	Aug 1942 - Mar 1944
Orders - Construction of Reclamation Plant (Folios 1-15) Aug 1942 - Mar 1944	813	2	
Orders - Construction of Reclamation Plant (Folios 16-30) Aug 1942 - Mar 1944	813	3	
Orders - Construction of Reclamation Plant (Folios 31-45) Aug 1942 - Mar 1944	813	4	
Orders - Construction of Reclamation Plant (Folios 48-60) Aug 1942 - Mar 1944	813	5	
Orders - Construction of Reclamation Plant (Folios 61-92) Aug 1942 - Mar 1944	813	6	
Orders - Construction of Reclamation Plant (Unnumbered Folios) Aug 1942 - Mar 1944	813	7	
Reclamation Cost Sheet	814	1	1943
Reclamation Cost Sheets	814	2	1945
Reclamation Cost Sheets	814	3	1946
Reclamation Cost Sheets	814	4	1947
Reclamation Plant Estimated Costs	814	5	1946 - 1947
Subseries 6.2 - Distribution of Labor Records, 1915-1971 (8 cu.ft.)			
Distribution of Labor Summaries--Reclamation	186		Nov 1943 - Dec 1950
Distribution of Labor Summaries--Reclamation	187		1951 - 1955
Distribution of Labor Summaries--Reclamation	188		1956 - 1960
Distribution of Labor Summaries--Reclamation	189		1961 - 1965
Distribution of Labor Summaries--Reclamation	190		Jan 1966 - Oct 1971
Daily Labor Distribution--Reclamation	191		Jan 1964 - Dec 1965

Subseries 6.5 - Employee Cards, 1860-1972 (13 cu.ft.)			
6.5.3 Employee Cards -- Later Sets, 1936-1972			
Employee Cards - - Reclamation Plant Workers	313	2	1943 - 1967

Archival Notes

Archival Notes Compilation
From sessions spanning 9/3/2014 to 12/5/2014

NOTES ON QUINCY MINING COMPANY'S RECLAMATION OPERATION

Michigan Tech Archives & Copper Country Historical Collections
MS-001 Quincy Mining Company Records

SubSubSeries 2.6.3 Lawton Correspondence with New York Office, 1919 - 1922

Box 344
Folder 344/011: Correspondence with MacLean Construction re. Stamp Mill, 1919
This folder contains various letters mostly relating to administrative aspects of the construction of an expansion to the mill. There is little of interest here, though the correspondence does corroborate Lawton's brief description of the mill addition given in the 1919 Annual Report.

1. March 1, 919. . L. Lawton to W.P. Todd. Re. Pelleted Concentrate opper ompany. "Inclosed [sic] please find letter under date of the 29th instant, from J. M. Longyear, relative to the copper that was extracted during 1918 from our stamp sands by the Pelleted Concentrate opper ompany."
2. March 0, 919. odd awton. : ovett rocess. "We ave ours f e th nstant enclosing letter from Mr. Lee asking for permission to renew operations on the sands next year." Permission granted.

Box 344
Folder 344/013: Correspondence related to Stamp Mill, 1920
This folder contains more correspondence related to the stamp mill expansion. Again, mostly administrative minutia.

• The expansion brought the number of stamp heads in the mills to 8.

Box 344
Folders 344/018 and 344/020: Correspondence related to Stamp Mill, 1921
These folders contain nothing of interest.

Box 344
Folder 344/024: Correspondence related to Stamp Mill, 1922
This folder contains more administrative minutia relating to the mill's operation in the early 20s. Seems like it was tough going at that time, with a soft market for copper and low tenor in the mine rock. Little of interest. Much of the correspondence in this folder is actually from 1919. Some references to the turbine house are included.

1. Sept. 16, 1919. Lawton to Todd. Re. Turbine. "The fill and grading for the site of the mixed steam turbine are about completed; so also the road, or driveway, up to it. The fill

under the trestle will be filled with ashes and crushed rock from the mine, as the cheaper of the two methods.

2. Aug. 21, 1919. Lawton to Todd. Re. Mixed Pressure Turbine. "Filling in the creek between the two mills is going along rapidly and fairly satisfactorily; but the amount of sandstone ledge at s ing ncountered, I fear s ing event the erection this fall of the turbine ouse."
3. March 1, 1912. "Preliminary Report on Exhaust Steam Turbine-Plant for No. 1 Mill." This report contains a variety of technical minutia related to the then-proposed installation an lectrical nerating rbine to run off the exhaust steam of the stamps in the No. 1 Mill. At the time of this report, there were five stamps operating at the No. 1 mill. It was expected hese could drive a urbine producing 830 horsepower.

SubSubSeries 2.6.4 Lawton Correspondence with New York Office, 1926 - 1944

Box 345
Folder 345/018: Correspondence Re: Stamp Sands, 1935
This correspondence between Lawton and Todd, written during a time when the whole Quincy operation was shut down from the Great Depression, discusses (albeit somewhat tangentially) the possibility of leasing the Quincy stamp sands to a few different firms.

1. July 10, 1935. Lawton to Todd. Letter indicates C & H was one of the parties interested in leasing the Quincy stamp sands. In the letter, Lawton also states Quincy's mill had "high tension power lines connected right up to the Victoria Dam," which is interesting and curious.

SubSubseries 2.6.5 Lawton Correspondence with New York Office and other Businesses, 1939 - 1946

Box 347
Folders 347/001 through 347/016: Correspondence, W.P. Todd with Gen. Manager C.L. Lawton, Feb. 1942 - July 1946
These folders contain correspondence which is mostly related to stamp sands. Letters indicate Quincy was undergoing some kind of discussions with the federal government, related to a reclamation plant, as early as February, 1942. Continuing correspondence chronicles the early years of Reclamation Plant operations.

- Assay tests of stamp sands took place in March of 1942.
- Quincy planning to install regrinding equipment in its No. 1 mill on its own (though with the benefit of government wartime price supports) as late as April 3, 1942.
- 1942 correspondence related to the reclamation plant reflects reticence to get involved with a federal contract for reclaiming stamp sands. Quincy management is concerned that the government contract will destroy its stamp sand assets without sufficiently reimbursing the company, leaving the company with a shaky post-war uture.
- Correspondence from July, 1942 and later comprises discussions of administrative matters related to setting up the reclamation plant.

1. March 1, 942. odd awton. iscusses plan to onsolidate egrinding units n e No. 1 mill for the purpose of stamp sand reclamation. Todd does not anticipate Quincy

will able n mining profitably after the war and federal price subsidies are over. "If the low price for copper should force the closing of all or most of the Lake Mines it would obably ssible ecure labor or e peration f ur egrinding units at much ess han he present age scale."

2. April 13,1942. Lawton to Todd. "For your information I would observe that Mr. Benedict of seems to be unduly interested in what we are planning for the reclamation plant and I am at a loss to understand why his keen interest. Therefore, this etter o you, in a measure, put you on your guard and see if you know, at least be alert, to learn why."
3. **{PDF18}** June 23, 1942. Overseas Metal & Ore Corporation to Quincy Mining Company. Inquiry into whether Quincy "collect(s) e fumes from your operations," asks for samples and analysis and quantity estimates of fumes and/or flue dust, which they want to purchase.
4. Aug. 3, 1942. Todd to Lawton. "We have a letter from Mr. John M. Wagner, Assistant treasurer f e opper Range ompany vising having forwarded eed to Lot , Section 55 33 to you Saturday. Kindly arrange to have this recorded as the right to dump wast tailings upon and in the Lake opposite this piece as included in our recent deed to the Calumet ecla onsolidated opper ompany as trustees."
5. Aug. 5, 1942. Lawton to Todd. Lawton advises against listing any more equipment for war scrap. Company had listed the following: the old No. 2 hoist; the No. 2 stamp mill building and equipment, together with the old 8,000,000 gallon No. 1 pump.
6. April 19,1943. Todd to Lawton. "I have your letter of the 17th instant regarding salamanders at the smelter." Salamanders were apparently some kind of crucible used in smelting. This letter concerns the advisability of trying to recover copper from these salamanders. "I remember very clearly your efforts many years ago to recover the salamanders that were thrown into the lake during Mr. Cooper's time at the Smelter." This referred to Portage Lake and the Quincy smelter at Ripley, but it is at least somewhat a reflection of Quincy's attitudes toward waste disposal.
7. April 26, 1943. Lawton to Todd. Re: **Coal**. etter indicates Quincy rented out its dock space to **coal** vendors. Up to he date of the etter, hey had been renting o a company called William Johnson & Sons, but were considering leasing it out to a different company amar Quandt). Quincy by this time owned the scale house at the **coal** dock. This is the **coal** dock at Mason.
8. July 6, 1943. Ritter Products Corporation to Lawton. Proposes implementing the "Johnson Process" for separating copper out of the Quincy stamp sands. Later correspondence indicates his as a process to high-grade stamp sand before bringing it into the regrinding mill.
9. July 26, 1943. Lawton to Todd. Repair work being done on the Quincy stamp mill.
10. July 23, 1943. Todd to Lawton. References remodeling work being done on the company houses in Mason. This is one of several letters on this subject. The houses were being efurbished or e rkers at the eclamation plant once it opened.
11. Nov. 8, 1943. Lawton to Todd. All six ball mills in the reclamation plant were up and running by this date.
12. October 18, 1943. Todd to Lawton. Re. Reclamation Plant Mineral. "I have your letter of the 15th instant, and am sorry hat e ve iled o dvise you definitely hat the copper Range Smelter is to handle our reclamation mineral. Therefore, have telegraphed ou day n cordance th opy nclosed."

13. October 28, 1945. Lawton to Allis Chalmers Mfg. Co. Lawton inquires into equipment implications of possible future transition to 60-cycle power from Houghton County Electric Light.
14. Oct. 12, 1943. Five of the regrinding mills six ball mills are operational at least on a trial basis.
15. Oct. , 943. awton odd. "Mr. oepel reports hat one of the ig inch horizontal -beams at the reclamation plant buckled yesterday and although not serious it could easily have become so. It will have to be remedied at once."
16. Dec. 4, 1943. Lawton to Todd. No. 1 Head in Mill No. 1 still own.
17. Dec. 10, 1943. Todd to Lawton. Post-reclamation slimes are getting into Quincy's electric pump for the reclamation plant (water pump?), the pump having been located too close to the end of the reclamation plant's slime launder.
18. March , 944. Lawton to General Electric Company. Further inquiries relating to measures necessary for transitioning to 60-cycle power at the reclamation plant.
19. May , 944. awton odd. "Your uggestion at ou uld ke ave e reclamation plant produce 500,000 pounds of copper each month is back again to your old "wishful thinking". As your old dad would say, "all pretty", but does not always be in the cards." Copper production from reclamation plant only sporadically hitting targets.
20. Aug. 28, 1944. Todd to Lawton. Re. Pewabic Stamp Sands. In which Todd advises Lawton to have assay tests performed on the "Franklin-Pewabic" stamp sands for consideration of their possible future reclamation.
21. Aug. 8, 1944. Lawton to Todd. Discussing possible expansion of reclamation plant.
22. Oct. 28, 1944. Lawton to Todd (two letters with same date). Quincy appears to be pursuing plans to add "efficiency equipment" at the reclamation plant, also an addition to the Shore Plant. This includes purchasing some equipment from C . Nothing definite.
23. Oct. 3, 944. awton odd. Inability ecure labor olding back plans nstall concrete foundations, presumably for an expansion of the shore plant.
24. Oct. 3, 1944. Lawton to Todd. Reclamation plant produced 450,000 lbs copper in month of September.
25. Nov. 30, 1944. L to T. Consideration continues on Franklin sands.
26. Nov. 30, 1944. L to T. Expansion of Shore Plant and Reclamation Plant are ongoing.

"Mr. Koepel advises this morning that the steel frames to the addition to the shore plant e all in place and the girts e all in, and they are now putting up the 1 3/4 inch matched siding.

"The utside rk s ll n and ough lowed own ing andicapped e weather, which is of the good solid winter time — snowing, blowing, and better than 6 inches of snow on the ground.

"Inside the main plant the excavation has been finished for the big 35 foot surge tank and ey e w xcavating or e ootings e tanks rected thin e plant.

"The rk n e it s well along and should be completed within a reasonable time in the near future."

Note here "adit" probably does not refer to a mine adit, but something to do with the reclamation plant. An "adit" had been referenced in previous letters discussing slime intrusion into the reclamation plant water pump.

27. Nov. 27, 1944. T to L. Re: Franklin Sands. More discussion of assay tests on Franklin and Pewabic sands, this time of results. There was a Franklin mill and its stamp sands are e ubject f ese iscussions.
28. Jan. 10, 1945. L to T. Letter giving "resume" report of new installations at reclamation plant. Gives outline of equipment installations, building expansions, and costs associated therewith. "Adit" is defined here as the water intake for the main pumping plant, which was extended 300 feet, presumably to eliminate unintended slime intake into the pumps. **{PDF20}**
29. Jan. 19, 1945. T to L. Re: Silver. In which Todd inquires into the profitability of silver "picking" at the stamp mill, a practice Quincy had apparently been engaged in for some time. "As you know our mill wages have advanced $2.59 per shift without any advance in the price of silver; therefore, possibly the men are not making their wages from this operation."
30. Feb. 1, 1945. L to Franklin G. Pardee, State Appraiser of Mines. Letter sent with another "resume" statement of the reclamation plant and mill. Contains description of the mill's equipment and some useful history. **{PDF21}**
31. Mar. 31, 1945. L to T. With regard to Franklin stamp sands, "there is not enough tonnage ere warrant rking."
32. April 18, 1945. L to T. Remaining stamp sands deposits estimated to contain 50 million lbs of recoverable copper.
33. May 31, 1945. Morris Machine Works to Lawton. Letter proposing method for increasing pacity of dredge.
34. May 31, 1945. L to T. "The new additional equipment that has been in process of installation since the beginning of the year is almost completed and is largely in operation nd now getting into rides."
35. Aug. 10, 1945. L to T. Discussing shutdown of Quincy mine. Lawton advocates leaving the mine equipment in a condition conducive to resuming operations at a later date.
36. July 31, 1945. R. C. Buck to Lawton. Relates to Quincy's desire to build a lean to addition at the south end of the reclamation ant. uck ys he does not ve crew free to do the work. Previous letter from Lawton indicates this addition would house increased machine shop, blacksmith shop, and carpenter shop.
37. General Observation: As 1945 wears on and WWII winds down, Quincy is becoming increasingly cautious in expectation that the government will not renew its copper contract with the company. Todd advises against new equipment acquisitions, etc. Advises "scramming" from the Quincy Mines quickly, while the Metals Reserve Company contract is still in place.
38. Nov. 21, 1945. L. Koepel to Lawton. Letter accompanying metallurgical data relating to reclamation plant operations. His conclusion from the data: "The production of copper depends on the following factors: Amount of slime onnage; Copper content of fee; Copper content of tailings. All three factors dependent on where the dredge is located in the tailings bank." Koepel ndicates opper oduction s igher th a higher oportion of slimes coming into the plant, since slimes require less processing.
39. Nov. 14, 1945. L. G. Koepel to Lawton. Reports dredge has moved to a different portion the sand bank where there was a lot of and above water. The sand was therefore oxidized. Oxidized copper was more challenging for Quincy o process in the

reclamation plant. Koepel reports on a new method being tried: "In November a new **reagent (Sodium Sulphide)** recommended by the Mining School and used by the copper Range Co. was tried in the number three flotation machine, but to date not improvement has been noticed. This reagent is being used to **sulphidize the oxide copper** and then float same with the usual reagents, **Xanthate** and **pine oil**. urther testing s one th **Sodium Sulphide.**

40. Sept. 15, 1945. Lawton to Todd. Quincy selling equipment from its mine operations. Has already sold underground power shovels to Copper Range Copper ompany.

SubSubSeries2.6.6 Correspondence of Treasurers and Assistant Treasurers, 1905 - 1921

Box 348
Folders 348/007 - 348/009: Coal and Supply, 1918 - 1924
These folders contain mostly clerical correspondence related to ***coal*** *purchasing: requests for checks for payment, bills of lading, etc. Several short pieces of correspondence reference Anthracite* ***Coal****. On the whole, the folders are not especially illuminating.*

SubSubSeries 2.6.9 Lawton Office Files, 1922 - 1938

Box 363
Folder 363/004: Quincy Stamp Sands
This folder contains only some limited correspondence related to an inquiry to lease Quincy's stamp sands. Reference is made to new technological developments, or at least the development of a new machine.

SubSubSeries 2.6.12 Subject Files, 1904 - 1917

Box 353
Folder 353/007: Boilers, 1905-1916
This folder contains nothing of interest (Correspondence with minutia related to boilers).

Box 353
Folder 353/013: Coal Dock, 1910-1913
This folder contains correspondence related to the coal dock, mostly between managers and outside companies relating to dump buckets and other equipment for the coal loading tower at the coal dock. Not of much use.

Box 353
Folder 353/018: Correspondence—Pulverizers w/ Supt. Lawton, 1906-1912
This folder contains correspondence relating to ore pulverizers.

Box 354
Folders 354/021-354/023: Turbines, 1909-1915
Folders contain correspondence indicating Quincy was investigating steam turbine electrical generators for its mills as early as 1910. No action seems to have been taken as of 1915.

Box 354
Folder 354/037: Coal Supplies, 1921
This folder contains the usual correspondence with coal companies, etc., related to coal supply. There is also correspondence relating to a then-proposed turbine plant at the mill.

1. Nov. 28, 1921. Report on "Exhaust Steam Turbine for Quincy Stamp Mills. Quincy investigating possibility of installing urbine power generator. ill No. 1 is in operation. No. 2 is idle. No. 1 Mill has four 20"x24" simple stamps and one 24"x24" simple stamp generating exhaust steam. There are three stamp heads in the No. 2 Mill, but ese e dle, f ourse.

Box 355
Folder 355/024
This folder contains an extended exchange of correspondence internal and external to the Quincy Mining Company relating to the leasing of stamp sands at Quincy's former Franklin Mill site, as well as its stamp sands in Torch Lake, to outside interests. The last letter in the series:

1. Nov. 20, 1912. C. Lawton to W.P. Todd. "Answering your favor of the 16th inst., with regard to renewing the lease on our tailing sands to Mr. Livingstone Whitney: I would advise at stpone ecision or a while. I do t lieve at . itney, r whomever he represents, can handle our tailings to advantage, unless he should again represent the Peck Concentrator ompany." So it appears Quincy had leased its stamp sands to an outside concern, but no reclamation activity resulted in this instance.

SubSubSeries 2.6.14: Subject Files, 1918-1925

Box 358
Folder 358/017: Coal and Supplies — Machinery, 1919
This folder contains more correspondence related to coal shipments and coal assays. It seems the arrival of each steamer occasioned the writing of a letter from Lawton to Todd.

1. Aug. 25, 1919. Lawton to Todd. Re. Coal Shed. "The coal shed at the present time has room to store about four thousand tons. From this you can figure about the quantity that the coal shed can care for at any time, figuring our consumption roughly on a basis of 240 tons per day, in addition to this four thousand tons capacity."

Box 358
Folder 358/017: Coal, Supplies & Machinery, 1920
This folder contains more correspondence related to coal supply. Letters indicate Quincy was using both anthracite and bituminous coal, but no indication is given as to which kind was used for what purpose.

1. Dec. 2, 1920. Lawton to Todd. Letter describing steam production and distribution at the mills complex. **{PDF33}**

Box 358
Folder 358/037: Coal, Powder Supplies, 1922
More correspondence about coal supply.
1. Aug. 14, 1922. Lawton to Todd. Re. Anthracite coal. Letter indicates smelter used anthracite al.
2. Aug. 14, 1922. Lawton to Todd. Re. Bituminous coal. This letter deals with domestic coal supply, indicating bituminous coal may have been burned in Quincy's company-owned houses.

Coal Consumption, 1922		
	Stamp Mill	
Boiler House	No. 1	No. 2
January	2359	441
February	2326	422
March	2399	428
April	2173	386
May	2010	312
June	1858	288
July	1582	260
August	1686	299
September	1595	258

Box 358
Folder 358/38: Electric Power Turbine, 1907, 1921-1922
The turbine building is under construction. Progress is slow because the construction got started late in the year.
1. Dec. 21, 1922. Todd to Lawton. "In some way we secured the idea from your former letters at all the oncrete ad en ured th e xception f e oof, and w regret to note that we were mistaken and that there is still considerable concrete to be pouted and ust the weather will moderate sufficiently at an early date to allow the completion of this building.

"We are sorry to note that only a small part of the piping between the Mill and Turbine Building has been installed and from your letter we would assume that some of the

material as t et en eceived…we oped at is rk uld oceed o e e turbine uld n peration e nd f ebruary."
2. Undated. Cost estimate for steam turbine generator at stamp mills. Plan calls for 2,000 KW urbine.

SubSubSeries 2.6.15 Subject Files, 1926-1931

Box 360
Folder 360/013: Stamp Mill, 1927
This folder contains nothing of interest.

Box 360
Folder 360/027: Stamp Mill, 1928
This folder contains nothing of interest.

Box 360
Folder 360/027: Stamp Mill, 1928
This folder contains correspondence related to proposed upgrades at the Smelter. Quincy is in the early stages of equipping the mill with ball mills.

Box 360
Folder 360/029: Flotation, Stamp Sands, Etc.
This folder contains correspondence relating to a test that was done for treating Quincy's stamp sands on a Fahrenwald flotation machine. There is correspondence discussing requests Quincy received from different company's to lease its stamp sands. It does not appear this was carried out.

Box 360
Folder 360/039: Stamp Mill, 1929
This folder contains nothing of interest.

Box 360
Folder 360/041: Flotation, Stamp Sands, Etc., 1929
This folder contains correspondence relating to Quincy's early steps toward outfitting its mill with flotation equipment.

Box 360
Folder 360/058: Stamp Mill, 1930
This folder contains nothing of interest.

Box 360
Folder 360/060: Flotation, Stamp Sands, Silver, 1930
This folder contains more correspondence relating to Quincy's outfitting its mill with flotation equipment.

1. Nov. 24, 1930. C. Lawton W. P. odd. he w 2 ell ahrenwald Spokane lotation machine was put into commission early last week, and has been shoing up very

satisfactorily, except that it seems to be requiring more electrical than was advised and we, erefore, xpected.

Box 360
Folder 360/078: Stamp Mill, 1931
This folder contains nothing of interest.

Box 360
Folder 360/082: Coal/Electric Power, 1931
This folder contains nothing of interest.

Box 360
Folder 360/096: Flotation, Stamp Sands, Silver, 1932-1933
This folder contains little of interest. More of the same talk about leasing out the stamp sands and successful results of Fahrenwald flotation tests.

SubSubSeries 2.6.16: Subject Files, 1932-1935

Box 360
Folders 360/012, 360/032, 360/045: Boilers, 1927, 1928, 1929
These folders contain letters relating to boilers at the mine shafts.

SubSubSeries 2.6.18 Subject Files, 1945 - 1947

Box 364
Folder 364/004 Ball Mill Loss Time, 1946-47
This folder contains reports of lost time in the ball mills' operation in the Reclamation plant during the time period specified. Example:

Table

July 1946	
Repairs	110 hours
Allis Chalmers Liners installed in #4 Mill	101
Power	36
Insufficient Feed	341
Total	588 hours

Box 364
Folder 364/005 Reclamation Plant Boiler Inspection Reports 1945 and 1948
This folder contains reports from the Hartford Steam Boiler Inspection and Insurance Company for 9/11/1945 and 7/15/1948.
1. 1945 Report: "Heavy adhering scale was observed on the arch tubes. The scale in the tubes f f uch ickness that it should be removed mechanically be means of a turbine cleaner.
"The condition outlines was discussed with Mr. Hauswirth, Foreman at the time of inspection nd e understand ill receive proper attention."
2. No problems reported in 1948.

Box 364
Folder 364/007 Misc. B
Folder contains various correspondence. This piece relates to a planned expansion of the reclamation plant:
1. December 3, 1945, R. C. Buck to C.L. Laughton [sic]. "Not having hear from you since Sept. 21, I assume that you have decided o delay the construction of addition to the Mason plant for housing shop until later date." The letter mentions enclosed drawings 1295-1 showing extension's foundations.

Box 364
Folder 364/008 Claims, 1947
This folder contains nothing of interest.

Box 364
Folder 364/009 Calumet & Hecla Company
This contains correspondence between Quincy and C & H dating to 1946 and 1947. Some of the letters relate to exchanges of materials between the two companies. Examples:
1. August, 1946. Credit Memo, C o uincy. uincy charged for: 165 gal. No. 11 **Pine Oil**; 50lbs "Flg Steel Pl." Credited for 7,260 lbs Nihard Scrap (likely ball mill liners and milling balls), 1.88 tons scrap iron, 4.45 tons scrap iron.
2. May 2, 1947. G. L. Craig (C & H) to Quincy Mining Company. "During the past six months we have supplied you with approximately 27,000 pounds of Ni-Hard mill liners having special design features." Exact figure given was 26,942 pounds. Letter relates to C & H finding out the Ni Hard liner design had already been patented by another company, and a six percent royalty would have to be added to future orders.

Box 364
Folder 364/010 Estimated Costs, 1943
This folder contains ledger sheets with estimated costs and some actual costs for the Reclamation Plant during its first months of operation. The reclamation plant went into operation in November of 1943. Cost estimates are listed for Grinding Balls, Ball Mill Liners, ***Reagents****, Fuel.*

Box 364
Folder 364/011 Cost Sheets
This folder contains cover letters sent with the cost sheets mentioned previously.

Box 364
Folder 364/012 Misc. C, 1944-1947
This folder contains nothing of interest.

Box 364
Folder 364/013 Dredge Sleeves
This folder was skipped.

Box 364
Folder 364/014 Misc. D
This folder contains varied correspondence, some referring to expansion of the reclamation plant.

1. Sept. 29, 1947. C.T. DeHaas to R. D. Blackburn. "It occurred to me that in your contemplated work of enlarging your reclamation plant that you might require some new second hand or reconditioned motors."
2. Oct. 5, 944. eHaas Blackburn, eferences rawing 212 8, relating to a 35 foot diameter tank.
3. April 18, 1947. Credit invoice from E.L. DuPont de Nemours & ompany, Grasselli Chemicals Department, for return deposit on one "Empty Coml. arboy." wo arboys were sent back Aug. 27, 1946.

Box 364
Folder 364/015 Misc. E
This folder contains nothing of interest.

Box 364
Folder 364/016 Fire Inspection Report, 1944
Report indicates Quincy has stocks of "Ore bearing sand" and "copper concentrate" on hand. Nothing else of interest.

Box 364
Folder 364/017 Fire Protection
This folder contains nothing of interest.

Box 364
Folder 364/018 Forms
This folder contains mock-ups of book-keeping forms to be sent to a job printing shop for reproduction.

Box 364
Folder 364/019 Misc. E
This folder contains nothing of interest.

Box 364
Folder 364/020 Grinding Balls 1945
This folder contains nothing of interest.

Box 364
Folder 364/021 Government Forms
This folder contains nothing of interest.

Box 364
Folder 364/022 Misc. G
This folder contains nothing of interest.

Box 364
Folder 364/023 Misc. H
*This folder contains a few invoices for **pine oil** purchases from Hercules Powder Company, which give an indication of the volume of **pine oil** used. Examples:*
On May , 945, 6,880 lbs f **pine oil** was elivered tank car.
On Oct. 5, 945, 1,400 lbs f **pine oil** was elivered tank car.
It is not certain whether these deliveries were consecutive.

Box 364
Folder 364/024 Insurance 1945
This folder contains nothing of interest.

Box 364
Folder 364/025 Insurance 1945
Folder skipped.

Box 364
Folder 364/026 Inventory Sales 1946-1947
This folder contains a few scattershot invoices.
1. Dec. 13, 1947. DuPont invoice indicates car boys, presumably used to purchase chemicals from that company, were 6.5 gallons in size.
2. Dec. 13, 1947. Invoice charging Cook & Riley Inc. of Chicago for freight on 675 lbs of **"colored waste."** Attached note reads "Shipment was made F.O.B. Houghton ounty."

Box 364
Folder 364/027 Misc. J
This folder contains nothing of interest.

Box 364
Folder 364/028
This folder contains nothing of interest.

Box 364
Folder 364/029 Loomis, Suffern, & Fernald
This folder contains nothing of interest.

Box 364
Folder 364/030 Misc. L
Quincy investigated provisioning some Army surplus raincoats for employees who wanted to order them.

Box 364
Folder 364/031 C.J. McKie 1946-1949
This folder contains correspondence between C.J. McKie and various including W.P. Todd, C & H's E.R. Lovell, and various suppliers/contractors. Some letters bearing on the Reclamation Plant are outlined below.

1. Dec. 20, 1946. McKie to A.F. Zalk, Duluth Iron & Metal Co. "We have decided to scrap the three **coal** hoisting towers at our Stamp Mill **Coal Dock** this nter. hese wers e located at Mason n orch ake. ll glad ave ur d." uture tters indicate removal of these towers was desired by February of 1947.
2. Jan. 7, 1947. McKie to W.P. Todd. "We are getting plenty of sand to shore plant by running the dredge three shifts."
3. Jan. 8, 1947. McKie to Todd. "Green started a wrecking ew on the unloading towers last Saturday morning." Also: "We have been short-sighted at the Reclamation Plant in our supply of pontoons. This was on account of the uncertainty as to the life of the C & H Reclamation Operations. It was thought that they would be through long ago and that we would able t eir ntoons."
4. Letters dating Dec. 23, 1946 to April 6, 1948 concern the sale of a 2,000 KW General Electric Turbine Generator.

Box 364
Folder 364/032 Mineral Range Railroad
This folder contains nothing of interest.

Box 364
Folder 364/033 Morris Machine Works
This folder contains nothing of interest.

Box 364
Folder 364/034 Motors
This folder contains nothing of interest.

Box 364
Folder 364/035 Mis. M
This folder contains a few items bearing on the Reclamation Plant operations.
1. Aug. 24, 1944. Moloney Electric Company to Quincy. Solicitation to sell **Transformers**, specifically "standard oil-immersed, self-cooled **transformers**."
2. Aug. 21, 1947. Minnesota and Ontario Paper Company to Quincy. "As per our communication of July 28, we are forwarding today, by prepaid express, a two-pound sample of **dried sulfite liquor solids**."

Box 364
Folder 364/036 Notices
This folder contains nothing of interest.

Box 364
Folder 364/037 Misc N
This folder contains nothing of interest.

Box 364
Folder 364/038 Misc. O
This folder contains nothing of interest.

Box 364
Folder 364/040 Pine Oil
This folder contains a letter J. Chynoweth sent to various suppliers, along with their replies.
1. June 2, 1947. J. Chynoweth to various. "We use approximately four tank cars of **Pine Oil** (Steam Distilled) a year and are looking for a source of supply."

Box 364
Folder 364/041 Pipes and Pontoons
This folder contains nothing of interest.

Box 364
Folder 364/042 Power Correspondence
This folder contains a few letters and sales brochures dating from May, 1945 to July, 1947 which indicate Quincy had an interest in increasing its power generating capacity at the Reclamation Plant. No indication of action taken in this regard.

Box 364
Folder 364/043 Preference Rating
This folder contains nothing of interest.

Box 364
Folder 364/044 Pumps
This folder contains nothing of interest.

Box 364
Folder 364/045 Misc. P
This folder contains nothing of interest. (Mostly material relating to electrical motors)

Box 364
Folder 364/046 Quincy Mining Company New York
This folder contains nothing of interest. (Accounting details)

Box 364
Folder 364/047 Real Estate Taxes, Reclamation
This folder contains nothing of interest.

Box 364
Folder 364/048 Rotary Dryer
1. Sept. 18, 1947. J. hynoweth to Moorhead Machinery and Boiler o.
"We e nterested n an electrically perated tationary ryer ed n rying opper concentrates before shipment to Smelter. The percentage of moisture from the feed to dryer will be from ten to twelve percent which we wish to reduce to five or six percent and with a capacity of at least 1.5 tons of wet material per hour. Screen size of material is minus 200 mesh. The weight of the concentrate as discharged from the filter (feed to dryers)is 85.66 pounds per cubic foot. The type of our material is native copper, 46 percent. **Fuel oil** to urnish eat ryer."

Box 364
Folder 364/049 Mis. R
This folder contains nothing of interest.

Box 364
Folder 364/050 Sales of Material
Most material sales are scrap iron. A lot of the scrap iron is spent ball mill liners.

Box 364
Folder 364/051 Smelting Returns, 1943
This folder contains nothing of interest.

Box 364
Folder 364/052 Smelting Returns, 1944
This folder contains nothing of interest.

Box 364
Folder 364/053 Smelting Returns, 1945
This folder contains nothing of interest.

Box 364
Folder 364/054 Smelting Returns, 1946
This folder contains nothing of interest.

Box 364
Folder 364/055
Used figures from the 1947 Smelter reports, which, incidentally, are from the C & H Smelter, to correct calculation of copper redeposited in Torch Lake following reclamation (see table below). During 1947, copper content in the mineral sent for smelting ranged from a low of 28.9 percent to a high of 53.86 percent, but generally the content fell somewhere between 40 and 50 percent. For making the table below, 45 percent was the figure used for estimating copper content of material sent to the smelter. This was used to calculate the total weight of material that went to the smelter per year, which was subtracted from the total weight of sands treated, to achieve an estimate of the weight of stamp sands redeposited post reclamation.

Table __

Quincy Reclamation Production Figures						
Year	Tons Treated	Copper Produced (Pounds)	Pounds Copper per Ton of Sand	Pounds Copper/ Ton post-Rec. Tailings	Redeposited Copper (Pounds)	Corrected Redeposited Copper (Pounds)
1943	167,210	702,270	4.2	2.45	409,664.50	406,892.48
1944	1,124,001	5,879,735	5.2	2.93	3,293,322.93	3,265,567.31
1945	1087515	6066700	5.58	2.18	2,370,782.70	2,349,475.10
1946	1,006,415	5,205,386	5.02	2.3	2,314,754.50	2,295,465.65
1947	1098408	4750895	4.33	2.07	2,273,704.56	2,257,860.33
1948	1,096,124	5,299,956	4.84	1.93	2,115,519.32	2,099,039.40
1949	1,057,310	5,808,136	5.49	1.81	1,913,731.10	1,896,793.93
1950	1,006,355	5,826,510	5.79	2.09	2,103,281.95	2,083,662.80
1951	973,865	5,779,918	5.93	1.67	1,626,354.55	1,610,803.36
1952	995,891	5,007,745	5.03	1.86	1,852,357.26	1,837,350.72
1953	884,297	4,416,643	4.99	2.01	1,777,436.97	1,763,134.41
1954	917,895	4,321,253	4.71	1.83	1,679,747.85	1,667,007.36

1955	898,015	4,727,211	5.27	1.85	1,661,327.75	1,647,238.03
9156	988,041	4,906,713	4.97	1.84	1,817,995.44	1,803,449.76
1957	950,873	4,499,850	4.73	2.1	1,996,833.30	1,981,608.81
1958	162,111	708,640	4.37	2.36	382,581.96	379,887.55
1959	846,474	4,042,542	4.77	1.93	1,633,694.82	1,621,124.76
1960	842,465	3,247,917	3.85	2.07	1,743,902.55	1,733,070.75
1961	901,548	3,486,265	3.87	2.05	1,848,173.40	1,836,659.04
1962	628,639	2,478,858	3.94	2.27	1,427,010.53	1,417,944.80
1963	899,555	3,840,510	4.27	2.13	1,916,052.15	1,902,872.80
1964	919,413	3,837,407	4.17	2.37	2,179,008.81	2,164,356.31
1965	667,484	2,699,119	4.04	1.99	1,328,293.16	1,319,639.48
1966	770,205	3,205,710	4.16	2.41	1,856,194.05	1,843,746.99
1967	206,351	336,707	1.63	1.74	359,050.74	358,106.84
1968	No Production (Plant Idle)					
1969						
1970						
TOTALS	21,096,460	101,082,596			43,880,777	43,542,759

Box 364
Folder 364/056: Smelter Returns, 1948.
This folder's contents missing as of April 24, 2013.

Box 364
Folder 364/057: Statistics — Reclamation, 1944-1946
This folder contains production data related to the Quincy Reclamation Plant. Most of it repeats data from metallurgical reports found elsewhere and recorded in the table above.

1. Dec. 12, 1944. C. L. Lawton to W.P. Todd. Letter providing further evidence Quincy's initial production was not meeting expectations/projections.

Box 364
Folder 364/058: Spraying Machine, 1945
In which Quincy Mining Company attempts to procure a sprayer for painting (presumably the dredge and other buildings at Reclamation).

Box 364
Folder 364/059: Sprinkler System — Reclamation, 1945
This folder contains nothing of interest.

Box 364
Folder 364/060: Misc. S
This folder contains nothing of interest.

Box 364
Folder 364/061: Social Security
This folder contains nothing of interest (Payroll accounting data).

Box 364
Folder 364/062: Reclamation Tractor, 1945
Correspondence with War Production Board relating to failed attempt to secure a Caterpillar D-2 bulldozer.

Box 364
Folder 364/063: Trucks, 1943
This folder contains nothing of interest.

Box 364
Folder 364/064: Tractors
This folder contains nothing of interest (sales brochures).

Box 364
Folder 364/065: Misc. T
This folder contains nothing of interest.

Box 364
Folder 364/066: Upper Michigan Broadcasting Company
This folder contains nothing of interest (Corr. regarding lease for broadcasting tower).

Box 364
Folder 364/067: Valuation Assessed (Mine & Reclamation), 1945
This folder contains nothing of interest.

Box 364
Folder 364/068: Misc. U, V
This folder contains nothing of interest.

Box 364
Folder 364/069: Misc. W
Contains correspondence between Quincy and the Westinghouse Electric & Manufacturing Company.
1. July 25, 1944. T. T. Bakke (Westinghouse) to R. D. Blackburn. Quincy to send transformer for repairs. Bakke recommends against Quincy's plan of "shipping the transformer without e tank." The ansformer in question is a 150 KVA transformer.
2. Aug. 13, 1946. T. T. Bakke to John Chynoweth. Quote for repairing a 10 KVA (2300-230/460 volts, style 26425) and a 25 KVA transformer (2300-115/20 volts, Type H, Form K (General Electric)). "Net price for rewinding, including the oil, will be $135.40.

Box 364
Folder 364/070: Misc. A, 1946
This folder contains nothing of interest.

Box 364
Folder 364/071: Atlas Powder Co., 1945
This folder contains nothing of interest (Return slips for fuses and "Giant Gelatin," 40% and 60%).

Box 364
Folder 364/072: Boiler Inspection Report, 1945-1946
This folder contains inspection reports for steam boilers, including locomotive steam boilers.
1. May 4, 1946. Report of Inspection for steam boiler at Stamp Mill No. 1 indicates five boilers at the mill were "out of service for some time."
2. Sept. 4, 1946. Report of Inspection indicates the same five boilers "are out of service and may not be used for some time."

Box 364
Folder 364/073: Brodeur, 1947
Contains a solicitation from the Brodeur Insurance Agency regarding the sale of Quincy's smelter site.

Box 364
Folder 364/074: Misc. B, 1944-1946
This folder contains nothing of interest.

Box 364
Folders 364/075 & 364/076: Coal, 1944-1945
This folder contains correspondence, internal reports, etc. documenting Quincy's ***coal*** *procurement, consumption, etc. Some of these documents, specifically invoices, permit tracking Quincy's* ***coal*** *supply to its mines of origin.*
1. Jan. 20, 1944. Summary of **Steam Coal**. Average daily **coal** consumption estimated at 140 tons.
2. Feb. 23, 1944. R. D. Blackburn to W. P. Todd.

Table

Re. **Steam Coal**	
On hand morning of Feb. 19	
Stamp Mill	2600 tons
Mine	800 tons
Total	3400 tons

3. Feb. 29, 1944. Invoice for **coal** purchased from and shipped by the Isle Royale Copper Company: or 80.090 tons **bituminous coal** hauled in February (200 truckloads)."
4. **Coal** Analyses dated April 20 and May 10, 1944 (Assay data is also available for several scattered dates in 1945):

Table

"Assay on Steamer Kickapoo"		
	4/20/44	5/10/44
Water	9.06%	3.67%
V.M. (Volatile Material?)	34.53%	37.495%
Fixed C. (Fixed Carbon?)	52.66%	53.805%
Ash	12.81%	8.7%
Sulphur	1.99%	2.31%
B.T.U.s	12,130	13,591 and 13,669

5. **Coal** deliveries for 1944 and 1945 (Not comprehensive):

Table

Coal Invoices from the North American **Coal** Corporation		
Date	Year	Tons **Coal**
4/12	1944	6798.95
5/28	1944	6867.85
6/21	1944	6820.7

Coal Invoices from the North American **Coal** Corporation		
7/4	1944	7038.85
9/28	1944	6900.05
10/18	1944	6342.7
11/5	1944	6757.1
4/25	1945	6471.85
5/17	1945	6997.5
8/9	1945	6623.5

Box 364
Folder 364/077: Copper Costs
This folder contains nothing of interest.

Box 364
Folder 364/078: Cost Sheet, 1942-1947
This folder contains nothing of interest (Accounting Data).

Box 364
Folder 364/079: Compensation Insurance Data, 1943-1947
This folder contains nothing of interest.
1. A.J. Janis, M.D. to Quincy Mining Company re. substantial facial injuries sustained by Peter Vairo while ork on Feb. 13, 1945.

Box 364
Folder 364/080 & 364/081: Cash Statements, 1944-1948
These folders contains nothing of interest (Accounting Data).

Box 364
Folder 364/082: C.I.O., 1945-1946
This folder contains little of interest to the project. The following letter raises questions about the disposition of Quincy's Stamp Mill at this time:
1. Feb. 2, 1946. W. P. Todd to C. J. McKie. I had not now here as any unusual adjustments of labor at the Reclamation Plant during the last half of October, as I had estimated that all this had been adjusted and out of the way during the early days of the month, as it is my recollection that the stamp mill boiler plant went out of operation very early in the month and that the electric pumps were installed at that time."

Box 364
Folder 364/083: Misc. C, 1944-1945
This folder contains nothing of interest (Mostly accounting data, some correspondence indicating speculation about possibility of renewed mining activity.)

Box 364
Folder 364/085: Department of Conservation, 1929-1946
This folder contains nothing of interest.

Box 364
Folder 364/084
This folder is missing.

Box 364
Folder 364/086: Dock Rental, 1944
This folder contains nothing of interest (Smelter Dock).

Box 364
Folder 364/087: D.S.S. & A. Railroad, 1945
This folder contains nothing of interest.

Box 364
Folder 364/088: No. 6 Drum
This folder contains nothing of interest.

Box 364
Folder 364/089: Misc. D
This folder contains nothing of interest.

Box 364
Folder 364/090: Diamond Drilling, 1945
This folder contains nothing of interest (Exploratory drilling).

Box 364
Folder 364/091: Electrical, 1945-1946
This folder contains nothing of interest (Documents relating to sale of electrical motors, generators, etc. at mine and smelter sites, mostly inquiries from a company looking to buy equipment).

Box 364
Folder 364/092: Equipment Sales, 1946-1947
This folder contains correspondence relating to misc. equipment sales.
1. May 9, 1946. C. J. McKie to E. E. Cherry. Quincy Mining Company willing to sell one used 8 foot by 36 inch rdinge Conical all ill ith Scoop Feeder, Hard Iron Liners and Herringbone gear drive for $5,000. Also a Marcy Mill with manganese liners and a Marcy Mill thout ners These latter two ffered May , 946).

Box 364
Folder 364/093: Misc. E
This folder contains nothing of interest.

Box 364
Folder 364/094: Misc. F
This folder contains nothing of interest.

Box 364
Folder 364/095: General Information — Mine, 1944-1945
This folder contains documents indicating scrap being hauled out of mill.

1. June 26,1945. J. H. Green Company redit Memo. 8,210 lbs unspecified scrap — "SCRAP FROM MILL" — hauled out of the mill in three ruckloads.
2. July 23,1945. J. H. Green Company redit Memo. 67,130 lbs scrap iron hauled in 11 truckloads from the Quincy Mill.

Box 364
Folder 364/096: Government Forms, 1943-1945
This folder contains nothing of interest.

Box 364
Folder 364/097: Misc. G, 1945-1947
This folder contains more documentation of scrap iron being hauled away from the mine and mill.

Box 364
Folder 364/098: Hancock Fire Department
This folder contains nothing of interest.

Box 364
Folder 364/099: Houghton County Electrical Company
This folder contains nothing of interest.

Box 364
Folder 364/100 and 464/101: Sale of Houses, 1945-1947
This folder contains nothing of interest (sale of company houses).

Box 364
Folder 364/102: Misc. H
This folder contains nothing of interest.

SubSubSeries 2.7.2 Subject Files, 1948 - 1949

Box 372
Folder 372/058: Insurance – Reclamation Plant, 1948-1949

This folder contains a ledger sheet dated 3/1/48 listing average number of employees at the reclamation plant as 90 for the year 1947. Employees are split into a group of 11 and a group of 79 (the former presumably management/foremen/etc.) It is not clear from this document whether the numbers given refer to the reclamation plant only or the entire facility.

Folder 372/059: Reclamation Plant Inventories, 1947

1. January 21, 1948. J. Chynoweth and L. Koepel to Loomis, Sutton, Fernald (presumably company accountants). This letter gives inventories of production materials on hand at the Reclamation Plant on December 31, 1947, as follows:

Table

General Supplies	$ 44,219.40
Grinding Balls	$ 10,306.33
Liners	$ 9,735.67
Pine Oil	$ 2,787.15
Xanthate	$ 773.42
Steam Coal	$ 2,460.59

2. January 30, 1948. Chynoweth to A. M. Manfred, Quincy Mining Co. Treasurer. This letter corrects information relating to **xanthate** and **pine oil**, giving amounts of each on hand: 4,250 lbs **xanthate**; 27,200 lbs **pine oil**.

Folder 372/55

This folder contains nothing of interest.

Box 373: Grinding Balls, 1949

Folder 373/066

The folder contains wo letter exchange between the Globe Steel Abrasive Company and Quincy, in which the former offers used grinding balls for sale. J. Chynoweth replies asking for a sample. Letters date to April of 1949.**SubSeries 2.7 Correspondence of McKie and Subsequent Eras**

Box 372

Folder 372/001: Correspondence between W.P. Todd and C. J. McKie

This folder contains various correspondence relating to Quincy matters. Much of it is concerned with taxes and the like. A few letters of interest:

1. June 2, 1947. C.J. McKie to W.P. Todd. McKie informs Todd about a company, Rock Wool Co. of St. Paul, making inquiries about purchasing slag for conversion, presumably, to insulation.
2. July 31, 1947. C. J. McKie to W. P. Todd. McKie and Todd exchange letters regarding a state highway department request that Quincy remove mill launders crossing M-26 at Mason (there were two). Todd agrees that they can be removed.

Box 372

Folder 372/002: Todd & McKie, Cont'd., Jan. 1948 - Dec. 1948

This folder contains more correspondence of similar nature to that described above.

1. Feb. 2, 1948. McKie to Todd. Quincy is in the process of selling its **coal dock** and wers for scrap.
2. Quincy is receiving inquiries from different firms about whether the company would be willing ell e ails, tc., f e Quincy orch Lake Railroad for scrap or reuse.
3. Oct. 22, 1948. McKie to Hyman-Michaels Company. Advising that Quincy has "decided to postpone the scrapping our ailroad until next spring."
4. Dec. 31, 1948. M to T. Scrapping of **coal dock**, etc., still in progress. Apparently incremental progress.

Box 372

Folder 372/003: Todd & McKie, Jan. 1949 - Dec. 1950

Things seem to be slowing down for Quincy. Letters increasingly relate to lease of property and potential sale of equipment for scrap or reuse. Some interesting letters, but only moderately so:

1. Dec. 10, 1949. McKie to State of Michigan Dept. of Conservation. Quincy now employs 129 men between the Reclamation Plant and the Smelter (no breakdown given by facility).
2. July 7, 1950. T to M. Todd states Reclamation Plant operated t oss for a eek, he has little onfidence n ts ontinued ability tay ofitable.
3. Nov. 8, 1950. Rock Wool Company to McKie. Rock Wool placed an order for one car per month of smelter slag.

Box 372

Folder 372/004: Todd & McKie, Jan. 1951 - Dec. 1952

More early '50s correspondence. Rate of correspondence is slowing down.

1. June 12, 1951. C. J. McKie to F. G. Pardee. "During the year 1950 the Reclamation Plant treated 1,006,355 tons of sand. We expect to finish treating all commercial sand in our #1 Pile before the end of 1951. The outlook for successfully treating #2 Pile is not too bright. A large portion of the pile is above water level and is oxidized and cannot be reclaimed. A 1000 H.P. booster pump and new discharge line must be installed, and t now appears there will be a power shortage in the district that may curtail our normal load and eliminate any possibility of increasing our load.
2. Nov. 5, 1952. C. J. McKie to Harry J. Hardenberg, Deputy State Geologist. "The #1 sand pile at the Quincy Reclamation Plant is about exhausted. The dredge was supposed to move to the #2 sand pile in October, but due to slow delivery of equipment, it will be next spring before the change over can be made." Quincy waiting for a 1,000 h.p. booster pump to move ailings he greater distance.

Box 372

Folder 372/005: Todd & McKie, Jan. 1953 - Aug. 1957

This folder contains more of the same kind of correspondence. Subjects dealt with increasingly relate to property management and especially labor relations. Surprisingly, no letters were found referring to the sinking of Quincy's dredge, aside from the one reproduced, in part, here:

1. Jan. 24, 1956. C. J. McKie to Harry J. Hardenberg, Deputy State Geologist. "On Jan. 14th our No. 1 Dredge sank in about 55 feet of water. When purchasing our No. 2 Dredge from

Calumet ecla last summer it was planed to operate both dredges; one at No. 1 bank to recover the fine sands still there and the other at No. 2 bank to recover the coarse sands, and by mixing sands from both banks in our Reclamation Plant to make it possible for us to successfully handle the fine sands from our No. 1 bank. Now with our No. 1 Dredge at the bottom of the lake it may not be possible for us to successfully handle as much of the sands still remaining in the No. 1 bank. Therefore, the life of our operations may be reduced."

Box 372
Folder 372/055: Grinding Balls, 1948 - 1949
This folder contains nothing of interest

Box 372
Folder 372/059: Reclamation Inventory Sales
This folder contains nothing of interest

Box 372
Folder 372/067: Pine Oil, 1948 - 1949

Box 372
Folder 372/069: Power, 1948 - 1949
This folder contains nothing of interest. It does have a copy of the power contract between Quincy and C & H.

SubSubSeries 2.7.3 Subject Files, 1950-1951

Box 373
Folder 373/038: Coal, 1950-1951
This folder contains correspondence, assay data, and bills of lading relating to ***coal*** *and its use and shipment by and to the Quincy Mining Company.*

1. June 27, 1950. C. Lawton to W. P. Todd. "In connection with **coal** requirements for No. 5 Furnace and the Reclamation Plant for the period of Sept. 1950 to June 1951. Kindly be informed that Mr. Koepel called and recommended 1500 tons of stoker **coal** size 1" to 3/8 or 1/4 an not larger than one inch. This tonnage will take care of the Reclamation Plant, Mine Office, smelter office and Smelter Laboratory."

Box 373
Folder 373/066: Grinding Balls, 1950 - 1951
This folder contains nothing of interest.
SubSubSeries 2.7.4 Subject Files, 1952 - 1971

Box 374
Folder 374/020: Power, 1954 -1957
This folder contains nothing of interest.

SubSubSeries 2.7.5: Subject Files, 1950-1972

Box 375
Folder 375/004: Coal, 1961-1965
This folder contains nothing of interest.

Box 375
Folder 375/069: Invoices - Portage Coal & Dock Co. 1970-1971
This folder contains nothing of interest.

SubSubSeries 2.7.6 Subject Files, 1940-1971

Box 377
Folder 377/005: Correspondence between W.P. Todd and John Chynoweth, 1962-1964
Informant EK explained that after C.J. McKie's death John Chynoweth, who was Quincy's smelter superintendent (it appears he also continued some clerk duties), assumed McKie's managerial duties while remaining smelter super. According to the appendixes to the Tech Archives' Quincy Records finding aid, McKie was general manager until 1961, so it is expected that this is the time that Chynoweth took over management responsibilities. Accordingly, some of his correspondence from the late Quincy period is reviewed below.
1. April 27, 1963. J. Chynoweth to W. P. Todd. "Kindly be informed that should the Reclamation Plant maintain the present production we will operate until June 1st. It may slow the operation a bit, but I am sure we can produce at a satisfactory cost.

Box 377
Folder 377/006: Correspondence to and from Superintendent John Chynoweth, 1959-1968
This folder contains miscellaneous scattershot correspondence relating to various Quincy matters. These documents were reviewed for some perspective on Quincy's last years, which has been difficult to achieve from records related more directly to the works at Mason.

1. Oct. 21, 1968. Yalmer Mattila Contracting, Inc. Proposal to move a 40 foot by 40 foot Butler building from Mason to Ripley, construct a foundation and slab for the building, at a st f ,928.

Box 377
Folder 377/007: Correspondence to and from Superintendent Chynoweth, 1965-1967
This folder contains nothing of interest.

Box 377

Folder 377/008: Correspondence Between President and Smelter Superintendent John Chynoweth, 1965-1969

This folder contains correspondence relating to the last years of the Quincy smelter. There are infrequent references to the reclamation plant (rather, there are frequent references but these are usually in the form of cost summaries, only). These documents were reviewed for some perspective on Quincy's last years, which has been difficult to achieve from records related more directly to the works at Mason.

1. Dec. 22, 1969. J. Chynoweth to W.P. Todd. Re. Furnace Repairs. Company still discussing, perhaps making repairs to the smelter furnace at this late date. hey e parting ut furnace burners to keep the main ones going. "We are going to have a much better furnace for smelting scrap and, no doubt, with the raised roof this repair will last much longer an e last."
2. Feb. 14, 1969. W. P. Todd to J. Chynoweth.

"We have your letter of the 11th instant covering memorandum of telephone charges by Jack Foley amounting to $47.31.

"I am not familiar with the details of any of these charges except the one to Morristown but I am backing the Foley efforts to build our old reclamation plant building into a rod and wire mill and I assume these charges are in this connection. Therefore kindly pay them and charge to general expenses."

3. July 7, 1967. J. Chynoweth to W.P. Todd. "The attached is a report of the Plant Watchman. It is the first visit at our Plant of the local fire bug, who has caused many fires."

Box 377

Folders 377/009 - 377/013: Correspondence — Taxes, 1952 - 1971

These folders contain routine correspondence relating to taxes. Nearly all of the correspondence consists simply of letters which accompanied tax paperwork. None of it is of interest.

Box 378

Folder 378/006: Letters & Invoices re: Oil Containers, 1953 - 1958

This folder contains invoices and associated letters related to deposits for the return of empty oil drums to the Standard and Mobilgas oil companies, as well as the return of empty pint-sized chemical bottles to the Du Pont company. The information contained thereon is not sufficient to make any strong connections with the Mason operations. Indeed, some correspondence suggests the chemical bottles are more closely related to smelting activities.

Box 378

Folder 378/007: Correspondence with Miles Metal Corp., 1965 - 1969

Folder contains correspondence with the Miles Metal Corp. having to do with the smelter. There is material relating to the sale of slag and also some scrap reprocessing operations. It appears some kind of partnership was formed between Quincy and Miles. The latter company, at any rate, apparently played a role in procuring scrap material for Quincy to process at its smelter.

1. April 18, 1966. Chynoweth to S. Silver, vice president of Miles Metal Corporation. "Replying to you letter of Apr. 15, 1966, kindly be informed that the paper covered wire and ils e till n and. he Laboratory test showed nineteen percent (19%) paper and one percent (1%) enamel. We are, however, going to burn the bales and will ascertain e ue rcentage."

Box 378
Folder 378/008: Correspondence — Aaron Ferrer & Sons Co. (Scrap), 1968 - 1971
During this time period, Quincy appears to have smelted copper scrap for the Aaron Ferrer & Sons Co. on a contract basis. Documents in this folder concern that operation and business relationship. They are not of interest.

Box 378
Folder 378/009: Correspondence — Purchase Proposals, 1970
This folder contains nothing of interest.

Box 378
Folder 378/010: Correspondence and Documents re: Mine Operations, 1970 - 1971
This folder contains nothing of interest.

Box 378
Folder 378/011: Ameltco Inc. (Claim for Low Assay), 1970 - 1971
This folder contains correspondence relating to problems with smelted copper assaying to high in impurities. It is not relevant to the project.

SubSeries 3.3 General Accounting Ledgers

Box 629: Mine Ledger — Reclamation Plant, 1943 - 1970
This folder contains ledger sheets relating to the operation of the Quincy reclamation plant. All data is given as dollar figures and is not particularly useful. These ledgers may be in identifying when major purchases were made.

Subseries 3.5 - Cost Sheets and Other Cost Data, 1893-1983

Box 472, Folders 472/008 through 472/017; Box 473, Folders 473/001 through 473/012; Box 474, Folders 474-001 through 474/005
These folders contain cost breakdowns and, more usefully, metallurgical analyses for Mining, Smelting, and Reclamation Plant operations over the full course of the Reclamation Plant's existence. The cost breakdowns reflect the operational sequence of the reclamation operation: DREDGE --> SHORE PLANT --> BELT CONVEYOR/STORAGE BINS/LAUNDERS --> TAILING PUMP --> PUMPING WATER (pump house?) --> GRINDING --> TABLE CONCENTRATION --> FLOTATION --> SMELTING. The metallurgical analyses contain annual tatistics or nnages f and ocessed and esulting pper oduction. hese e reproduced in Table above. Mining and Smelting data shed some light on relevant aspects

of those operations. Anomalies and information of special interest identified in all three types f ecords e escribed irectly low.

Notes:

1943: The Reclamation Plant went into production in November.

1948: Smelter reports indicates Quincy mineral was smelted at both the Quincy and C smelters. In 1948, C smelted more Quincy mineral (6,103,981 lbs) than Quincy did (4,324,218 lbs)

1952: Quincy cast some scrap copper at its smelter in this year. Also, apparently, smelted some mineral for the Copper Range Mining Company.

1953: ost reports break down Quincy's power expenditures into electricity bought from C & , from the Upper Peninsula Power Company, and electricity Quincy produced itself using diesel generators. In this year, C was the primary source of electrical power, with iesel a distant econd and PPCo a very istant ird.

1953: "Pounds Mineral Produced (Wet)" numbers are given in truckloads as well as pounds, indicating Quincy hauled mineral to its smelter via truck. For example, 113 trucks "wet mineral" in May of 1954. Presumably, "wet mineral" refers to post-flotation mineral retaining water from the milling process.

1956: The Reclamation Plant apparently processed "barrel work" from Quincy's No. 5 Adit from June through December of this year, though why barrel work would have had to go through the reclamation process is uncertain. "Barrel work" usually refers to pieces of native copper large and pure enough to be smelted irectly ter eir recovery from the ground. Maybe this material did go directly to the smelter, but was recorded with the reclamation data for some reason known only to Quincy management.

1958: No metallurgical data for February through October, indicating the Reclamation Plant was idle during this time. Only nine trucks were loaded with mineral in January, indicating the shutdown likely began in the middle of that month.

1958: No diesel power generation was reported for this year or any year following.

1962: Plant idle from June through August.

1965: Plant idle for month of October.

1967: Plant idle June through December.

1967: Smelting Works idle June through December.

1968: Smelter idle January through May (yet "melting" cost still recorded), smelting nly secondary copper the rest of the year.

1968-1970: Reclamation plant idle.

1969-1970: Smelting works smelting only secondary copper. No production in December, 1969.

Note on Secondary Copper (Scrap): Smelter data indicate scrap processing was a regular, but relatively small-scale dimension of the activities at the smelter. This is consistent with accounts from oral history narrator RK. These data sheets contain more detailed information about copper production from scrap, it that is of interest.

General note: Documents also have such data as cost per pound for reclamation of copper and cost per ton of stamp sands treated at the plant.

SubSubSeries 3.6.1 Taxes

Box 714
Folders 714/004 - 007 State Tax Commission, Reclamation Plant, 1944-1966
These folders contain Quincy cost sheets and other financial data for the specified dates. These are not of interest.

Subseries 3.7 - Inventory Records 1888-1943

Box 676
Folder 676/___: Mine & Mill Inventory 1924

Box 677
Folder 677/004: Coal Book, 1899-1908
This folder contains a ledger sheet documenting consumption of bituminous coal at Quincy's Engine House, Assay Office, and Carpenter Shop. It is not clear where these buildings were located, but "engine house" strongly suggests these facilities were located at a mine and not at the mills.

Box 677
Folder 677/005: Coal, 1906
This folder contains loose ledger sheets documenting coal distribution to Quincy's various facilities. Coal for the mills is shown below:

Mills Coal, 1906		
Month	**Mill No. 1 Boiler**	**Mill No. 2 Boiler**
January	1,946	1,287
February	1,537	1,251
March	1,639	1,392
April	407 ("B.R."), 127 ("Screng.), 959 ("Lump")	343 ("B.R."), 846 ("Lump")
May	--	--
June	Boat 1,001; Shed 859	Boat 530; Shed 424
July	1,329	943
August	951	738

Mills Coal, 1906		
September	1,542	1,167
October	1,787	1,270
November	1,895	1,258
December	1,814	1,213

Box 677
Folder 677/005: Coal Analyses, 1918-1931
This folder contains slips with minute data relating to coal assay values. Examples:

No.: 1A
Coal Steamer: Chas. W. Kotcher Date: May , 918
Boat Run: Mansfield Lump Shipper: Cleveland & Western.
Moisture: .95%
Volatile Matter: 33.25%
Fixed Carbon: 52.50%
Ash: 12.31%
Sulphur: 2.48%
Calorific alue (B.T.U.) Determined: 12,510
by formula: _____

Coal Steamer: Schneider Date: June 16th, 1931
No.: B. Shipper: North American Coal orp.
Field: Red Parrot Sample: Egg.
Moisture: .885%
Volatile Matter: 34.625%
Fixed Carbon: 59.435%
Ash: 4.055%
Sulphur: .96%
Calorific alue (B.T.U.) Determined: 14,407

Box 677
Folders 677/007 and 677/008: Inventory, Stamp Mill, 1890, 1899-1902
These folders contain inventories of mostly consumable materials, hardware, and small tools for the mills.

Box 677
Folder 677/017: Equipment Inventory, 1945.
This folder contains inventories of equipment at various Quincy facilities, including electrical inventories for the mill by Robert Jarvis. Nearly all of the listings for the mill are electrical motors. For instance, each ball mill and flotation machine in the mill had its own electrical

motor. <u>It is not clear whether this equipment was in active use at the time this inventory was taken.</u> See **{PDF34}** for examples.

Box 677
Folder 677/016: Inventory Sales, 1945-1947
This folder contains sales slips and reports related to Quincy selling sundry pieces of equipment etc. from its different facilities, including a few scrap metal sales to Klatzky and other scrap contractors.

1. June 24, 1947. "Sale of Old Material" reported the sale of "Mill dock towers" in April and May or a total f 2,365.83.

Subseries 3.8 - Supply Records, 1866-1967

Box 661
Folder 661/001: Reclamation Plant Supplies, 1947-1967
This folder is a ledger book showing expendable supplies acquired for the reclamation plant. Most of the subject headings within the book deal with replacement parts for plant equipment, such as ball mill liners, filters, screens, bushings, etc. There are also several sundry items such as brooms, manila rope, shovels, and the like. Some items of interest to the project are outlined below.

<u>Coal</u>

- Quincy purchased and eceived shipments of **coal** from steam freighters "A.E. Cornelius," "Robert obson," and adillac."
- **Coal** is described s **Stoker Coal**."
- The bookkeeping method for this **coal** is relatively inscrutable, ut ppears uincy received the following shipments of **coal**:

<u>Table</u>

Year	Date	Ship	Quantity
1962	9/23	Cadillac	1,070.60 tons
1963	9/25	Robert Hobson	1,200.250 tons
1965	6/4	A.E. Cornelius	1,588.4 tons

<u>Xanthate</u>

- Quincy ordered almost all its **xanthate** from Dow Chemical ompany, with a few purchases from C and a few purchases from American Cyanamid
- This product as isted s **Name: Xanthate Z-11**; **Description: Sodium Isopropyl**"
- Almost without exception, **xanthate** was ordered on a monthly basis
- Quantities f **xanthate** ordered varied to some degree, but were usually between 7,000 and ,000 lbs, elivered n 50-lb drums
- On May 25, 1967, Quincy sold its remaining stock of **xanthate**, 10,250 lbs worth, to C

Pine Oil

- Quincy rdered all its **pine oil** for flotation from the Hercules Powder Company
- This product as listed as "Name: **Pine Oil**; Description: Yarmor 'F'"
- **Pine oil** was ordered on pretty much a monthly basis, orders usually between 3,000 and 5,000 lbs

Box 667

Folder 667/003 Reclamation Plant Inventory, 1943-1945

This folder contains hand- and typewritten inventories of Reclamation Plant supplies as of Dec. 31, 1943 and Dec. 31, 1945. These inventories list supplies and tools down to minutia such as pipe fittings and hardware, as well as various types of files, etc. Of note:

1. Dec. 31, 1943. Supply inventory shows here as 34,800 lbs of **Xanthate** on nd, 6,084 gallons of **pine oil**, and 50 gallons of **kerosene**.
2. Nov. 1, 1943. Inventory of Laboratory Supplies. This is an inventory of laboratory chemicals and supplies on hand at the onset of operations at the reclamation plant. This is he inventory:

Table

Quantity	Chemical/Item
90#	**C.P. Ammonia**
40#	**Com. Nitric Acid**
100#	**C.P. Nitric Acid**
125#	**C.P. Sulphuric**
15#	**C.P. Hydrochloric**
5#	**Cream of Tartar**
25#	**Sodium Carbonate**
8#	**Sodium Bicarbonate**
30#	**Borax Glass**
5#	**Test Lead**
5#	**Lead Foil**
230	1-1/2-inch cupels
165	2-1/4-inch Scorifiers

Quantity	Chemical/Item
51	J Crucibles
26	L Crucibles
400	#4 Whatman Filters
310	#40 Whatman Filters

Box 667
Folder 667/004: Reclamation Plant Inventory, 1946 & 1947
This folder contains supply inventories for Dec. 31, 1946, and Dec. 31, 1947. These are similar in nature to the supply inventories listed above.

1. Dec. 31, 1946. The reclamation plant had on hand 108.6775 tons of Grinding Balls, two drums of **pine oil**, 2,025 lbs of additional **pine oil** perhaps bulk **pine oil**), nd 24,500 lbs f **Xanthate**.

Subseries 4.1 - Surface Records, 1862-1945

Box 746
Folders 746/003 & 746/004 Trucking/Shipping Invoices, Jan. 1943 - Aug. 1943
*These folders contain shipping invoices from the William Johnson & Sons Logging and Trucking Company. According to its invoice stock, the company specialized in hauling wood, **coal**, dynamite, and blasting supplies. Many of these invoices state simply "Haul Freight," or the like, and cases of gelatin (apparently used for blasting?) were a frequent cargo. Not of much interest for the project.*

1. Oct. 28, 1943. "Haul Grinding Balls from C.R. opper Range) Smelter to Stamp Mill."

Box 747
Folder 747/005: Reports -- Installation of steam turbine equipment
This folder contains various reports and correspondence related to preliminary planning and testing for installation of an exhaust steam turbine between the stamp mills.

- It appears the plan was or the turbine (a dual pressure turbine what was eventually installed) to run mostly on exhaust steam from the mill's stamps, with only supplementary "fresh" steam coming from one of the boiler houses.

Box 748
Folder 748/001: Mill Reports from J. Hayden to C. Lawton, 1919-1921
This folder contains mostly reports on day-to-day operations at the mill. There are a few updates from a 1920/1921 upgrade to the mills' equipment, but nothing crucial happened during those upgrades.

Box 748

Folder 748/004: Bureau of Mines Report: Vulnerability of Quincy to Sabotage, 1942

This folder contains limited correspondence as well as a report related to national security concerns surrounding the Quincy as part of a vital national defense industry.

- Quincy Mill was visited September 7, 1942
- With egard isk f Sabotage and Subversive Activities," the report stated: "No indications of sabotage or subversive activities have been noticed by the management. No subversive groups are known to live near the property. Local law enforcement officers feel the Axis powers must be defeated and are exercising extra vigilance n an endeavor prevent abotage."
- With egard e plant's lectric wer: ,300 olt, 0-cycle, is purchased from the Houghton ounty Electric Light Company on Sundays and holidays, also during emergencies due to shut down of mill electric generator. The transmission line is of wooden-pole construction. The transformer station is located about 100 feet from the nearest building and is enclosed in a small wooden structure. No provision has been made to catch oil in an emergency."
- General servations: "The inhabitants in the general mill area and in towns where employees live are believed loyal."
- The inspector made several recommendations for improving plant security, including fences, lighting, and 24-hour security patrol as well as requiring employees to wear name badges. .H. awton's esponse in tter ated an. 5, 943): "We ink t s a an excellent report and would be pleased to comply with many of the recommendations would e ice f opper nly warrant t."
- The report also notes "About 0 gallons **naphtha** is ored in a non fireproof building. **Coal**, amounting to some 30,000 tons at the start of the winter season, is stored in an open pile. No difficulty has ever ben experienced from fires in the **coal** pile."

Box 748

Folder 748/004: Tonnage and Tailings Reports, 1954

This folder contains correspondence and an assemblage of documents related to an IRS examination of Quincy's tax records related to losses claimed on sales of property. The IRS was seeking information related to tonnages of ore milled at Quincy's mills, "tonnages of copper concentrate recovered, and tonnages and assay of tailings deposited in Torch Lake."

-

1. May 31, 1921. "Exhibit #1: Stamp Sands Deposited in Portage and Torch Lakes." This is a table howing 2,911,000 ns of stamp sand was deposited in Torch Lake from 1890 through 916.
2. June 1, 1921. C. Lawton to W. Todd. "Re: Cost of Re-treating Stamp Sands." This letter is the earliest reference to a reclamation plant found so far. In it, Lawton states:

   "To eat e amp Sands and extract the recoverable copper they contain, the construction of a mill of 10,000 tons daily capacity, together with power and water plants would cost, approximately, $750,000.
   A dredging plant to deliver the sands to the Mill would cost approximately $300,000.
   TOTAL: $1,050,000.

3. Sept. 23, 1953. C.J. McKie to A.M. Mansfield. Timelines attached to this letter gives tons of rock stamped, copper content, and tenor of rock (Cu. Recovered per Ton) for 1889 1940 as ll say values f waste ands deposited from 1902 to 1940 (Average 4.61 lbs Cu. per ton of ore). The timelines also include the following equipment upgrades:

Table

Year	Equipment
1903	"First Coarse System Installed"
1916	First Ball Mill Installed
1921	Ball Mill on Each Unit
1922	Automatic Sampler on each Unit
1929	Flotation on each Unit
1932-1936	Mine Closed

Subseries 4.3 - Stamp Mill Records, 1860-1945

Box 773

Folders 773/001 to 773/016: Mass Copper and Mineral Shipments Reports, 1907-1945

This folder contains reports in various forms of mass copper and mineral shipped from the mill to the smelter. It appears to be fairly comprehensive coverage of the years given, and this data could be used to chart mill production rates over time, but this is the only foreseeable utility for these reports.

Box 774

Folder 774/002: Stamp Sands Data, 1940-1943

This folder contains reports from stamp sand assay tests conducted in 1940. Also a blank application for a Reconstruction Finance Corporation mining loan. As well as cost estimates for the reclamation plant operations dated Sept. 15, 1943 (The reclamation plant went into production in November) and another, more detailed cost of operations estimate that is undated. See **{PDF35}**.

Box 774

Folder 774/002: Stamp Sands Data, 1940-1943

This folder contains preliminary reports and test results relating to a reclamation plant for Quincy, pre federal intervention. These reports were found in numerous other locations in the archives, and are described and summarized elsewhere in these notes. One document of note:

1. **{PDF36}** This report on stamp sand tests provides a numerical history of stamp sand deposition into Torch Lake from mills No. 1 and No. 2.

Box 774
Folders 774/003, 774/004 and 774/006 to 774/008: Stamp Mill Reports - Shipments, Returns, 1922-1924, 1927-1928, and 1941-1942
These folders contain monthly reports of copper content per ton of rock stamped. This data duplicates data aggregated in Table B.

Box 774
Folder 774/005: Ore Dressing Reports, 1911, 1913
This folder contains blueprint reproductions of reports from lab tests of various milling operations. This is very minute, technical data. It does not necessarily reflect methodologies that were put into practice at the mill.

Box 774
Folder 774/010: Assay Book, 1899-1900
This folder contains a lab technician's notebook from the time given. This includes tailings assays from Mill No. 1, but within a very narrow timeframe. Most of the data is technical minutia.

Subseries 4.4 Assay Records

Box 786
Folder 786/001: Weekly Report of Waste Sands, 1909-1913
This folder is missing. Other folders in the box contain minute operational details pertaining to the mill and smelter, such as assay reports on waste sand samples taken from the mill's launders, as well as assay reports on mineral and milled material taken from jigs and other steps in the milling process.

Subseries 4.5: Reclamation Plant Records, 1940-1968

Box 788
Folder 788/ : Reclamation Plant Journal, 1943-1946
This is an accounting journal in one volume. Its handwriting is difficult to comprehend.

Box 789
Folder 789/ : Reclamation Plant Production — Includes Smelter Figures, 1948-1965
This journal in one large volume contains daily production data for the Quincy Reclamation Plant for the years specified. Monthly totals are tallied on each page along with smelting data (mineral smelted and copper content). Pages from December, 1951, onward often contain laboratory reports on mineral, including water content, percent copper, etc. Last entry is for December, 1965.
1. Dec. 1951. Report curiously lists "Quincy Mineral Smelted As Copper Range."

Box 790
Box 790 Folders 790/001 to 790/006: Daily Reclamation Statistics, 1961-1967

These folders contain printed tickets (similar to receipts) with daily Reclamation production data. An example:

Table

	Sept. 20, 1961
Reclamation	
Daily Tons	2123
“ Trucks Mineral	2
Total Tons to Date	46827
“ Trucks Mineral to Date	41
Daily Copper	9573
Total Copper to Date	201251
Time lost on 6 Ball Mills	
Repair	14hrs.

The tickets remain in identical format in 1967. 1965 is missing.

Box 790

Box 790 Folders 790/007 to 790/010: Mineral Shipments, Reclamation Plant, 1943-1946

These folders contain weekly reports of mineral shipped from the Reclamation Plant to the smelter. There are columns for “No. 1”, “No. 2”, “No. 4”, “Flotation”, “Mill Mass”, and “Mine Mass”. The numbers are presumably shaft numbers. For Nov. and Dec. 1943 there was no mineral from any source other than Flotation. A random sampling of reports from the other folders showed this continued to be the case.

1. Quincy Reclamation Plant Monthly Report for October, 1943. Report indicates “Mineral Shipments to Copper Range Smelter.” Presumable all of the mineral went to the Copper Range smelter. Shipments were by rail.
2. Folder 790/009, for 1945, contained handwritten and typed notes indicating Quincy was having mineral smelted at the C Smelter and having a hard time with its railroad cars. would not accept cars containing less than 40,000 lbs mineral, apparently; C & H was willing ent 0,000 pound capacity railroad cars to Quincy for a dollar a day. Cars Quincy could get from Copper Range or from its own mill lacked sufficient capacity to meet C 's 40,000-pound minimum requirement.

Box 791

Folder 791/001: Mineral Shipments, Reclamation Plant, 1947

This folder contains weekly reports of mineral shipped from the Reclamation Plant to the smelter, identical to the reports described just above.

Box 791
Folder 791/002: Transfers, Reclamation Plant to Smelter, 1959-1968
This folder contains forms documenting materials transfers from the Reclamation Plant to the Quincy Smelter. Steel plates, straps, and the like are examples of types of supplies.

Box 791
Folder 791/003: Estimates for Reclamation Work including Stamp Sand Assays, 1940-1944
This folder contains memoranda, cost estimates, stamp sand assay tests, mill output reports (1889 to 1940), rough plans, etc. relating to proposals/planning for the construction of the Quincy Reclamation Plant. Some of these predate federal government involvement. There are a few maps, which seem to be related to the stamp sands tests, but they are inscrutable.
1. There is a flow chart of the reclamation process as proposed for the No. 1 Unit at the Stamp Mill. **{PDF16}**

Box 791
Folder 791/004: Reclamation File, 1943
This folder contains limited correspondence and a few blank War Production Board materials acquisition forms related to the startup of Quincy Reclamation.
- Startup costs for the Quincy Reclamation Plant totaled $40,450.

Box 791
Folder 791/005: Assays, Reclamation, 1944, 1947, 1954
This folder contains data sheets related to assays of mill product in the Quincy reclamation plant's regrinding mill. Most of it consists of fairly inscrutable handwritten notations.
- One undated tation written n e back f a blank ledger heet appears ve e ate at ich **xanthate** and **pine oil** were fed into the flotation systems. **Pine oil** was ed n at rates ranging from 16 to 17.5 cubic centimeters per minute. **Xanthate** was ed n at rates ranging from 64 to 69 cubic centimeters per minute.

Box 791
Folder 791/006: Reclamation Electrical Inventory, May 1944
This folder contains a complete inventory of the reclamation plant's electrical components, subdivided into dredge, shore plant, and substation/regrinding mill.

<u>Dredge</u>
- The dredge had General ectric Oil last Circuit reaker" hich eighted 65 pounds and ntained gallons f il.
- The dredge had two transformers for its main pump. No oil capacity is given (perhaps these re ry" ansformers)
- The dredge had two transformers for its "jet pump." Again, no oil capacity given.

- The dredge had two GE "potential transformers" and a bank of three other, unspecified transformers

Shore Plant
- Its "starting equipment" included an oil switch
- The ant had three transformers on two poles outside the facility. No oil mentioned.
- It had a transformer for its lighting equipment, but this transformer was air cooled

Substation
- The substation d eight oil last circuit reakers," ch containing nine gallons of oil. Weight f tank with il ven 25 lbs
- This inventory apparently doesn't include transformers the that were located outside the plant's northeast corner, which received incoming power.

Regrinding Mill
- There as n oil circuit reaker for the ill's slurry pumps. No oil capacity given.
- There ere six (6) oil circuit reakers, ving pacity of approx. 9.75 gallons oil per tank, associated with the ball mills inside the mill.

Box 791
Folder 791/007: Reclamation Plant Insurance, 1947
This folder contains nothing of interest.

Box 791
Folders 791/008 and 791/009: Reclamation Plant Insurance, 1943-1945
These folders contain nothing of interest.

Box 792
Folder 792/001: Quincy Reclamation Project Inventory, 1943
This folder contains another inventory of parts, machinery, etc. related to the different facilities which made up the reclamation plant, again subdivided into dredge, shore plant, substation, regrinding mill. Details presented are somewhat different than those found in the inventory described above (in Folder 791/006). This inventory seems to make it clear there were transformers on the dredge.

Dredge
- Three 50 KVA "oil type" transformers (Serial Nos. 6583979, 6583980, 6583981)
- One oil type transformer, Serial No. 7097370

Regrinding Plant
- Most f building was ron clad eel ructure -erected after having been moved from a previous location; supplemental timber construction was added
- Contained the following:
  - Electric rane
  - Six ardinge Ball Mills, each 8 feet by 72 inches, with liners d electric motors
  - Six Akins Classifiers with electric induction motors

- One Dorrco Vacuum Filter with pumps and blower
- One orr hickener
- One Dorr Slime Thickener
- A four-cell and a six cell Denver Sub-A Flotation Machine
- Various pumps (Slime pump, slurry pump, tailings pump, booster pump) with electric motors
- Nine Wilfley Tables

Electrical Substation

- See **{PDF17}**

Box 792

Folder 792/002: Calumet & Hecla #1, 1942 ***(multiple folders labelled "Folio No. 2" in box 792)***

These folders contain correspondence between C & H and Quincy related to construction of the Reclamation Plant. Most of these are letters accompanying checks which C & H, acting in the role of trustee for the reclamation project, sent to Quincy for countersignatures, also some work orders, equipment orders, and the like.

- The fourth folder labeled "Folio No. 2" contains progress reports from the construction of the reclamation plant. These consist mostly of equipment inventories with prices listed.

1. Order ated October 5, 943 or ne tank car 8,000 gallons) No. 5 **pine oil**. Oil came from General Naval Stores Div., Newport Industries, Inc. (Corporate offices at 230 Park Avenue, New York)
2. Order dated December 5, 1942. Includes order for "One (1) Dorrco Duplex sludge pump, suction type, No. 6 VM."

Box 792

Folders 792/003 to End of Box: Contracts, Purchase Orders, Etc. — Reclamation Plant Construction

These folders contain correspondence, orders, and contracts with contractors and equipment suppliers (and federal agencies) related to the construction of the Quincy reclamation plant. Noteworthy suppliers and contractors are listed below.

- Allis halmers Mfg. Co. — Misc. Parts and equipment
- American Bridge Co. — dismantling and re-erecting C 's No. 1 regrinding mill, conveyor ridge, shore plant, and dredging m
- Bucyrus ie o. — hydraulic dredge
- Roland . Buck Inc., engineers — Grading and foundation work for reclamation plant buildings, onstruction f ull or redge, onstruction and elivery f ntoons or dredge pipe
- General ectric — electrical equipment
- Metals Reserve Company requisitions for funds
- Dow hemical ompany **Xanthate** for flotation

1. Dredge machinery specifications sheets attached to letter dated July 20, 1942, list three 50 A transformers as part of the dredge's electrical equipment. is not possible o ell

whether these were oil filled or not. Modern 50 KVA transformers come in both dry and oil filled varieties.

2. GE specification sheets ttached o etter ted Sept. 10, 1942 indicate oil ype circuit breaker units contained ther gallons r 8 gallons il, ach.
3. GE Invoice dated Sept. 21, 1942 indicates uincy purchased hree (3) 15,000 volt, 600 amp oil circuit breakers. These were the type of circuit breaker that contained nine gallons of oil.
4. Dec. 26, 1943. Order for 40,000 lbs (in 160 drums) of **Sodium Ethyl Xanthate Z-4** from The Dow Chemical ompany
5. Invoices dated March 16, 1943 to Dec. 16, 1943 from the Houghton ounty Electric Light Co. indicate Quincy's power consumption from the electric company ranged from 480 and ,440 kilowatt-hours per month during that time.
6. June 26, 1942. Copper sales contract between Quincy and Metals Reserve Company. alls for Quincy to produce 30 million pounds of copper from reclaimed tailings over the course of 3 years. MRC o purchase copper and finance construction of plant.
7. July 27, 1942. Trust Agreement between Quincy Mining Company and Calumet ecla Consolidated opper ompany making C Trustee for the Quincy reclamation project. C to build reclamation plant as itself, not as trustee.
8. The final hree folders of this ox contain pense reports nd supply inventories relating to reclamation plant construction and dating from 1943 to 1944.

Subseries 4.5 Reclamation Plant Records, 1940-1968

Box 813
Folder 813/001: Index to Orders - Construction of Reclamation Plant, Aug. 1942 - March 1944

This folder contains a ledger book with descriptions of different orders and references to which folios contain them. The other folders in this box contain the folios to which this index refers.

Box 813
Folders 813/002 through 813/007: Orders - Construction of Reclamation Plant Folios 1-92, 1942-1944

These folders contain purchasing orders related to construction of the Quincy reclamation plant, subdivided into their original folios. These are orders made by C & H as trustee for the Quincy Mining Company. Much of this is minutia.

1. Sept. 11, 1942. *(Folio 13)* Westinghouse Electric Manufacturing o. E. C. ssner. This is a quote for supplying electrical equipment for the reclamation plant. The quote includes drawings and specifications sheets for a 3750 KVA transformer, which held 22,000 lbs of insulating oil. Also for outdoor oil circuit breakers, as well as misc. fixtures and ittings.
2. June 21,1943.*(Folio 81, in Folder 4)* Purchase order for the rilling f a four inch diameter, 100-foot deep drinking water well at the reclamation site.

Box 813

Folder 813/007 Orders - Construction of Reclamation Plant, Unnumbered Folios, 1942-1944

This folder contains a miscellany of different types of documents, including progress reports for early plant operations along with accounting data from plant construction

1. Nov. 15, 1943. C Quincy Reclamation Plant Progress Report. Four ball mill units went nto peration t. n a single hift basis and re operating continuously y he end of the month. The remaining two ball mills were up and running by Nov. 5. Remaining work to be completed included extending the plant's tailings launders farther into Torch Lake so re-deposited slimes would not enter the plant's pump intake.
2. Dec. 15, 1943. Extension of the tailings launder completed.
3. June 26, 1942. Blueprint map showing shore plant, conveyor belt, and regrinding mill. There are two of these. One has a general layout for a water intake system sketched on it, the ther as a sketched in sheet piling enclosure shown st of the shore plant.

Box 814

Folders 814/001 through 814/004: Reclamation Plant Cost Sheets, 1943-1947

These folders contain duplicates of cost sheets summarized in Table B.

Box 814

Folder 814/005: Reclamation Plant Cost Estimates

This folder contains various ledger sheets and typewritten reports concerning the estimated cost of running the reclamation plant.

1. Sept. 11, 1946. A map hand drawn in pencil, dated Sept. 11, 1946, showing planned dredging activity for September 1946 through July 1947.

SubSeries 6.2 Division of Labor Records

Box 186: Distribution of Labor Summaries -- Reclamation, Nov. 1943 - Dec. 1950

*This box contains ledger sheets accounting, on a monthly basis, for man-hours associated with various work posts within the reclamation plant. These are given in hours and in payroll amounts. There are also ledger sheets accounting for supplies used in the reclamation plant on a monthly basis, but these numbers are given as dollar figures as opposed to lbs. Materials accounted for include grinding balls, mill liners, **pine oil**, **xanthate**, **stoker coal**, and **smelter coal**.*

Box 190: Distribution of Labor Summaries -- Reclamation, Jan. 1966 - Oct. 1971

This box contains ledger sheets identical in character to those found in Box 186, but for a later time period.

1. May, 1967. This is the last month for which labor distribution figures are recorded. Later ledger sheets record only "shutdown expenses," which usually amount to very little in the later years.
2. Oct., 1971. This is the last month for which labor and supply data were recorded. Louis Koepel and Clarence Mayra were the only two employees remaining on the payroll.

Box 191-192: Daily Labor Distribution, Jan. 1964 - Dec. 1965
This box contains ledger sheets with similar data to what is described above, but recorded on a daily basis. There are also Daily Labor Distribution Sheets for the Smelter, identical to those described above, along with accounting for repair work. None of this is particularly useful for the project.

SubSubSeries 6.5.3 Employee Cards -- Later Sets, 1936-1972

Boxes 313 & 316
These boxes contain employee cards, which give basic personal information for Quincy employees, including ethnicity and the like. They are not relevant to the project.

Michigan Tech Archives & Copper Country Historical Collections
MS-002: Calumet & Hecla Records

SubSubSeries 4.4.38 (4.3.30): President's Office Alphabetical, A-Z, 1910-1969

Box 84
Folder 84/009: Quincy Mining Company — Re. Power Contract, 1946-1966
This folder contains various documents relating to Calumet & Hecla's role as provider of electricity to the Quincy Mining Company.

- For a time during the 1946 **coal** miners' strike, Quincy apparently supplied **coal** from its own ock o C & H so that C could continue to generate power for Quincy Reclamation.

1. June 13, 1960. R.L. Pierce to L. G. Koepel. In response to an inquiry from Quincy seeking lower electric rates, Pierce proposes Quincy could save money by shutting down its smelter and having C smelt its mineral. Associated handwritten note indicates Quincy was t all that nterested.
2. October , 953. ice esident and eneral Manager .G. epel. "We understand you may consider obtaining from us 1000 K.W., now furnished by your Diesel equipment. Our review included this possibility and we find we do have the additional 000 K.W. available n a continuous basis.

SubSubSeries 8.2.5 (8.2.5) Quincy Reclamation Project, 1940-1949

Box 521
Folder 521/001 "Quincy" (Reclamation)
This folder contains various document types related to planning and execution of Quincy Reclamation Plant construction. Similar to most of the other folders in this box, it is a very large folder, very full of documents in a poor state of organization. Its contents include:

- A table showing 46 men were working for the Quincy Mining Company between Sept. 1942 and July 1943.
- Accounting data
- Insurance information
- A safety inspection report

- Construction cost estimates
- Lists of equipment to be furnished by C
- Wage ates
- Tax records
- Materials sts or grinding lant and redge
- Trust Agreement between Quincy and C (multiple copies)

1. Quincy Reclamation Project Contract No. P-994. Inventory of buildings and equipment which comprise the Reclamation Plant as of Nov. 1, 1943. Of note is the electrical substation's equipment inventory **{See PDF2}**
2. Minutes of 10/21/1943 Meeting between Quincy Mining Company reps. and C . Quincy to assume control of Reclamation Plant on Nov. 1, 1943.
3. Sept. 7, 1943. C. . Benedict's proposal for the number of workers necessary to run the Reclamation Plant: 16 per shift (plus five extra for maintenance, etc., on the day shift) across redge, ore Plant, and grinding Plant. Grand tal f 8 rkers across shifts.
4. July 23, 1942. Project Rating Application to the War Production Board. This application includes a description of structures and equipment. Contains this related to the electrical equipment: "At the site of the regrinding buildings there will be installed a pole structure to support the necessary buss arrangement, etc., and at this point 3 single phase, oil filled, self-cooled, outdoor type transformers, oil circuit breaker, current and potential transformers, arrestors, etc. will be installed. The transformers will be 1667 Kva each, primary voltage 13,800, secondary voltage 2,400." And this: "Electric Power for the operation of the Quincy Reclamation project will be furnished by the Calumet ecla Consolidated opper ompany. And this list of materials needed for the project:

Table

Item	Unit	No. of Units	Value	Description of Use
167. Electric Transformers				
4,000 Kva	Each	1	$13,500	Transmission System
75 Kva	Each	3	$1,500	Secondary System
25Kva	Each	3	$750	Secondary System
7.5 Kva	Each	4	$500.00	Lighting System

5. July 13,1942. M.F. Keese (Bucyrus Erie Dredge Sales Manager) to D.L. Forrester (War Production Board). Describes electrical equipment specific to the Dredge consisting mostly of a variety of motors, but also switch gear and the following transformers: Three (3) 50Kva. 2,300/440 volts for power; ne (1) 7.5 Kva. 2,300/110 volts for lighting. is not specified whether the transformers were oil-filled or dry, located on shore or on the dredge itself.

6. Power Contract etween C & H and Quincy: "Upon completion of the aforesaid plant, and when Quincy shall commence operation thereof, Calumet will furnish such power as may be cessary perate e aid pant, but not xceed ive ousand 5,000) a. at any one time. It is understood and agreed that Calumet will supply power only to the extent that t an o o thout nterfering th ts wn perations . . . Type f ower: he power to be delivered by Calumet will be 13,200 volts, 25 cycle, phase . . . Delivery Point: The power shall e delivered to quincy and metered at a substation at the site of the oject.
7. Dec. 10,1941. Kiril Spiroff Map showing Mills, **Coal Dock**, unlabeled buildings. This map shows the historic evolution of the shoreline, labelled with stamp sand tonnages. Assay values are given corresponding to a sample grid also depicted on the map. Several similar maps to this one exist in the Quincy and C records. This one shows property lines.

Box 521
Folder 521/002
This is another large and fairly unorganized collection of C & H records related to the Quincy Reclamation project. This folder contains many purchase orders relating to construction of the plant.

1. July 13, 1959. Memorandum from Joseph F. Sablich, lawyer, "It is our opinion that the Quincy Mining Company owns the power line from Tamarack Reclamation Substation to Quincy Reclamation Substation, per conveyance dated December 29, 1947." A map in a packet of documents attached to this letter shows the Mineral Range Railroad from Quincy Reclamation to Tamarack Reclamation, though it cuts off just short of each facility. The map shows the power line between the two buildings. There is no indication of booster shed" hat I could find.
2. Aug. 30, 1944. H. Dewitt Smith, executive vice president of the Metals Reserve Company, to W. Parsons Todd. Letter approving and recommending installation of a thickener, a drag classifier, V-Tanks, a water adit and "other additions and improvements."
3. April 10, 1943. Purchase requisition lists asbestos-containing pipes and cement for the Reclamation Boiler ouse.

Box 521
Folder 521/003 Quincy Reclamation Contracts 1942-1949

1. Sept. 18, 1942. Quincy Reclamation Purchase Requisition **{PDF1}**

- "Electrical equipment for substation as per proposition No. MCW 48596 dated Sept. 10, 1942."
- Requisition covers the purchase of one (1) large transformer — 3-phase; type OAD 25; 3,750/5,000 Kva.; 25 cycle; Spec. P 51 52941-4 (GE Spec.?). This is the transformer depicted in General Electric Drawing No. T 5265296.
- Also covers nine smaller transformers. Six (6) are oil illed, ree 3) e ry."

Box 521

Folder 521/005: Quincy Mining Company, Misc. Correspondence, 1941-1944

This folder contains material very similar to that in Folder 521/004. There is also an interesting exchange concerning the early performance of the plant (see No. 2, below), but it is of little relevance to the project.

1. Sept. 8, 1943. C.H. Benedict to E.R. Lovell. etter describes startup costs for the Quincy Reclamation Plant. These include "operating supplies and necessary equipment" such as 40,000 lbs of **Sodium Xanthate** and ,000 gals. f **Pine Oil**.
2. June 3, 1944 to August 18, 1944. H. D. Smith (Metals Reserve Company), A. E. Petermann, E.R. ovell, . . . Benedict. In this eries correspondence, including letters and telegrams, Brown expresses discontent with production rates at Quincy Reclamation, stating the plant to date had only been producing roughly 60 percent of its anticipated capacity of 4,000 tons sand processed, daily, and 10,000,000 pounds copper produced, annually. own equests that C engineers inspect the facility and recommend corrective actions. Benedict writes to Lovell and Petermann that C made no guarantees as to production ates; that the plant *does* process ,000 tons ands per day when run at capacity, but had to that point run at capacity only infrequently. He recommends that Quincy should put together recommendations for improving plant production, and that C should review them. It is not clear what course of action was followed.

Box 521

Folder 521/006: Quincy Reclamation Project — Bucyrus Erie Company, 1942-1943

This folder contains various materials, mostly correspondence between C & H and Bucyrus Erie Company, related the Quincy Dredge and its launching. There is a blueprint showing the arrangement of lights on the dredge, and a wiring diagram, but it is for lighting only (no reference to transformers, etc.)

1. Sept. 10, 1942. M.F. Keese (Bucyrus Erie dredge salesman) to J. L. Steward (Federal Gov't). This letter relating o securing a preference rating for certain dredge equipment, including transformers. No specifics as to type of transformers are given, but this indicates transformers may have been installed on the dredge itself.
2. July 10, 1942. F. A. Ayer to W. J. Weiss (Bucyrus Erie Assistant Vice President). Letter requesting further description of Dredge equipment listed in application for priority rating, including transformers.
3. July 20, 1942. M. F. Keese to A.E. Petermann. Terms of Dredge sale. Electrical Equipment included three transformers of this description: "50 K.V.A., 2300/440 volts for power"; one transformer of this description: "7 1/2 K.V.A., 2300/110 volts for lighting." Still unclear whether these were on dredge on shore.
4. July 3, 1942. S. J. Weiss (Bucyrus Erie sistant vice president) to A.E. Petermann. Price of dredge was $169,645.00). Includes specification ating: The general design of the machinery units and dredging pump and arrangement of the dredge will be similar to that of Dredge #2 owned and operated by The Calumet and Hecla Mining Company at Lake Linden, Michigan.

Box 521
Folder 521/007: Quincy Reclamation Project — American Bridge Company, 1942-1943
This folder contains correspondence relating to the Quincy Regrinding Plant — specifically, to the dismantling and re-erecting at the Quincy site of Calumet & Hecla's regrinding plant. This folder also contains more correspondence relating to minutia of the project, such as priority ratings applications, etc.

- The regrinding plant, conveyor bridge, shore plant, nd dredging arm from C 's regrinding plant were apparently removed in entirety and re-erected t he uincy site.
- There are indications that some supplemental structural steel had to be furnished from other sources, and a portion of the structure was built from wood.

1. Aug. 22, 1942. D.E. Faust (American Bridge Company ontracting Manager) to E. R. Lovell. Adjusted price quote for work described above: $66,500.00.

Box 521
Folder 521/008: Quincy Reclamation Plant — Roland C. Buck, 1942-1949
This folder contains correspondence with and related to the Roland C. Buck Engineerig company, which was contracted to do site preparation work, foundation work, etc. for the Quincy Reclamation Plant at Mason, some work related to launching the dredge, as well as repairs to company housing to prepare the houses for Quincy Reclamation Plant workers, and later repairs to the Reclamation Plant, itself.

1. Nov. 7, 1944. R. C. Buck (Roland C. Buck Engineers) to E. R. Lovell. Describing plans to build an extension e hore plant to commodate "another 35 ft. diameter settling tank and some wood "V" slime settling tanks together with foundations for same."
2. July 9, 1943. E.R. Lovell to R. C. Buck.

Dear Mr. Buck,

Thank you for your letter of July 8 regarding the activities of the A.F. of L. representative. I suggest that you not recognize the union until they have concrte evidence that a majority of your employees here are members. In any event, I certainly hope that this thing can be stalled f o that increased ages ill not e necessary.

Yours ry uly,

Vice Pres. & Gen. Mgr.

Box 521
Folder 521/009: Government re Quincy, 1942-1943
This folder contains about a three-inch-thick stack of documents (mostly correspondence) between C & H and the War Production Board. Most of it is extreme bureaucratic minutia related to preference ratings and the like. There are a few progress reports and budget documents which make moderately useful reference to structures of interest to the project.

- Copper concentrates dried using an Oliver dry vacuum pump before being sent for smelting.
- Railroad tracks entered the regrinding plant through doors at the south end. An application for a code variance was made to accommodate doors of non-standard height.

1. Dec. 15, 1942. Quincy Reclamation Plant Progress Report. SHORE PLANT The d building from Tamarack has been razed and this material is at the site of the new structure. Considerable field fabrication is to be done before reerection can be begun."
2. Oct. 16, 1942. List of materials for Preference ting rder 19 h. Includes one (1) outdoor oil circuit breaker, 15 Kv., 700 ampere, 250,000 Kva. interrupting capacity with tripping and closing mechanism; two (2) 15,000 volt outdoor current transformers; two (2) 15,000 volt outdoor potential ransformers.
3. Oct. 24, 1942. Quincy Reclamation Plant Progress Report. "REGRINDING and FLOTATION PLANT Concrete building foundations and column bases have been installed. The old building at Lake Linden from which steel is being furnished has been completely dismantled and all steel has been transferred to the site. Erection of the building tarted n tober 9."

Box 522
Folder 522/001: Government, WPB, RE Quincy, 1944

1. March 28, 1944. E.R. Lovell to S.H. Peterson (Metals Reserve Company). This is C 's final financial statement as trustee for the Quincy Reclamation Project. It asks what should be done with $5,109.38 in surplus funds.
2. June 6, 1944. D.L. Forrester to F.H. ayes (WPB Primary Production Branch chief). Letter discusses continued operation of Reclamation Plant somewhat below expectations, specifically with regard to slimes. Mentions a flow sheet C. . Benedict created **{PDF14}**.

Box 522
Folder 522/002 Michigan College of Mining & Technology — re. Quincy Reclamation
This folder contains reports and correspondence form the Michigan College of Mining and Technology relating to the Quincy Reclamation Plant.

1. Sept. 12 to 19, 1940. "Report of Mill Test on Quincy Tailing."

• "The object of this test was to determine whether the combination of **sodium ethyl xanthate, sodium sulfide, mahogany sulfate,** and **fuel oil** would make satisfactory recovery of copper from the tailing." This is an attempt to solve the problem of reclaiming oxidized stamp sand.

2. July 17, 1935. W. O. Hotchkiss to C. L. Lawton:

Tech udents nd faculty "spent a considerable amount of time on research with regard to the sands . . . In my opinion, the recovery of the copper from these sands has been for some years close to the margin of commercial possibility, and a careful watch should be kept of all processes developed which might change the picture from one of doubt, as at present, to a cture f easonable rtainty f ofit. ot nly hould is watch pt or ocesses developed elsewhere, but the fact that there is nearly a billion pounds of copper in these sands offers a problem of sufficient magnitude to make it worthwhile to carry on research looking toward commercialization. I am sure the college will be glad to cooperate in anything that may aide to this end."

3. March 3, 1942. G. C. Dillman to F. A. Ayer (Copper Branch of the War Production Board). Letter describes tests conducted on Quincy sands and results with maps. "From the Quincy Mining ompany Records we found that 4,429,000 tons of tailings were deposited prior to 1902. Between 902 and 910 an additional ,036,000 ns f tailings re eposited."

4. April 29, 1942. Dillman to Lawton. "Report on "Proposed Reclamation Plant, Quincy Mill Sands." This report describes the necessary equipment for processing the Quincy Mill Sands. New building construction is limited to a dredge and shore plant. The proposal calls for using Quincy's existing No. 1 Mill for regrinding purposes and locates the shore plant much farther north, in closer proximity to the No. 1 Mill, than the location where e hore plant was actually built. The proposal oes not call for construction a regrinding plant. All of this confirms the interpretation that, prior to entering into a finance agreement with the federal Metal Reserve Company, Quincy had planned to utilize its existing mill for reclamation of its stamp sands.

Box 522
Folder 522/002 Michigan College of Mining & Technology — re. Quincy Reclamation
This folder contains reports and correspondence form the Michigan College of Mining and Technology relating to the Quincy Reclamation Plant.
1. Sept. 12 to 19, 1940. "Report of Mill Test on Quincy Tailing."
• "The object of this test was to determine whether the combination of **sodium ethyl xanthate, sodium sulfide, mahogany sulfate,** and **fuel oil** would make satisfactory recovery of copper from the tailing." This is an attempt to solve the problem of reclaiming oxidized stamp sand.
2. July 17, 1935. W. O. Hotchkiss to C. L. Lawton:
Tech students and faculty "spent a considerable amount of time on research with regard the sands . . . In my opinion, the recovery of the copper from these sands has been for some years close to the margin of commercial possibility, and a careful watch should be kept of all processes developed which might change the picture from one of doubt, as at present, to a cture f easonable rtainty f ofit. ot nly hould is watch pt or ocesses developed elsewhere, but the fact that there is nearly a billion pounds of copper in these sands offers a problem of sufficient magnitude to make it worthwhile to carry on research looking toward commercialization. I am sure the college will be glad to cooperate in anything that may aide to this end."
3. March 3, 1942. G. C. Dillman to F. A. Ayer (Copper Branch of the War Production Board). Letter describes tests conducted on Quincy sands and results with maps. "From the Quincy Mining ompany Records we found that 4,429,000 tons of tailings were deposited prior to 1902. Between 1902 and 1910 an additional 5,036,000 tons of tailings were deposited."
4. April 29, 1942. Dillman to Lawton. "Report on "Proposed Reclamation Plant, Quincy Mill Sands."
This report describes the necessary equipment for processing the Quincy Mill Sands. New building construction is limited to a dredge and shore plant. The proposal calls for using Quincy's existing No. 1 Mill for regrinding purposes and locates the shore plant much farther north, in closer proximity to the No. 1 Mill, than the location where the shore plant was tually built. he oposal oes t all for construction of a regrinding plant. All of this confirms the interpretation that, prior to entering into a finance agreement with the federal Metal Reserve Company, Quincy had planned to utilize its existing mill for reclamation of its stamp sands. This plan was not implemented. The report contains maps, drawings, and a flow sheet related to Quincy's old plan of building its Mill No. 1 into a Reclamation Plant.

Box 522
Folder 522/003: Quincy Mining Company Engineering Department Addresses Index, No Date
This folder contains the Quincy Engineering Department's address book with names of contacts including contractors and others, such as C & H personnel. It is of possible interest to the project if we really need to identify a particular person.

Box 522
Folder 522/004: Quincy Reclamation Plant — Dredge, 1942-1943
This folder contains materials and equipment lists and other, similar documentation related to the Quincy Dredge. Many of these documents consist of handwritten notations and calculations with inscrutable meanings. Included timber lists break the timber requirements down by type of wood (Pine, Fir, Hemlock, Spruce, etc.).
1. No date. Handwritten notations about transformers:
 3 Transformers on 2 Pole Tower near Shore Plant
 GE Co. 1 Single Phase 25 KVA Form KF Voltage Rating 2400/4160Y - 240/480 No 7096605
 - 1 Single Phase 25 KVA Form KF Voltage Rating 2400/4160Y - 240/480 No 7096604
 - 1 Single Phase 25 KVA Form KF Voltage Rating 2400/4160Y - 240/480 No 7096604
 Transformers at main Sub station
(Item has red "X" in in colored pencil, possibly indicating these items were acquired)
2. No date. Handwritten notations about transformers:
 GE o Transformer
 EE QE 2001
 Order QP 5006
 No 7152313 Type OART Form Cyc 25
 Voltage Rating 13800 2300
 Continuous Rating 3750 KVA
 Supplemental Rating 5000 KVA Sub Sta

 GE Co - Transformers -
 No 6583952 Type H 75 KVA Form KF 25 Cyc 2400/4160Y 240/480
 No 6583951 Type H 75
 No 6583953 Type H 75 Sub Sta

Box 522
Folder 522/005: Quincy Reclamation Plant — Coal Scow Repairs, 1943
This folder contains documents of workmen's hours that went into the repair of a C & H ***coal*** *scow, presumably for use by Quincy.*

Box 522
Folder 522/006: Quincy Reclamation Plant — Reports from Hermann Hardware Co., 1943
This folder contains invoices and sales inventories for labor and material Hermann Hardware Co. (Laurium) sold to C & H for work on the Reclamation Plant.

Box 522
Folder 522/007: Quincy Reclamation Plant — Proposal, Blueprints, Correspondence, 1942-1945
This folder contains proposals from suppliers relating to equipment for the Reclamation Plant (Filters, Classifiers, Conveyors, etc.); blueprints of equipment; and promotional literature relating to equipment.

Box 522
Folder 522/008: Quincy Reclamation Plant — Proposal, Blueprints, Correspondence, 1942-1945
This folder contains similar documents to those found in Folder 522/007. Additionally, there are proposals/bids from the American Bridge Co. and the Worden Allen Co. for the dismantling and re-erecting of C & H's No. 1 Regrinding Plant, its Shore Plant, and Conveyors.

Box 523
Folder 523/001: Quincy Requisitions Alteration Sheets
This folder contains one document that is a list of alterations to be made to requisition orders by the C & H Drafting Department relating to the Quincy Reclamation project.

Box 523
Folder 523/002: Quincy Reclamation Plant Misc., 1942-1944
This folder contains various correspondence related to the actual construction of the Reclamation Plant, including numerous progress reports made by contractor Roland C. Buck while construction was under way.

1. Jan. 11, 1943. H. E. Williams to D.E. Faust (American Bridge Co.). Letter reclaiming structural steel from the Quincy Reclamation project, directs contractors re erecting regrinding plant to substitute timber for the steel.
2. Oct. 9,1942. .E. Yager Bucyrus Erie) to R.C. Buck. Lead paint used to coat dredge hull. "I have talked to a number of men here who have had some experience in building wooden ulls and ey agree th ohn arlson that a heavy coat of white lead paint is satisfactory, provided: 1) A first class job of caulking is done; 2) A spray gun is used to insure thoroughly covering the caulking seams with the white lead."
3. Sept. 4, 1942. Report from Michigan College f Mines:

Table

Quincy Reclamation Plant		
Copy of Report on Sand From Quincy Tailings Bank		
Sieve Size	% Passing	Hiway Spec. % Passing
4	99.5	90 - 100
10	79.7	60 - 90
20	43.8	25 -60
50	16.8	7 - 25
100	5.5	0 - 5
Clay & Silt	1.2%	2 1/2%
There is some ash and coke present in this sand.		
H. Hawn		

4. July 24, 1942. H. E. Williams to C. L. Lawton. Letter stating Williams is sending the following drawings related to the Quincy Reclamation Plant:

Table

Drawing	Description
10491	Regrinding Plant, Longitudinal Sections
10492	Map
10493	General Arrangement of Regrinding Plant, Conveyor & Shore Plant
10494	Regrinding Plant Cross Sections

Box 523
Folder 523/003: Quincy Reclamation Plant Pontoons, 1942-1943
This folder contains correspondence mostly relating to materials acquisition for the construction of pontoons to carry the pipeline joining the Dredge to the Shore Plant.

Box 523
Folder 523/004: Quincy Reclamation Plant — Regrinding Plant, 1942-1944
More correspondence with equipment suppliers and contractors relating preparations for installation of equipment. Major projects (projects mentioned repeatedly) include installation

of a foundation for a 24-foot Dorr Thickener, and construction of a substructure for the Regrinding Plant's surge bin, which failed and was redesigned and rebuilt. The surge bin would eventually collapse, killing at least two Quincy employees, years after the plant went into operation.

Box 523
Folder 523/005: Quincy Reclamation Plant — Shore Plant & Conveyor, 1942-1949
This folder contains much more correspondence, and a few drawings, relating to details of construction work on the shore plant and especially the conveyor (including Weigh-o-meter portion of conveyor).

Box 523
Folder 523/006: Quincy Reclamation Plant, 1944
This folder contains some correspondence relating to a water supply pump and booster pump for the Reclamation Plant. Also, the August, 1944 edition of Excavating Engineer *magazine, containing an article about Quincy's dredge.*

Box 523
Folder 523/007: Quincy Reclamation Plant — Dredge, 1942-1955
This folder contains more correspondence relating to the engineering, design, construction, and, to a lesser extent, launching of the Quincy dredge.

Box 523
Folder 523/008: Quincy Reclamation, 1942-1944
This folder contains more correspondence and a few materials lists, etc., related to preliminary work for setting up the Reclamation Plant.

1. Undated. Another document describing the electric system for the Reclamation Plant, which seems to indicate the Dredge may have had an il rcuit eaker" n ard. However, it is not absolutely clear from the document whether the breaker was located on oard he dredge or on the shore. **{PDF15}**

Quincy Mining Company Annual Reports: President's and General Manager's reports to Stockholders

Annual Reports from 1888 to 1941 concern the mills only. Post-1947 annual reports deal exclusively with the reclamation plant. The mill and reclamation plant operated concurrently from 1942 to 1947.

1888
S. B. Harris, agent: Work on a new stamp mill at Torch Lake began in August. The mill building itself was 120 x 200 feet and initially housed two steam stamps. **{PDF31}**

1889
Harris: Work continued, and perhaps was completed, on mill construction. Company houses ere lso erected. To ilize he ater from the two little creeks near the mill a run

of launders, some eighteen hundred feet in length, altogether, was laid from the creeks to a tank in the mill. The water thus obtained will always be enough to feed the boilers, and during the Spring and Fall there will probably be sufficient to supply one, if not two heads of stamps. The boilers pumping engine, pipes, and most of the mill machinery are now in working order and we expect to have the mill ready for active service by March 1st, next." Quincy & Torch Lake Railroad also under construction.

1890
Harris: "The principal building and construction done during the year was as follows: At Torch Lake; the completion of the stamp mill, pumping engine, and fire plant; the placing of two ditional x 16 feet return tubular boilers; the building of about four hundred feet of elevated tramway from mill building to our railroad; the extension of dock 100 x 36 feet for handling abs nd cordwood; nd he erection of ten dditional elling houses for employees."

1891
Harris: An addition of 200 by 40 feet was made to the dock; the boiler house was expanded 40 feet and new boilers added. Also another 10 million gallon pumping engine purchased and installed to service the mill. The stamp mill itself had three heads of stamps at this time; the mill was extended 80 feet to accommodate two additional 20-inch cylinder stamps, these manufactured by E.P. Allis & o.

1893
Harris: Tunnel built between mill building and pump house.

1894
Harris: "Jones's nderfeed chanical okers" installed in the oiler house.

1895
Harris: New dwelling houses and some waterworks improvements.

1898
Harris: Site has been selected for a second mill at Mason, 630 feet north of the No. 1 mill. A steel bridge 122 feet long was contracted or, rossing e orth reek" and ading e No. 2 mill site. The No. 2 mill building would be 132 feet by 216 feet and made of steel. It would hold three heads of steam stamps. Water would be fed to the mill by means of a 16 million gallon pump.

1899
Harris: The new steel mill building "practically completed." Pump house also nearly finished, this a building made of dimensions 54 feet square of brick and steel. "An adit seven feet by seven and one half feet y one hundred feet in length as uilt of masonry from the lake to the pump-house. A dock, 40' x 216', was also built at the new mill, together with estles, oal ard, and e cessary appliances or unloading and andling oal."

1900
Harris: Two heads of stamps up and running by the end of December in the No. 2 mill. The third stamp was running by January, 1901.

1901
Harris: Wilfley tables replace "old style slime tables" at No. 1 mill. Also, "During October a contract was made with the American Bridge Company and the John A. Mead Company, for the rection f **coal unloading and storage plant**, at our stamp mills, at Torch Lake. This plant consists three teel towers, each having a guaranteed unloading capacity, under favorable conditions, of one hundred and thirty five tons per hour; and a steel hed, three undred and ighty five feet long by three hundred and one feet in width, having a storage capacity of about seventy thousand tons. The equipment is to be ready for service by May irst, xt."

1902
Harris: Both stamp mills in operation. Several improvements to machinery were made. "A number six Chilian Mill 'Monadnock' was recently installed with the necessary accessories for grinding and treating the coarse sands from the roughing jigs." The new coal dock and "coal oisting plant" was completed. All coal for the boilers at the mill and mines was to be unloaded and handled at this ock, and ansported on the Quincy & Torch ake ailroad.

1903
Harris: arious improvements to milling technology made in order to reduce loss of copper to and tailings.

1904
Harris: "A mineral house, seventy feet by twenty feet, was built at west end of number one stamp mill, and contains six storage bins of about twenty-five tons capacity each. Mineral from number one mill is handled by the trolley system and transported direct to storage bins." More improvements to stamping and washing/separation equipment.

1905
Charles L. Lawton: Improvements continue at the mill.

1906
Lawton: "A trial Hawley down draft furnace was installed under the Wickes boiler, th at the mine and mill, and have shown excellent economy." At the No. 2 stamp mill "An experimental re-crushing ant or unit erected and is being atched ith considerable interest."

1908
Lawton: Additional equipment improvements at the stamp mill, particularly to No. 1 mill, which was till n peration but apparently howing ts age.

1910
Lawton: New launder built for the No. 1 mill.

1911
Quincy engaged in continual, minor upgrades to its milling operation over the past decade or so. This presumably led to less copper being redeposited with the tailings.

1915
Lawton: Two Hardinge ball mills ordered and one installed in each mill. "A concrete foundation has been built at No. 1 mill boiler plant for a ten-foot by one hundred and seventy five-foot concrete stack to be erected in the spring. A new Stirling boiler and five Taylor okers ve een purchase o furnish additional power nd increase he efficiency of his ant."

1916
Lawton: A modern assay office twenty-six feet by forty eight feet is being erected t he stamp mill. Most of the equipment for this new office will be transferred from the mine assay office, except that a more modern gasoline furnace will replace the old coke wind furnace." Concrete stack one hundred and seventy five feet high completed and "has effected an economy in coal consumption."

1917
Lawton: "The **coal** handling machinery mentioned in last year's report was installed, and now conveys the **coal** to the crushers and elevates it to a large storage bin from which it is fed to the Taylor stokers. The installation also handles the **coal** from the shed to the No. 2 boiler plant, and s oing is rk atisfactorily." hus, oal nger eded transported by rail car at the mill complex. Also, a new 30 inch ater pipe was installed from the main pipe line to the mill.

1918
Lawton: Extensive additions and improvements to both mills. **{PDF32)**

1919
Lawton: Additions to the stamp mills completed in May. Two Dorr Classifiers to be installed.

1920
Lawton: Stamp heads have been equipped with either Marcy or Hardinge ball mills with associated slime tables, etc. Two electric motors installed at the No. 1 mill for operating rolling mills. "Ten cargoes of bituminous and two cargoes of anthracite **coal** were unloaded at e coal shed."

1921
Lawton: No. 2 mill was closed January 4th, remained idle the rest of the year. Stamping confined to the No. 1 mill.

1922
Lawton: No. 2 mill remained idle. "In June, contracts were placed with the General Electric Company for a 2000 KW mixed pressure steam turbine and generator, consisting of 1500 KW w essure blading and 00 KW high essure blading gether th all accessories, consisting of a 35 KW urbo driven excite o e used as a starter unit and for lighting hen the large turbine is idle . . . The turbine plant will utilize exhaust steam from the simple stamp heads for the operation of the regrinding plant and other purposes in the stamp mills . . . The building for the turbine is two stories, of reinforced concrete, brickfaced, thirty six by thirty eight feet, nd forty five feet hight, with a traveling crane of sufficient capacity to handle the machinery in erecting."

1923
Lawton: "Turbo-generator" plant construction completed. This has created efficiencies resulting in lowered **coal** consumption.

1927
Lawton: Tailings osses of about 4.42 pounds per ton. Still only one mill in operation, it seems.

1928
Lawton: Three Fahrenwald oil otation" units being installed at the stamp mill.

1929
Lawton: omplete otation units installed and put into peration at 1, , and eads. Extensive repairs made to **coal** dock. Production must be down substantially, because only one small furnace is in operation down at the smelter.

1930
Lawton: At No. 2 head a complete otation equipment was nstalled, ollows:—

One 4 in. welve-cell flotation machine,
One ft. x 18 ft. Dorr classifier,
One 2 ft. x 7 ft. concentrate Dorr thickener,
Three agent eeders

It is expected this parallels the installations made at heads 1, 3, and 5 the previous year.

1937
Lawton: Quincy's entire operations having been idled by the Great Depression for more than five years, work resumed in October of 1936, including repairs to the mill and coal dock at Mason. Louis Koepel took over as mill superintendent on May 15, 1937 after graduating from the Ore Dressing Department at the Michigan College of Mining & Technology.

1938
Lawton: Stamp mill reported to be in need of major repairs and upgrades.

1939
Lawton: Repairs being made to stamp mill and associated uildings.

1940-1941
Lawton: Nothing new to report.

1942
(This is the first reference to the Reclamation plant in the Quincy annual reports)
W.P. Todd and C. M. Lawton both describe initial construction of Reclamation Plant. See scanned documents section. **{PDF4}**

Lawton (Mills): "The Stamp Mill operated under excessive repairs and renewal expenditures."

1943-1944 (Missing from Archival Collection)

1945
Todd (Reclamation Plant): Plant in continuous operation seven days per week hroughout 1945.
Lawton: Reclamation Plant recovered 5.58 lbs of copper out of an available 7.96 lbs per ton of nd (70.1 percent traction). Post process tailings till contained .18 lbs copper per ton. Quincy treated 1,087,515 tons of sands in 1945, so an estimate of copper redeposited in post-reclamation tailings for **1945** would be 2,370,782 lbs or approx. **1,185** tons. *These figures can be computed for 1943-1967 using metallurgical data found elsewhere in the Quincy records.* Lawton also reported construction of a 41 foot by 48 foot addition o the hore plant housing two "W Tanks."

Lawton (Mills): "Due to the closing down of the Stamp Mill on September second it was necessary to make the following changes and installations at the Reclamation Plant.

"Two entrifugal ire umps with 60 cycle motors, fire hydrant and required pipe lines were installed at the Plant. To operate these pumps it was necessary to construct a 1000 foot power line to obtain the proper current. There is now available, in case of fire, 1000 gallons of water per minute at 95-lb. pressure at the Mill and 1400 gallons per minute at 5-lb. pressure at the Reclamation Plant.

"Three of the dwelling houses adjacent to the Plant were remodeled to be used as an office, ectric shop, and ractor shed. Part of the machine shop at the Mill was closed off and a furnace installed. A heatrola was placed in the Mill assay office and an electric oven was installed at the plant for drying samples. Heretofore the mill boilers had supplied the steam for heating and for drying samples."

1946
Todd (Reclamation Plant): Plant osed in May in June "because of our inability o secure power or its operation ue to the **coal** mines being closed by strikes." Richer stamp sands are already becoming exhausted, transition to reclaiming lower grade stamp sands is anticipated or e uture.

W. Parsons Todd (Mills): "During e hut-down period at the Reclamation Plant an eight cell No. 24 Denver Equipment Flotation Machine from No. 1 Mill and a set of Allis Chalmers Liners were installed, which improved the general efficiency of the plant." (Coal strikes had idled he ant for a six week riod n May and une, 946)

1947
Todd (Reclamation Plant): "High grade" stamp sands are the sands from the No. 1 mill deposits from prior to 1908.

(This is the last reference to the mills in the annual reports)
Todd (Mills): "Expenditures in connection with our mining property have been confined, during the past four years, to the maintenance of the property, payment of taxes, insurance and minor repairs to dwellings and other buildings, including the water system."

1948
Todd: "For the past three years mineral produced at the Reclamation Plant has been smelted on a toll basis at the Calumet ecla Smelter, Hubbell, Michigan. Due to their needing he pacity of their refinery for their n operations, his contract as ncelled by the Calumet ecla ompany as of June 30 last. There was no other smelter in operation in the district, therefore, this cancellation necessitated our building a small furnace at the Quincy Smelter to handle the production of the Reclamation Plant. It took considerable time to build and put this furnace into operation as our smelter had been idle since 1931."

(*Post-1947 annual reports contain no further references to the mills.)*

1949
Todd: Plant in continuous operation, as it has been every year except '46. "Our Power Consumption is about 1,500,000 KWH per month, therefore the cost of power is a very important part of our operating expenses." It seems they are getting the majority of their power from C .

1949
Todd: Continuous operations. Nothing of note reported.

1950
Todd: Continuous operations. Nothing of note reported.

1951
No new information.

1952
Todd:
- Reclamation Plant is still working on sands from the No. 1 Mill (The Old Mill). These sands contain a proportion of oxidized copper, because some of the sand is above the waterline. Sands from the No. 2 Mill are expected to last 5 years.

- Preparations o reat No. 2 tailings are under way.
- New booster pump installed to move tailings a greater distance from the dredge to the shore (Bucyrus Erie 20-inch centrifugal pump)
- 1,000 HP diesel engine installed, attached to a 1,000 KW Ideal generator to run booster pump. Engine described as 10-cylinder engine, same as engine eing installed in photographs in the Louis Koepel photo collection at KNHP.

1953
Todd:
- There was a fire in the pump house in February. "Our main water supply pump overheated and set fire to the pump house." This resulted in a seven-day shutdown.

1954
Todd:
Nothing new to report.

1955
Todd:
Nothing new to report.

1956
Todd:
- Quincy's redge unk n anuary. ortunately or Quincy, ey ad just purchased ne f & H's used dredges for $81,688.35. Divers looked at the Dredge and decided it would be too expensive to lift it out of the lake, so they left it there at the bottom.

1957
Todd:
Nothing new to report.

1958
Todd:
- Plant was idle Jan. 3 to Nov. 3, but maintained in operating condition.

1959
Todd:
- The depth of the stamp sands being worked is complicating their removal.

1960
Todd:
Nothing new to report.

1961
Todd:
Oxidized copper sands continues to complicate production. Todd had previously reported Quincy's equipment was relatively ineffective in treating oxidized copper sands.

1962
Todd:
- The sand storage bin in the Reclamation Plant, or "surge bin," collapsed, killing two employees, on May 31.
- The plant returned to operation in September.

1963
Todd:
- All stamp sands are now coming from the No. 2 Mill's deposit.

1964
Todd:
- The uincy ine oist Association has been organized.

Michigan Tech Archives & Copper Country Historical Collections
MS-173 Louis Koepel Collection
An enigmatic collection comprising one box and one folder. The folder contains blueprints for a house in East Hancock. The box contains:
- Photocopies of the Securities and Exchange Commission's Annual reports for 1976 for the Copper Range Company and the Louisiana Land and Exploration Company.
- Photocopies of the SEC's Universal Oil Products annual report for 1968. This is seemingly a rich source of financial data and not much else.
- Two very handsome patent document sets for the Woodbury Benedict ig one th ribbon and seal affixed)
- Three catalogs (one catalog in three parts, actually) for an auction of William Parsons Todd's stamp collection.
- One magazine, published by a hardware store supply company, containing hardware ads and articles targeted at men.
- One catalog or harging Plugs and ceptacles" inted th absolutely ensational graphic plates.
- One catalog or taps, dies, and screw tapes.

Keweenaw National Historical Park Archives
Quincy Mining Company Records Collection

By and large, materials at KNHP related to the Quincy Reclamation Plant duplicated documents already recorded from the Tech Archives. The report replicated below is one exception.

SubSeries 004.08: Reclamation Plant

Box 203
Folder 203/069: Report on Requirements for Reclamation Plant, July 1928
This folder contains an eight-page hand-written report (which was probably typed up subsequently) on facility, equipment and power requirements for the construction of a Reclamation Plant to treat the Quincy mill tailings. It is reproduced in its entirety below and provides insights on a number of levels, not least of these being that it demonstrates the early time at which Quincy began thinking seriously about reclaiming its stamp sands. It is also informative for its descriptions of the reclamation process and the machinery, power, and supplies required.

Jul 21, 1928 (Stamped)
Reclamation Plant

Fred,

Attached blueprints of sand dump gives tonnages ad assays, the latter being made from samples taken by ____ (begins with "d") pipes.

Table___

Stamp Sand Copper Content			
Deposit	Tons Sand	Assay	Pounds Copper
#1 Dump	19,619,000	7.47	146,554,000
#2 Dump	9,600,000	7.1	67,160,000
Total	29,219,000	7.31	213,714,000

The following table shows the tonnages and percentages of sand which will be removed if dredging is confined to certain depths of water.

Table___

Capacity of Dredge	#1 Dump		#2 Dump	
	Percentage	Tons	Percentage	Tons
30 feet	42.4	8,250,000	61	5,850,000
50 feet	82	16,100,000	85	7,160,000
70 feet	100	19,600,000	100	9,600,000

The following is a description of plant necessary o recover 3,000 tons of sand per day, regrind it and treat it by flotation n e esent ll Building.

This plant requires equipment to recover the sands from the lake, and by dewatering and classifying devices, prepare it for metallurgical treatment and then deliver it at the necessary elevation in the mill where it will be reduced in size to about 20 mesh and treated in flotation machines. Tailings from these machines will be classified and the richer, coarser portion treated on tables.

The ttached ow sheet nd he following description gives details of the process.

Dredge The dredge will be located in the lake, and will be capable of pumping 3,000 tons f and n ours. It will ave a depth apacity ufficient ecover all the ands which now have a maximum depth of 70 feet below the surface of the lake. Its equipment will consist of ______ ("ladder"?) for suction pipe, main suction pump, circulating water pump for cod weather, control winches for moving or anchoring dredge, heating plant and other small auxiliary apparatus. All power units will be electric motors.

Pontoons Pontoons connect he dredge with he sand bank and carry the discharge pipe and electric power lines. Some permanent pipe and power lines will go to the main shore.

Shore Plant Shore Plant will receive all material dredged from the lake. This will pass over screens to remove coarse rubbish, and be delivered to the Pool, which will have a capacity of three or four day feed. From the Pool, the sand will be pumped to settling tanks protected by fine screens. At this point the fine rubbish is removed and the water overflowed; the spigots of the tank containing all the sand and slime and some water. This spigot product will then be classified into sand and slime, the sand being in a comparatively dry state, suitable for transportation on an inclined belt, and the slime being pumped to the mill by centrifugal pump.

The two products Sand and Slime are now ready for treatment.

The sand will be ground in the ____ (seven?) ball mills to about 20 mesh, from which it ill go to hrenwald otation machines. The slime will be thickened in four 30 ft. Dorr Classifiers to a density of at least three parts water to one of solids, when it will be ready for Fahrenwald flotation machines.

Flotation treatment of sand and Slime feed is similar, and the two may even be mixed in the same machine. Mr. Fahrenwald recommends the 18" Special 8 cell machine, having a capacity of about 250 tons per day. Twelve of these machines are therefore necessary for 3,000 tons.

Each machine makes a finished mineral; and its middling is retreated by the machine itself. The tailing product will contain the copper which is coarser than about 48 mesh, which cannot be raised by flotation. Therefore this tailing will be classified to remove the iner rtion about two thirds f t) hich ill e aste. This coarser portion bout 950 tons) will then be treated on tables, at the rate of 40 to 60 tons per table. About thirty of the present tables will be necessary for this step, including mineral redressing tables. Table ailings ill waste.

Table __

Equipment for Reclamation Plant	
Equipment	Cost
Dredge for 50 feet depth	$ 150,000.00
[70 feet depth $200,000]	
Pontoons from dredge to sand bank	$ 42,000.00
Pipe lines from dredge to shore plant	$ 40,000.00
Pole lines and electrical transmission from Dredge to Power Plant	$ 35,000.00
Shore Plant	$ 80,000.00

Conveyor and building from Shore Plant to Mill	$ 58,000.00
Four Ball Mills from #1 Mill	$ 40,000.00
Classifiers tanks etc	$ 25,000.00
Flotation Machines {12-18" special, 8 cell}	$ 40,800.00
Oil Feeders	$ 500.00
Freight	$ 4,000.00
Installation	$ 2,500.00
Reconditioning Mill Equipment	$ 10,000.00
#2 Main tailing launder outside of mill	$ 3,000.00
Total	$ 530,800.00

Table

Reclamation Plant Power Requirements		
Facility	Peak Load KW	Daily K.W.H
Dredge	1000	9000
Shore Plant	125	3,000
Belt Conveyor	100	2,400
Ball Mills	800	19,200
Flotation Machines	192	4,600
Dorr Thickeners and Classifiers	100	2,400
Pump, Elevators, and _____ (begins with F)	125	3000
Tables	30	720
Total	2472	44,320

All power for Reclamation Plant will be electric, so that total electric power for entire plant would ,

Table

Electrical Power Consumption Estimates	
Facilities	K.W.
#1 Mill, present load of four heads at 600 tons, Boiler houses, Shops, Lighting, etc.	1,000
#1 Mill increased requirements, for larger Ball mills and Flotation equipment	515
Reclamation Plant requires for Dredge, Shore Plant, Regrinding and Flotation	2472
Total	3987

If the present turbine plant furnishes power for the mill and Reclamation Plant only and the Power Factor of the Mill Power System can be raised to 90 %, we may expect a capacity of 2200 K.W. from the urbine.
As the total requirement will be 3987 K.W. then 3987 minus 2200 or 1787 K.W. must be obtained from some other source. This may be obtained from local power company or produced by additional turbine capacity. A 1500 K.W. high pressure turbine, run in connection with present turbine would take care of the Stamp Mill load.

Oral History Interview Summaries

Interviewee #10: RK
Conducted by Daniel Schneider
August 2, 2014
Topic: is memories of the Quincy Mining Company's reclamation plant.

RK worked at the Quincy Reclamation Plant intermittently during the late 1950s and early 1960s. This work included general maintenance at the industrial facilities as well as on company-owned houses in Mason. During the summer of 1959, RK worked specifically on dredge maintenance. He also did clerical work for a time in one of Quincy's offices during the company's last decade in operation. Work on the dredge included moving the pontoon assemblies which carried the dredge's feeder pipe, as well as attaching lighting wiring each time the dredge was moved. RK did not participate in connecting the large electrical line that ran the dredge's pumping machinery, a task reserved for Quincy's industrial electricians. RK said each the Hardinge ball mills in the reclamation plant held eight or 10 tons of the hardened steel balls that were used to pulverize stamp sand into a fine powder amenable to extraction by flotation. He described the flotation process in detail, which informed the process description in the Quincy reclamation plant narrative found in this report. RK remembered the water of Torch Lake always being turbid red. He was shocked to see the blue water in the lake when he returned to the area for a vacation decades after all of the copper processing facilities on Torch Lake had shut down. RK said Quincy's buildings at Mason remained standing for several years after the operation ceased.

Key Points:

- **Xanthate** and **pine oil** were the only chemicals used in the flotation process at the Quincy regrinding mill. Earlier flotation operations had used a chemical reagent derived from creosote, ut **xanthate** had replaced that chemical long before the reclamation plant was built.

- Post-reclamation tailings were deposited in Torch Lake on the south side of the reclamation plant site (the stamp sand being reclaimed was located to the north of the facility).

- Quincy had attempted to cover over nd vegetate s post-reclamation tailings pile using sewage sludge trucked in from Hancock.

- Most of Quincy's buildings at Mason remained standing for years after the operation ceased.

<u>Interviewee #10: BK</u>
Conducted by Daniel Schneider
August 11, 2014
Topic: Recollections of working as an electrician at the Quincy reclamation plant

In the 1960s, during the Quincy Mining Company's final years, BK worked at the company's reclamation plant at Mason, on Torch Lake. He worked as an electrician during most of the time he was employed there, but also worked on the dredge that pumped stamp sand from the bed of Torch Lake.

He described reclamation as a mostly automated process, with a small group of employees tending machinery such as ball mills, flotation equipment, and Wilfley tables. He said the equipment is Quincy's reclamation plant was outdated ("Relics" is the term he used).

BK's father also worked for C&H, trucking mineral from the mills at Mason to the smelter in Ripley. BK recalls after Quincy's reclamation dredge sunk, in January of 1956, the company tried to retrieve the machine from the lake using bulldozers and cables, but these efforts iled.

BK was working for Quincy when the surge bin at the reclamation plant collapsed, killing two workers. The surge bin was tank at the north end of the reclamation plant which held incoming stamp sand from the shore plant, functioning as a reservoir to preserve the consistent flow of sand through the regrinding mills. BK was not in the reclamation plant at the time the bin collapsed, but he remembers the entire floor of the facility being buried under a layer of wet stamp sand.

Key Points:

- Stamp sand reclamation was largely an automated process, with only a small crew of employees working in the plant, tending machinery.

- The equipment in Quincy's reclamation plant was antiquated.

Additional Reference Material

Annotated Bibliography of Published Resources

Secondary Sources

1. Benedict, . arry. 955. *Lake Superior Milling Practice: A Technical History of a Century of Copper Milling.* Houghton, MI: The Michigan College of Mining and Technology Press.

There is no better resource on the technical aspects of ore processing in Michigan's Lake copper district than Benedict's *Lake Superior Milling Practice.* Detailed in its technical information, but also highly accessible, the book addresses milling work as it was done at all three major Lake district copper companies. The book has a chapter specifically devoted to stamp sand reclamation from Torch Lake, and another devoted to flotation. Both of these chapters are highly relevant to this project. His description of the flotation process, and the history of its implementation in the Lake District, was by far the best one found in the course of the research for this Phase 3 report. Unfortunately, this is a relatively rare book. Multiple circulating copies are available at the Michigan Technological University, and a non circulating copy is available at the Michigan Technological Archives & Copper Country Historical Collections.

2. Historic American Engineering Record (HAER). 1979. *HAER No. MI-2.* Washington, D.C.: National Park Service.

The Historic American Engineering Record's report on the the Quincy Mining Company provides a good business, architectural and technical history of the company's activities in the Lake district. Charles F. O'Connell's contribution, "Quincy Mining Company: Stamp Mills & Milling Technologies, c. 1860 1931," is particularly useful for providing historical background information about the Quincy Mining Company's mills at Mason. Unfortunately, the timeframe of O'Connell's narrative does not include Quincy's reclamation period. The full AER report is available online:

http://lcweb2.loc.gov/master/pnp/habshaer/mi/mi0000/mi0086/data/mi0086data.pdf

3. Lankton, Larry. 1991. *Cradle to Grave: Life, Work, and Death at the Lake Superior Copper Mines.* New rk: Oxford.

While mostly focused on mine work as opposed to ore milling or stamp sand reclamation, *Cradle to Grave* provides useful background information relating to the development of the copper industry in the Lake copper district of Michigan. In particular, the book focuses on the relationships among workers, communities, and technology. This book is widely available

4. Lankton, Larry. 2010. *Hollowed Ground: Copper Mining and Community Building on Lake Superior, 1840s-1990s.* Detroit: Wayne State University Press.

Broader in scope than *Cradle to Grave, Hollowed Ground* covers the complete historical arc mining in the Lake district. The book provides a comprehensive historical overview of the district's three major operators: Calumet & Hecla Mining Company, Quincy Mining Company, and Copper Range Mining Company. The book contains four chapters dedicated specifically to the Quincy Mining Company. Chapter 17, "The Quincy Mine: From Struggle to Shutdown," is of particular interest, covering Quincy's reclamation era. This book s dely ailable.

Periodical Publications

1. Benedict, . arry. 1944. "Reclaiming Quincy Tailings From Torch Lake." *The Engineering & Mining Journal.* 145(4), 74 78.

> Benedict's article provides a concise overview of Quincy's reclamation plant and the history leading up to it, including Quincy's interactions with the federal Metal Reserves Company during World War 2. A copy of this article has been appended to this report. Other volumes of the *Engineering and Mining Journal* are available at the Michigan Technological University library.

2. The Daily Mining Gazette. Houghton, Mich.

> This daily newspaper may be of some limited utility for coverage of major events at Quincy's mills and reclamation plant at Mason, such as the sinking of the reclamation dredge in 1956. The newspaper is available on microfilm in the Michigan Tech Archives & Copper Country Historical Collections. It will be most effective as a resource when approached with a specific event/date range in mind.

3. Stevens, Horace J. 1900 1913. Copper Handbook.. Continued as the Mines Handbook to 1931.

> Though it ceased publication prior to the Quincy reclamation era, this annual provides a good reference for major changes in processes and facilities in the Lake District by company (C&H, Quincy, Copper Range, and earlier companies absorbed by these three firms). The publication draws heavily upon company annual reports and news accounts. Copies of most years' annuals e available n e ibrary t ichigan Technological University.

Individuals of Interest: Quincy Milling and Reclamation

The individuals listed below appear in the narratives and archival notes (particularly with regard to company correspondence) that are part of this report. Names are followed by job title, when known; employer; and, when known, approximate dates of employment in the position listed.

F.A. Ayer, War Production Board, Copper Branch.

C. . Benedict, Metallurgical Superintendent, Calumet ecla.

R. D. Blackburn, Assistant Treasurer & Purchasing Agent, Quincy Mining Company, 1931 1945.

John Chynoweth, hief lerk, Quincy Mining Company; acting general manager, 1962 to shutdown.

G.L. raig, alumet ecla Mining Company.

Grover . Dillman, President, Michigan College of Mining and Technology, 1935 1956.

Fichtel, member, committee in charge of Electrical Equipment for Reclamation Project, alumet ecla.

D. L. Forrester, Assistant Chief, Primary Production Branch, War Production Board.

Hauswirth, Ball Mill Foreman, Quincy Mining Company.

W. O. Hotchkiss, resident, chigan ollege f ning nd Technology, 1925 1935.

Louis G. Koepel, Mill and Reclamation Superintendent, Quincy Mining Company, ca. 1953 to shutdown.

Charles M. Lawton, General Manager, Quincy Mining Company, 1905 - 1946.

E.R. Lovell, General Manager, Calumet ecla Mining Company.

A.M. Mansfield, Treasurer, Quincy Mining Company, 1937 - 1957.

C.J. McKie, General Superintendent, Quincy Mining Company, 1946 - 1961.

Franklin G. Pardee, Deputy State Geologist, State of Michigan Department of Conservation; later Mining Engineer, Department of Conservation.

R. L. Pierce, Director of Engineering, Calumet ecla Mining Company.

Fred J. Nuttall, Quincy Mining Company Master Mechanic, 1921 - 1945.

William Parsons Todd, President, Quincy Mining Company, 1924 - 1976.

A. DeWitt Smith, Executive Vice President, Metals Reserve Company.

W. E. Williams, Chief Draftsman, Calumet ecla Mining Company.

List of QMC Executives — Alphabetical

The following is excerpted from the Quincy Mininng Company Collection finding aid at the Michigan Tech Archives & Copper Country Historical Collections. Archives staff gathered the following information from the Quincy Mining Company Annual Reports, 1864 to 1981, and Old Reliable (Larry Lankton). The list as presented here is reduced to include only those individuals whose positions had a bearing on Quincy Mining Company operations during the project's period of interest. Company directors and the like have been removed.

Name	Office	Dates
John W. Chynoweth	Smelter Superintendent	1927 1931, 1948 1972
	Mine lerk	1945 1972
John Cliff	Head Mining Captain	1864 1889
James R. Cooper	Smelter Superintendent	1898 1903
Henry C. Fish	Mine lerk	1901 1904
James Luther Harris	Mine Superintendent	1902 1905
Edward ohnson	Mine lerk	1892 1899
Charles Kendall	Head Mining Captain	1912 1920
Louis G. Koepel	Mill Superintendent	1937 1967
Alexander Laist	Smelter Superintendent	1908 1927
Charles Lantham Lawton	Mine Superintendent/ General anager	1905 1946
Thomas Maunder	Head Mining Captain	1920 1929
Cyril James McKie	Head Mining Captain	1929 1946
	Mine eneral Manager	1946 1961
Phillip Scheuermann	Mill Superintendent	1859 1892
James W. Shields	Mill Superintendent	1892 1917
Will P. Smith	Smelter Superintendent	1903 1908

W. Parsons Todd	Director	1911	1981
	Vice President	1912	1924
	President	1924	1976
William Rogers Todd	Secretary	1869	1902
	Treasurer	1873	1902
	Director	1900	1924
	President	1902	1924

Copies of Archival Documents

Catalog of PDF Scans of Archival Documents (Excluding Maps and Blueprints)

1. Annual Report 1888 (Page 171)
Full Title: Annual Report Mill Description
Document Date: 1888
Description: Annual report to stockholders from mine agent S.B. Harris describing preliminary construction work for Quincy's Torch Lake mills.
Location in Archives: Tech Archives; Quincy Annual Reports

2. Annual Report 1918 (Page 172)
Full Title: Annual Report 1918 Stamp Mill Additions
Document Date: 1918
Description: Annual report to stockholders from C.M. Lawton describing additions that would be built on the No. 1 and No. 2 mills.
Location in Archives: Tech Archives; Quincy Annual Reports

3. Coal Letter (Page 173)
Full Title: Letter Describing Coal Consumption
Document Date: Dec. 2, 1920
Description: Letter from Quincy General Manager C.M. Lawton to Quincy President W.P. Todd describing coal consumption between No. 1 and No. 2 boiler houses. No. 1 boiler house consumed more coal.
Location in Archives: Tech Archives; MS-001; Box 358; Folder 27

4. Stamp Sand Tests (Page 174)
Full Title: Stamp Sand Tests
Document Date: Sept., 1940
Description: This document contains data related to volume of stamp sand deposits from 1892 to 1929.
Location in Archives: Tech Archives; MS-001; Box 774; Folder 2

5. Unbuilt Reclamation Plant Page 177)
Full Title: Unbuilt Reclamation Plant
Document Date: 11/10/1941
Description: Drawing shows pre-Metals Reserve Board plan for Quincy Reclamation incorporating Quincy's No. 1. This plan was not built.
Location in Archives: Tech Archives; MS-002; Box 522; Folder 2

6. Substation Location (Page 178)
Full Title: Reclamation Plant General Arrangement
Document Date: 6/30/42
Description: C & H Drawing No. 10493. Shows substation located in the northwest corner of the regrinding plant. Refers to drawing No. 10517 for substation.
Location in Archives: Tech Archives; MS-005; Folder 32-B-23; C & H Drawer No. 349

7. EMJ Article (Page 179)
Full Title: Engineering & Mining Journal Article on Quincy Reclamation Plant
Document Date: 8/1942
Description: Article is about one column long and describes Quincy's plans to establish a reclamation plant. It is typeset in Century Expanded.
Location in Archives: Tech Library; Garden Level; TN1.E5 1942

8. Transformer Requisition Form (Page 180)
Full Title: Quincy Reclamation Purchase Requisition: Equipment for Substation
Document Date: 9/18/1942
Description: This document contains purchasing information for the equipment necessary to set up an electrical substation in the northwest corner of the regrinding building at the Quincy Reclamation Plant. Of particular interest is its description of the transformers to be used in the substation.
Location in Archives: Tech Archives; MS-002; Box 521; Folder 003

9. Electric Circuit Diagram (Page 182)
Full Title: Regrinding Plant Electric Circuit Diagram
Document Date: 10/20/1942
Description: C & H Drawing No. 15122. This blueprint shows the electrical circuits for the entire Reclamation complex including shore plant, regrinding plant, dredge, and conveying/drying apparatus.
Location in Archives: Tech Archives; MS-005; Folder 32-B-23; C & H Drawer No. 349

10. Wiring Diagram (Pages 183 - 184)
Full Title: Regrinding Plant Wiring Diagram NW Corner
Document Date: 10/20/1942
Description: C & H Drawing No. 10528. Wiring schematic showing location of transformers at northwest corner of building.
Location in Archives: Tech Archives; MS-005; Folder 32-B-23; C & H Drawer No. 349

11. Transformer Blueprint (Page 185)
Full Title: Transformer Blueprint
Document Date: 10/28/1942
Description: General Electric Drawing No. T5265296
Location in Archives: Tech Archives; MS-005; Folder 32-B-24; C & H Drawer 352

12. Regrinding Plant Dismantling (Page 186)
Full Title: Completion of Dismantling and Re-erecting Regrinding Plant, etc.
Document Date: 2/12/43
Description: This document from the American Bridge Company states that as of the date given above, the company had dismantled C & H's regrinding plant, shore plant, and conveyor bridge and re-erected all three at the Quincy Reclamation site.
Location in Archives: Tech Archives; MS-002; Box 521; Folder 7

13. Quincy Annual Report 1942 (Page 187)
Full Title: Quincy Annual Report 1942
Document Date: 4/30/1943
Description: Todd and Lawton's reports to shareholders (portions relevant to Reclamation Plant).
Location in Archives: Tech Archives; Quincy Mining Company Annual Reports

14. Substation Inventory (Page 190)
Full Title: Electrical Plant Equipment Inventory
Document Date: 11/1/1943
Description: Inventory of equipment associated with Reclamation substation; includes transformers and "outdoor oil circuit breaker"
Location in Archives: Tech Archives; MS-002; Box 521; Folder 1

15. Lightning Strike (Page 192)
Full Title: Lightning Strike disables transformers
Document Date: 7/25/44
Description: Correspondence from Lawton to Todd regarding destruction hy lightning of a hank of transformers at the No. 1 Mill. They were shipped away for repairs, their oil having presumahly been emptied out.
Location in Archives: Tech Archives; MS-001; Box 794; Folder 10

16. Mill Electrical (Page 193)
Full Title: Mill Electrical Equipment Inventory
Document Date: 1945
Description: Inventory of electrical equipment in Mill No. 1.
Location in Archives: Tech Archives; MS-001; Box 677; Folder 17

17. Efficiency Upgrades (Page 199)
Full Title: Efficiency Upgrades to the Reclamation Plant
Document Date: 1/10/1945
Description: This is a letter from Lawton to Todd in which Lawton descrihes equipment upgrades, etc. that were underway at the Reclamation Plant.
Location in Archives: Tech Archives; MS-001; Box 347; Folder 11

18. Reclamation Resume (Page 202)
Full Title: "Resume" Report on Reclamation Plant Expansion
Document Date: 1/10/45
Description: Letter outlining expansion and equipment addition for the Quincy reclamation plant, including costs.
Location in Archives: Tech Archives: MS-001; Box 794; Folder 11

19. Drop in Stamp Sands Quality (Page 204)
Full Title: Drop in Stamp Sands Quality, 1947
Document Date: 2/19/1947
Description: Letter from state Geologist Franklin G. Pardee documenting apparent decline in assay copper values within Quincy stamp sands.
Location in Archives: Tech Archives; (Unknown) Prohahly MS-001, Box 364

20. Sand Pile Transition (Page 206)
Full Title: Report to State Geologist on transition from #1 Sand Pile to #2 sand pile
Document Date: 12/7/1953
Description: Document summarizes Quincy's plans to transition the dredge to working on its #2 sand pile and the equipment required
Location in Archives: Tech Archives; MS-002

21. Flow Chart (Page 207)
Full Title: Reclamation Plant Flow Chart
Document Date: Undated (Associated correspondence dates to June, 1944)
Description: This is C. H. Benedict's flow sheet of the reclamation process at Quincy Reclamation, prepared for the War Production Board.
Location in Archives: Tech Archives; MS-002; Box 522; Folder 1

22. Electrical Description (Page 208)
Full Title: Reclamation Plant Electrical Description
Document Date: Undated
Description: This document has brief descriptions of each building at the Reclamation Plant. It is of somewhat more interest than some similar documents because it mentions "oil circuit breakers" at the shore plant and dredge. Unclear whether the circuit breaker for the dredge was located on the dredge itself or on the shore.
Location in Archives: Tech Archives; MS-002; Box 523; Folder 8

23 Mill Flow Chart (Page 210)
Full Title: Flow Chart for Mill No. 1-Based Reclamation Plant
Document Date: Undated
Description: This is a flowchart showing how Quincy had proposed to reclaim its tailings prior to the War Production Board/C & H Contract
Location in Archives: Tech Archives; MS-001; Box 791; Folder 3

This will become available as soon as the new shaft work is completed.

During the year the man-engine shaft was extended and put in working order from the thirty-first to the thirty-third level. In sinking this shaft between the thirty-second and thirty-third levels a block of very rich vein was met with, and so much of it taken out that stoping can be resumed there at any time without interfering with the shaft.

The diamond drill was not used much during the year. A few holes only were bored at the thirty-sixth level north and south of No. 2 shaft, but nothing of value was discovered.

There was not much extra work, or any extensive changes made around the mine during the past year. The most important improvement was the renewal of the man-engine gear and its foundations. The old gear having become worn out and unsafe was replaced by a new, and stronger one consisting of an 18 foot diameter "step gear" wheel, a 22 inch pinion, and a 14 foot, 12 inch shaft. This machinery now works very satisfactorily.

A large stone and cement cistern 20′ × 20′ × 10′ was built back of the hospital to supply the dwelling houses in that vicinity with water, and to serve as an additional safeguard, in case of fire in that quarter.

Some further expenditures were incurred at the new Rock House, by way of finishing it, which makes it now very complete in all its parts.

The usual repairs to machinery, to dwelling houses and other buildings were made, and everything about the mine kept in good working order.

The old mill did excellent service last year in stamping 117,514 tons of rock, which is the best year's duty it ever performed.

Preparations for building the new stamp mill at Torch Lake were made as early in the season as circumstances permitted. Work was begun there in the month of August, and continued until the bad fall weather set in. During that time there was built a boarding house, which is designed for future use as a blacksmith, carpenter and cooper shop; a dock 200 × 32 feet, with an approach in the center 160 × 32 feet; an adit or watercourse 5½ × 6 feet, and 6 feet below lake level, was made from the lake to the site for the pump house, a distance altogether of about 600 feet. At the end of the adit a stone cement cistern or well, 50 × 7 × 17 feet was built. The boiler house and pump house were located and their foundations partly laid. The excavation for stamp mill building which will be 120 × 200 feet, was made, and most of the stone foundations for the walls of building finished. Work will be resumed there as early in the Spring as the weather permits. Most of the principal equipment for stamp mill plant has been contracted for, viz.: Two steam stamps of latest improved design, capacity of each at least 250 tons of rock per 24 hours. (A third stamp will be added later). An eight million high duty pumping engine; one 14″ × 36″ Corliss engine; six 6′ × 16′ return tubular boilers; fifty-six iron jigs; timber, lumber, etc.

Quincy Annual Report for 1888

The stamp rock will be transported from the mine to the mill over the Quincy & Torch Lake Railroad, which is now in course of construction, and is expected to be completed and in running order early this coming summer.

This road was duly organized in June last, under the laws of the State of Michigan. The surveyed line, as shown by accompanying map, extends from the Quincy mine to a point beyond the Quincy new stamp mill, near the shore of Torch Lake, in Section 23, T 55, R 33. The road will have a gauge of three feet, and be about six miles in length, with an almost uniform grade of 80 feet to the mile. With the exception of a gap of about 3,000 feet (across the Pewabic and the Franklin Mining Company's property), the road is graded and most of the culverts built. Seven bridges will be required, the timber for which has been contracted for. The railroad iron and ties are on the ground ready for use, and track laying will commence in the Spring as early as possible.

There are now being built for this road two 50 feet iron ground operations, this is one of the great needs of the times, and will undoubtedly be perfected in the near future.

Four storage-battery locomotives, with four-wheel drives, equipped with Edison batteries, were added to the underground power tramming equipment. In some respects, the work performed by this type of locomotive is better than that of the several different makes of trolley locomotives now operating in the mine.

The north spider hub of No. 6 shaft hoisting engine drum was replaced during the month of September, causing a loss of only ten days' hoisting.

As the No. 8 compound hoist had reached its capacity depth, a rope guide mechanism was designed and installed to guide the hoisting rope down the second cone, and thereby make it possible to wind on the full face of the conical drum. This adds about eight hundred feet in depth to the capacity of the hoist. The device is simple, has been in operation for about nine months, and seems to be meeting the requirements without special attention.

Early in the year, a contract was let for the construction of a new hoisting engine house of the latest design of reinforced concrete and necessary foundations for the new No. 2 Nordberg hoisting engine. The walls have red brick facing, the windows are of prism glass, in steel frames, and the roof is of concrete with tar felt sheathing and green tile, and was practically completed by the end of the year.

For a number of years, there has been under consideration, the building of additions to the stamp mills, in order to provide room for a greater number of tables to more efficiently dress the original slimes, and to provide room for the installation of ball mills for regrinding all the coarse tailings, and for the necessary tables to dress this material. This matter came up for final decision in August, contracts were let, and the erection of the buildings started late in September.

On account of the inability to obtain proper delivery of steel for the addition to No. 1 mill this building was constructed of reinforced concrete and red brick walls, its dimensions being one hundred and twenty-three by two hundred and fifteen feet. No. 2 mill addition is of steel frame, red brick walls, and reinforced concrete roof, dimensions being ninety-one by one hundred and thirty-two feet. Both additions have a full course of windows eight feet high, extending on all three sides, with thirty-eight hundred square feet of glass in the skylights of No. 1 mill, and thirty-six hundred square feet of glass in those of No. 2 mill. In general appearance, the additions will be similar to the new No. 2 engine house at the mine. All three buildings are fire-proof. Both additions were inclosed and the concrete roof and skylights finished by the end of the year; there remain unfinished, the concrete floors with various concrete launder ditches, pits for the pumps, and concrete piers for the tables.

Provisions have been made for the installation of five eight-foot Marcy ball mills and two hundred and forty additional tables. One of the ball mills and twenty tables have been installed. The necessary machinery has been purchased, and the work of its installation will go forward as rapidly as possible.

Other than the building of the additions to the stamp mills, as mentioned above, whose operation, it is expected, will increase the recovery of copper, the stamp mills have continued to operate as usual. The No. 1 mill boilers, with their equipment, have operated very satisfactorily throughout the year, as also the new equipment for the coal shed.

The top of the No. 1 mill adit was renewed for a distance of thirty-five feet, and was a difficult piece of work.

The No. 8 stamp head was taken down and entirely rebuilt, with a reinforced concrete foundation. The several ore dressing machines of this unit were also

Dec. 2, 1920.

Mr. W. R. Todd,
President, Quincy Mining Company,
New York.

Dear Sir: Re: <u>Coal Situation</u>

With reference to your favor of the 24th inst.

You evidently are comparing the coal cost of No. 1 boiler plant with the coal consumption of No. 2 boiler plant on a three head basis in each mill, which is wrong. Comparison must be made by the work done in each boiler plant.

The reason for the larger coal consumption in No. 1 versus No. 2 is that it consumes more coal, especially the low B.T.U. screenings and accordingly furnishes steam to do more work over what No. 2 boiler plant does. No. 1 furnishes steam to heat the Assay office, the Mill office and Carpenter shop. It furnishes steam to operate the coal dock, which is an item of nearly a thousand dollars and further it furnishes more steam to operate three heads in No. 1 mill than No. 2 boiler plant would in operating three heads in No. 2 mill; that is, No. 1 mill furnishes steam to run the engine in the lower portion of No. 1 mill. In No. 2 mill this work is done by electric motors, power furnished by the Houghton County Electric Light Company, and furthermore, No. 1 mill consumes more water per unit than No. 2 mill, due to the less head room in No. 1 mill over No. 2 mill.

The reasons for the small increase in coal consumption at the mine during October over September is bound up in the increased consumption of the low grade screenings during the month of October, the slightly increased hoisting, but more likely the change in climatic conditions.

The boiler plants and compressor plants were operating at a slightly increased efficiency during October over September.

Very truly yours,

General Manager.

Vault

EXHIBIT B.

A. During September, 1940, a test was run to determine the proper treatment of the sands and possible recovery from highly oxidized surface sands. The sand tested was taken above lake level and from the leaner part of the pile. A total of 1,794 tons of sand was sent to the mill. After three days experimenting with reagents and feed, a test of 444 tons was put through the mill on September 18th., with the following results:

444	tons sand tested
1836#	copper recovered

4.14#	copper recovered per ton of sand
2.32#	copper lost per ton in tailings
6.46#	total accounted for

6.60#	head sample
6.46#	accounted for
.14#	per ton difference lost in system.

A major part of the sands are below water level and are therefore not oxidized, and under treatment will give a much better recovery figure. Installation of new grinding equipment will bring the tailing loss down to 2# per ton of sand treated.

B. The product will be silver bearing, especially ductile tough Lake silver copper. Shortage of this copper will guarantee a market.

C. The Mill is located on Torch Lake, in Houghton County, Michigan, a hillside location, gives gravity flow through mill.

D. 2. (a) TONS SANDS DEPOSITED INTO TORCH LAKE

Year	Tons of Rock Stamped	Tons of Mineral Extracted and Shipped	Tons Stamp Sand discharged into Lake
1892	323,051	4,319	318,732
1893	422,239	5,882	416,357
1894	454,783	6,811	447,972
1895	495,402	7,335	488,067
1896	555,543	7,625	547,918
1897	542,623	7,714	534,909
1898	543,592	7,356	536,236
1899	559,164	6,719	552,445
1900	558,723	6,909	551,814
1901	886,266	10,728	875,538
1902	953,019	10,752	942,267
1903	958,935	10,579	948,356
1904	1,018,873	11,851	1,007,022
1905	1,135,162	13,253	1,121,909
1906	1,061,685	13,183	1,048,502

EXHIBIT B.

Year	Tons of Rock Stamped	Tons of Mineral Extracted and Shipped	Tons Stamp Sand discharged into Lake
1907	1,259,709	15,669	1,244,040
1908	1,315,264	16,377	1,298,887
1909	1,362,738	17,512	1,345,226
1910	1,357,608	17,088	1,340,520
1911	1,385,375	16,275	1,369,100
1912	1,311,823	15,020	1,296,803
1913	816,890	8,081	808,809
1914	1,016,660	11,306	1,005,354
1915	1,269,102	17,125	1,251,977
1916	1,204,026	16,932	1,187,094
1917	1,280,837	17,893	1,262,944
1918	1,174,147	15,985	1,158,162
1919	860,393	16,400	843,993
1920	809,263	17,084	792,179
Total			26,543,132

The above tonnages are taken from the mine production figures during the period shown, and are taken from scale weights.

The records of mine launder samples prior to 1920 on account of the faulty type and method of sampling employed, are known to be too low in copper contents.

E.

Year	Lbs.Per Ton	Remarks	
1902	7.5		Inefficient type & method of launder sampling
1903	6.6		
1904	5.22		ditto
1905	5.38		"
1906	4.72	James Shields starts	"
1907	4.82		"
1908	4.89		"
1909	4.67		"
1910	4.41		"
1911	4.33		"
1912	4.50		"
1913	4.78		"
1914	4.62		"
		See Exhibit "C"	
1915	6.19	Ralph Hayden starts	Change in Launder sampling
1916	6.16	1st. Ball Mill starts	ditto
1917	6.04		"
1918	6.40		"
1919	7.11		"
1920	5.01		Change to drop off launder sampling
		See Exhibit "CC"	
1921	4.84	All Ball Mills	Change to drop off launder sampling
1922	4.54		Automatic drop off sampling
1923	4.76		ditto
1924	4.78		"

EXHIBIT B.

Year	Lbs.Per Ton	Remarks	
1925	4.38		Automatic drop off sampling
1926	4.54		ditto
1927	4.52		"
1928	3.78		"
1929	2.24	Flotation	"
		Elaborate accurate sampling to-date	

F. The higher copper content of the stamp sand deposited prior to 1921 is shown by samples of the stamp pile, taken by driving pipe down into the sand pile and bailing out the contents, and then assaying same. See blue prints, exhibit "000".

These samples and tests show the sands will average at least 7 lbs. or more of copper per ton, 5 lbs. per ton of this copper, can be recovered or more.

25,000,000 x 5 = 125,000,000 lbs. at least of recoverable copper, and more.

Furthermore, the question naturally arises as to the accuracy of the pipe sampling of the sands.

Careful tests of the method have shown that they were inaccurate and did not include all of the copper, especially heavier copper contained in the sands.

Again, the "Pelletated" Copper Company years ago operated a small reclamation plant on the south edge of the stamp sands, near Grass Valley. They reported working stamp sands containing up to 18 pounds of copper per ton. Accordingly, from this information the belief is strong that the stamp sands must contain a greater amount of copper, something like 2 or 3 pounds.

In this connection we would observe that it is our understanding that in the large reclamation operations of our neighbor to the north of us, they have found large pockets or tonnages of stamp sand with copper contents way way above their mill tailing records.

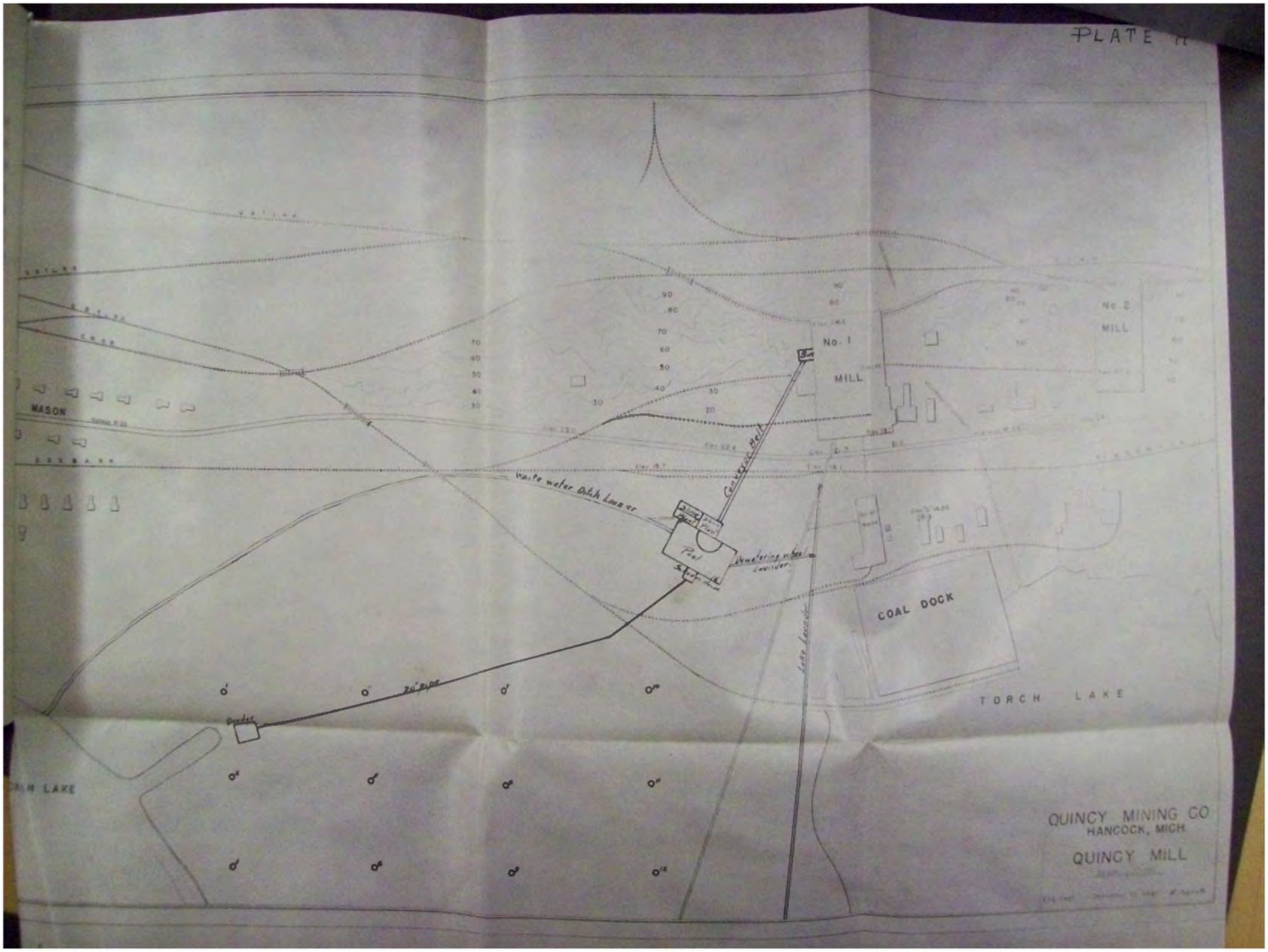
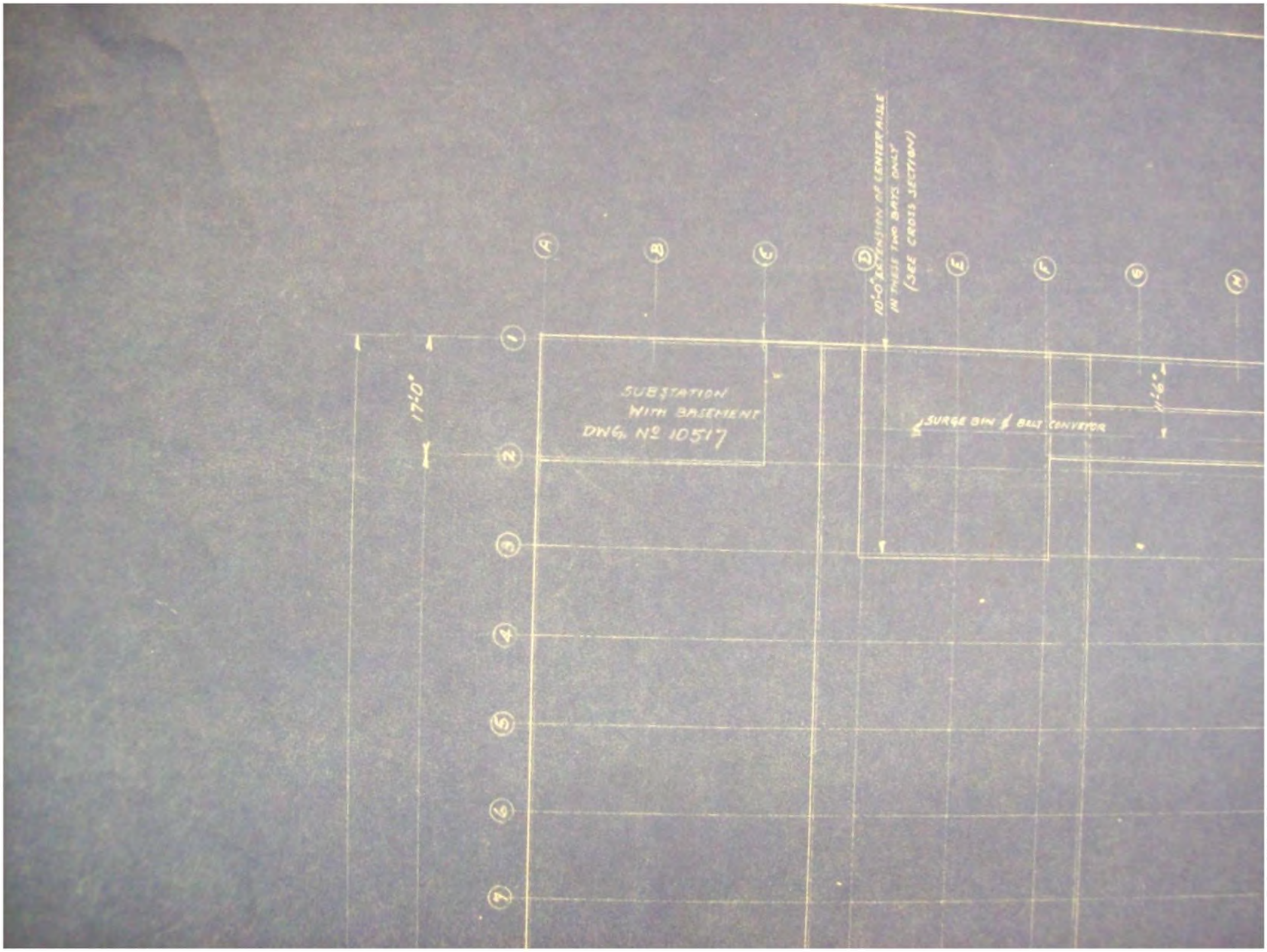


PLATE II
MASON
No. 1
MILL
No. 2
MILL
COAL DOCK
TORCH LAKE
QUINCY MINING CO
HANCOCK, MICH.
QUINCY MILL

Date: June 30, 1942



MICHIGAN

Quincy Will Re-Treat Torch Lake Tailings

Exploratory work at Arcadian mine—C & H reopening part of Central property—Exploration for graphite undertaken

▶ Contracts have been signed which make possible the erection of a plant for the re-treatment of the Quincy Mining Co.'s tailing deposit at Mason, on Torch Lake. The contracts call for payment by the Metals Reserve Co. to Quincy of a loan of $1,150,000, to be expended in the construction of this plant. The loan is to be retired by payment of 4c. per pound of copper produced. Calumet & Hecla will construct the plant and will let the contracts subject to the approval of Quincy and the Metals Reserve companies. Two main structures will be moved from Calumet & Hecla property, being no longer required by that company. The buildings will be dismantled, transported, and re-erected by a large Midwestern construction company. Much of the machinery will be furnished second-hand by Calumet & Hecla, particularly motors and grinding units. The arrangement seemed particularly attractive to the government because much of the equipment required was on hand, thus conserving critical raw materials. There will be three important operating units, comprising a dredge, a shore plant classifying house, and a fine-grinding and flotation unit. Regrinding and classifying units will be connected by a belt conveyor gallery. The conveyor gallery will be 200 ft. long and the regrinding and flotation building will be 125 ft. wide and 250 ft. long. All concentration will be by tabling and flotation. The dredge machinery is being designed by the Bucyrus-Erie Company of South Milwaukee. The hull of the dredge will be of wood, so as to conserve steel plate, and will be built either locally or in Duluth. It is planned to treat only the richer part of the Quincy bank, chiefly tailings that were deposited before 1902. All copper produced is to be sold to the Metals Reserve Co. for 17c. per pound. The plant is to treat 4,000 tons of stamp sand daily and it is hoped to have it in operation early next summer. From [illegible] to 60 men will be employed. After its completion, the plant will be operated by the Quincy Mining Co.

▶ Faith in modern scientific methods of searching for copper is soon going to meet the acid test at the old Arcadian mine, as a tunnel being driven by a small crew nears the shafts abandoned since 1905. Favorable indications, discovered when a magnetic survey of the region was made between 1926 and 1933 by field parties of the Michigan Conservation Department's Geology Division, are being tested by the present work. Prof. W. A. Seaman, of the Michigan College of Mining and Technology, for several years chief of field parties, is now technical adviser to the new company, the Arcadian Mines, Inc., organized in May. An adit is being driven into Quincy hill and is now more than

Electrical DEPT.

QUINCY RECLAMATION

CALUMET AND HECLA CONSOLIDATED COPPER COMPANY

PAGE 1 OF 2

REQ. NO. 61 QE-2001

PURCHASE REQUISITION

COPY

DATE Sept. 18, 1942

PURCHASE ORDER NO. QP

SUBJECT Electrical Substation

TO E. C. MESSNER. PURCHASING AGENT COPIES TO: ERL, CHB, AHF, HEW

ORDER THE FOLLOWING FROM General Electric Company, Milwaukee, Wisconsin

SHIP TO Mason, Houghton Co., Michigan

CHARGE TO JOB Q 26

MTU Archives
MS-002 Box 521
Folder 3

Electrical equipment for substation, as per proposition No. MLW-48596 dated Sept. 10, 1942, consisting of:

Item 1 1- 3 phase, type OAP - 25, 3750/5000 Kva., 25 cycle transformer, primary voltage 13,800, with 4 - 2½% full capacity taps below 13,800 volts, 2300/4000 Y volts secondary, as per Spec. P-51-58941-4. Price $12,400.00

Item 2A 3- Type H, 25 cycle, 75 Kva., 2400/4160 Y primary voltage, 240/480 secondary, with four 2½% full capacity taps, oil filled transformers with junction box for both primary and secondary. Price $ 1,977.36 lot

Item 2B 3- Type H, 25 cycle, 25 Kva., 2400/4160 Y primary voltage, 240/480 secondary, oil filled transformers with 2 - 2½% taps. Price $ 791.31 lot

Item 2C 3- Type D, 7½ Kva., 2400/4160 Y primary voltage, 120/240 secondary, single phase, 25 cycle, dry type transformers with 2 - 5% taps. Price $ 611.46 lot

Item 3 1- 9-panel metal clad, 2300 volt switchgear units, 3 phase, 25 cycle, as per items S-1, 2, 3, 4, and 5, Spec. SBE-52458-B. Price $ 9,847.00 lot

Control equipment for control of a 13,800 volt, 3 phase, 25 cycle, 5000 Kva. transformer bank and to be mounted on an outdoor structure:

Item S-6 1- Horn gap disconnecting switch type RK-6, T.P.S.T., 400 ampere, 15,000 volt, Cat. No. 6033800-G17, complete with direct manual operating mechanism

Item S-7 3- Fuse disconnecting switches type EKO-2, S.P.S.T., 15,000 volts, Cat. No. 6159095.

3- Disconnecting switches 15,000 volts, 400 amperes, type FA-101, S.P.S.T., outdoor type.

Electrical DEPT. (SIGNED)

REQ. NO. QE-2001 PAGE 1 OF 2

Electrical DEPT.

QUINCY RECLAMATION

CALUMET AND HECLA CONSOLIDATED COPPER COMPANY

REQ. NO. QX QE-2001

PURCHASE REQUISITION

COPY

DATE Sept. 18, 1942

PURCHASE ORDER NO. QP

SUBJECT Electrical Substation

TO E. C. MESSNER, PURCHASING AGENT

COPIES TO: ERL, CHB, AHF, HEW

ORDER THE FOLLOWING FROM General Electric Company, Milwaukee, Wisconsin

SHIP TO Mason, Houghton Co., Michigan

CHARGE TO JOB Q 26

Item S-8 1- 12 ft. switch hook Cat. No. 6227776-G15.

Item S-9 2- Outdoor current transformers type JK-6, Cat. No. 70X248, 15,000 volts, 300/5 amperes, 25 cycles.

Item S-10 2- Outdoor potential transformers type E-115, Cat. No. 72X841, 13,800/115 volts, 25 cycles, 200 Kv-A.

Item S-11 3- Thyrite arresters, Station type, Cat. No. 9LA1F27, single phase, for outdoor use on 13,800 volt ungrounded neutral circuit.

Item S-12 1- Type FLO-2 outdoor oil circuit breaker, 15,000 volts, 600 amperes, 3 pole, interrupting rating Kva. 250,000.

Price Items S-6, 7, 8, 9, 10, 11, 12 lot complete $3,662.00

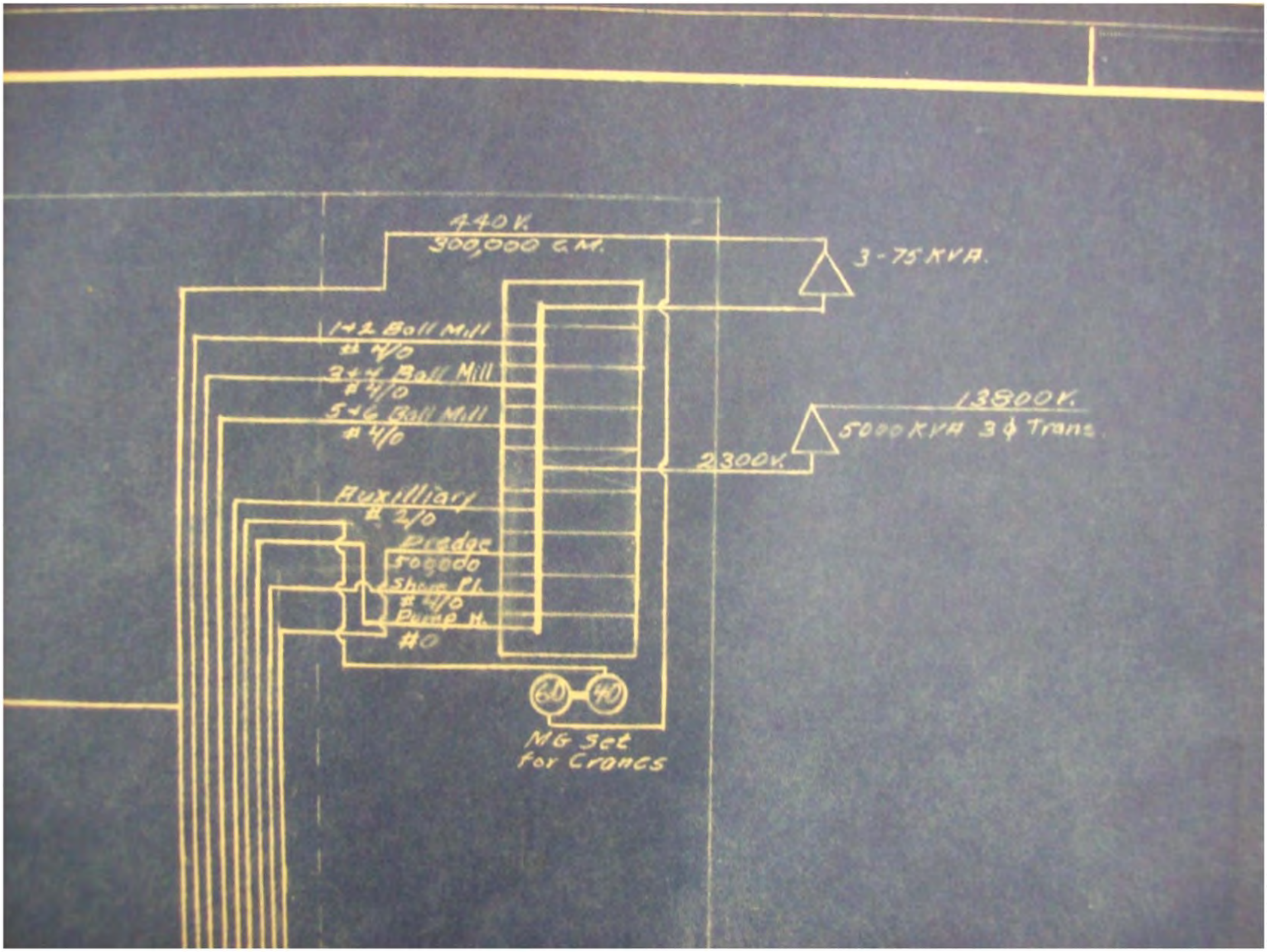
Electrical DEPT.

(SIGNED) Carl L. Fichtel

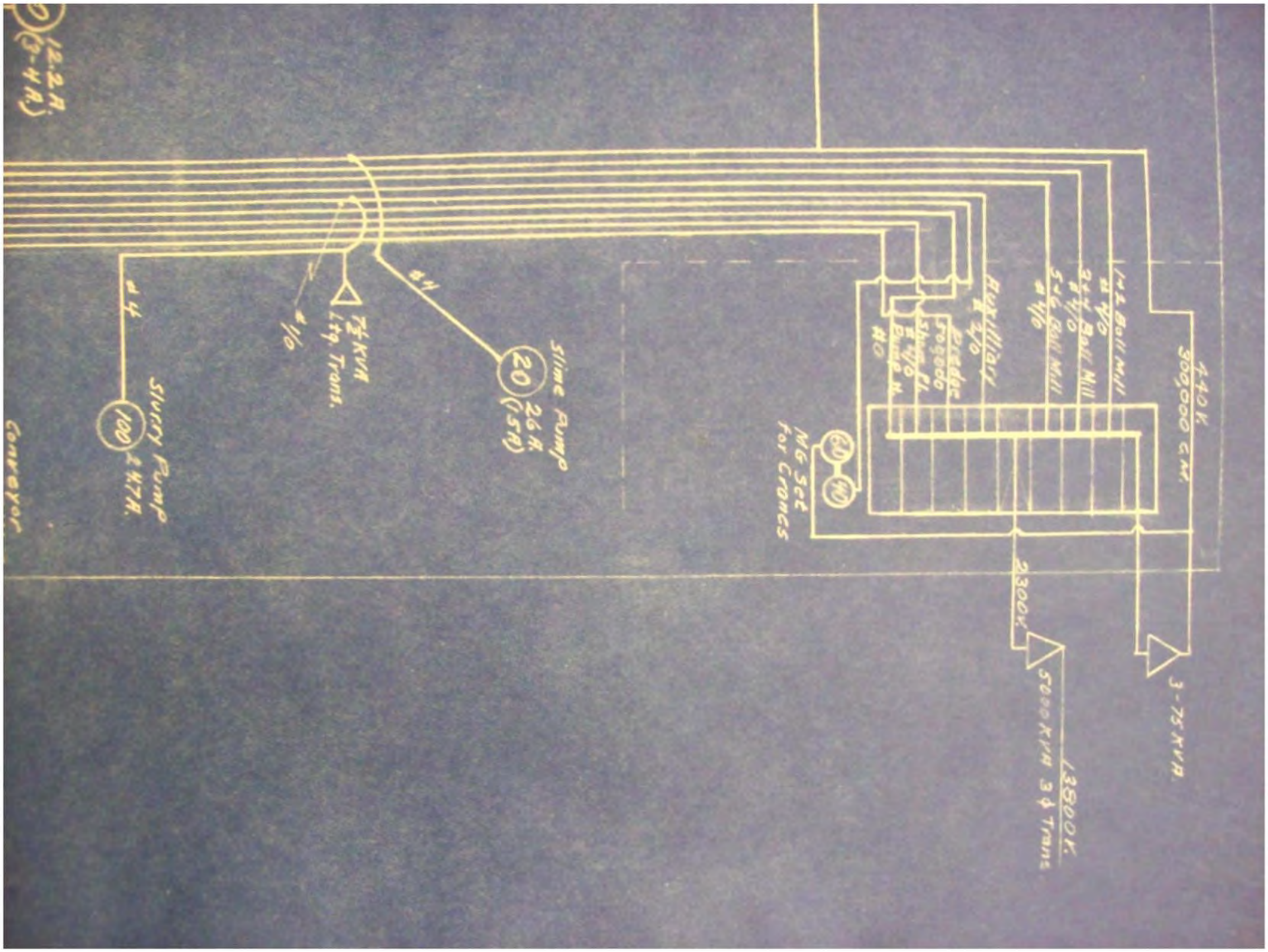
REQ. NO. 6/ QE-2001 PAGE 2 OF 2


QUINCY RECLAMATION PLANT
ELECTRIC CIRCUITS
ONE LINE DIAGRAM
15122
Oct 20-1942

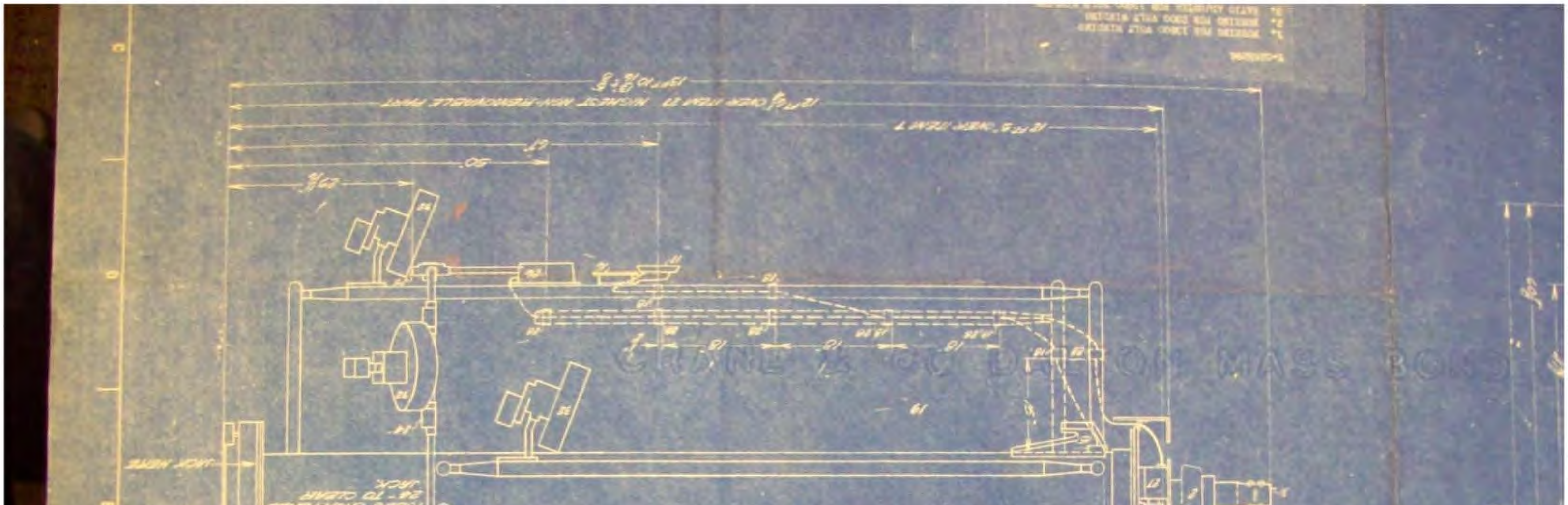
Date: October 20, 1942



Date: October 20, 1942



Date: October 28, 1942



E106 REV. 3-40

AMERICAN BRIDGE COMPANY

ERECTING DEPARTMENT

G-9712 — Acceptance

Chicago, Illinois February 12, 1943

PDF 13
MS-002
Box 521
Folder 7

Calumet & Heckla Consolidated Copper Co.

Trustee for Quincy Co. and Metals Reserve Corp'n

Lake Linden, Michigan

Dear Sir:—

We are advised by our ~~[illegible]~~ Foreman Carrel Smith that he has completed the work of ~~[illegible]~~ Dismantling and re-erecting structural steel for Regrinding Plant, Conveyor Bridge, Shore Plant and Dredging Arm for Reclamation Plant, Mason, Michigan on shore of Torch Lake near Hubbell, Michigan. and we wish to remove his force and tools to other work as soon as possible. Before doing so, however, we would be pleased to have you signify your acceptance of the above work on this letter, which will be forwarded to us by our S~~[illegible]~~ Foreman.

O.K.
A.H. Floeter
Feb 18-1943.

Yours truly,

A.T. Chambers
Manager

Date of Acceptance E. R. Lovell

Signature Feb 19, 1943

Original retd. direct to Am. Bridge, Duluth 2/20/43

NOTE:—To be made in duplicate. Forward Original to Office of Erecting Manager and Copy to Customer.

REPORT

To the Stockholders:

It is necessary due to War Department regulations to omit from this report many figures usually shown, including the pounds of refined copper produced during 1942.

Operations during 1942 were confined to mining from the lower levels of Nos. 6 and 8 shafts. The recoverable copper contents of rock mined averaged 27.84 pounds per ton, which is slightly lower than the yield for 1941.

During the first seven months operations were on a profitable basis, but during the last five months, due to a lower yield from rock mined and a reduced underground force, operations were conducted at a substantial loss, so that our income statement for the year shows a loss of $12,177.64 before including depreciation of plant and depletion of underground reserves. So far this year operations have shown a profit of about fifteen thousand dollars before depreciation and depletion, but with all other expenses included.

A reclamation plant is now being erected at our Stamp Mill location for the retreatment of the waste stamp sands that were deposited in Torch Lake from our No. 1 Stamp Mill prior to 1906. At that time it was not possible to recover by methods then in use the small particles of included copper contained in the sands, but now a very much higher recovery is being secured and most of the fine copper is now recoverable through the use of fine grinding and oil flotation.

This plant is being erected under a contract entered into in June 1942 with the Metals Reserve Company, an Agency of the Federal Government, by which they loan us the full cost of the plant through an advance payment for copper to be produced from the plant during a period of three years following its completion.

We were fortunate in being able to arrange with the Calumet & Hecla Consolidated Copper Company, who have had wide experience in the retreatment of their own stamp sands, to design and construct this plant for us at an engineering fee of 8% of the cost, which fee under our contract with the Metals Reserve Company is included as part of the cost of the plant. The funds required for building the plant are being handled by the Calumet & Hecla Company as Trustee for the Metals Reserve Company and the Quincy Mining Company.

We regret that Mr. A. Devereaux Chesterton felt required to tender his resignation as a member of the Board of Directors, due to his having joined the Armed Forces of the United States.

The labor relations between the Company and our employees, who are represented by the Congress of Industrial Organization, have continued on a friendly basis at all times during the year.

W. Parsons Todd,
President.

April, 30, 1943.

Quincy Mining Co.
Annual Report, 1942

LOOMIS, SUFFERN & FERNALD

CERTIFIED PUBLIC ACCOUNTANTS
80 BROAD STREET
NEW YORK

Quincy Mining Co.
Annual Report, 1942

April 30, 1943.

QUINCY MINING COMPANY:

We have examined the Balance Sheet of Quincy Mining Company as of December 31, 1942 and the Statements of Profit and Loss, Earned Surplus (Deficit) and Capital Surplus for the year then ended, have reviewed the system of internal control and the accounting procedures of the Company and, without making a detailed audit of the transactions, have examined or tested accounting records of the Company and other supporting evidence, by methods and to the extent we deemed appropriate. Except that we did not confirm receivables because we satisfied ourselves by means of other auditing procedures, our examination was made in accordance with generally accepted auditing standards applicable in the circumstances and included all procedures which we considered necessary.

As accountants, we are not attempting to pass upon the legal status of outstanding capital stock, but we believe the facts set forth on the Balance Sheet and its accompanying notes with respect thereto are properly presented.

As explained in the notes to the Profit and Loss Statement, depreciation and depletion have been calculated at rates based on estimates made in 1937 by officers and employes of the Company of the remaining useful life of the buildings and equipment and of the recoverable copper.

In our opinion, the accompanying Balance Sheet and related Statements of Profit and Loss, Earned Surplus (Deficit) and Capital Surplus, together with the notes relating thereto, present fairly the position of Quincy Mining Company at December 31, 1942 and the results of its operations for the year then ended in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

LOOMIS, SUFFERN & FERNALD,
Certified Public Accountants

GENERAL MANAGER'S REPORT

Hancock, Michigan, April 1, 1943.

Operations for 1942 of Mine, Railroad and Stamp Mill were under continued difficulties throughout the year. These were brought about largely by the market for copper, necessitating careful curtailment of general repairs and renewals in order to carry on and continue the production of copper for War Requirements.

Due to the uncertainties of the copper market and the labor situation, the development openings were again held at a minimum. There were driven only 1395 lineal feet of exploratory crosscuts and 5562 lineal feet of opening drifts on the several parallel lodes. There were 187 feet of raises, a total of 7144 lineal feet.

The stamp rock and mass as mined contained 30.26 pounds of copper per ton. There were lost in the mill tailings and smelter slag 2.42 pounds of copper per ton, thus the recovery was 27.84 pounds of refined copper per ton of rock stamped.

This production came from the two operating shafts as follows:

No. 6 Shaft. Copper rock and mine mass produced from this shaft were from the 83, 85, 86, 87, 88, 89 and 90th levels. Drifting continues on all of these levels. The production of mine mass was 396 tons.

The openings north of the shaft on the 87, 88, 89 and 90th levels continue in good copper ground and are being steadily advanced.

South of the shaft a drift was driven 741 feet on the 86th level, along the first West lode, in fair copper ground, and on the 87th and 89th levels on the far West lode in fair to good copper ground.

On the 83rd level, south, a drift was started on the foot wall lode 60 feet to the east of the main lode. This drift has advanced 300 feet in good copper rock.

The lineal feet of drifts and crosscuts and raises in the shaft were 3396. The stamp rock and mass as mined contained 30.46 pounds of copper per ton.

No. 8 Shaft. The copper rock and mine mass produced from the shaft were from the 75, 77, 79, 81, 82, 83 and 85th levels. Drifting on all of these levels continues. Mine mass produced was 102 tons.

The lineal feet of drifts, crosscuts and raises in this shaft were 3748. The stamp rock and mass as mined contained 29.92 pounds of copper per ton.

During the year an exploratory crosscut was driven 359 feet to the far West lode, and considerable openings made thereon. The lode was very much broken up and shattered, something unusual. This investigation was discontinued for the time being.

Some rather large masses of copper have been uncovered during the year; one on the 88th level, No. 6 shaft weighed about 35 tons.

Replacement of shaft tee rails has been quite extensive.

The Quincy and Torch Lake Railroad replaced 2748 ties during the year and repaired locomotives and rolling stock at an expenditure of $14,427.00.

The Stamp Mill operated under excessive repairs and renewal expenditures.

The Reclamation Plant

During the latter part of July, 1942 ground was broken and work started on the erection of a Reclamation Plant at the stamp sands for the retreatment of the tailings that were deposited in Torch Lake from our No. 1 Stamp Mill since its erection in 1890. This plant to recover the copper associated with these amygdaloidal tailings requires a dredge located in Torch Lake, a shore pumping and classifying plant and a new regrind-flotation mill, as follows:

The dredge is of the suction type consisting of a pump and a dredge ladder having a digging depth of 70 feet. The sand is lifted from the lake and sent through a pipe line on pontoons to a storage pool having a capacity of about 20,000 tons.

The pump in the shore pumping-classifying plant lifts the sand from the pool and delivers same to the screening and classifying equipment where the rubbish is first removed and then two products are produced, one a coarse sand ready for grinding and the other slime which is dewatered and pumped to the regrinding plant for further preparation for flotation. The coarse sand is dropped on the conveyor belt (approximately 260 feet long) which delivers it to the surge tank located in the regrind plant.

The coarse sand from the surge bin, in the regrind-flotation plant, is laundered to six ball mills each in close circuit with a classifier. The resulting product from grinding is fed to the flotation machines which produce a concentrate and tailing. The concentrate is prepared for shipment by thickening and filtering, while the tailings from flotation go to waste. Coarse copper in the grinding circuit is removed by tabling.

The slimes from the shore plant are settled in V-tanks which produce an overflow to waste and a thickened product which is further thickened in a Dorr thickener and then pumped to flotation where the copper is removed.

The dredge will work from eight to sixteen hours per day while the Shore and Regrind Plant will operate the twenty-four hours. The operating and maintenance force will consist of about 70 men.

Charles L. Lawton,
General Manager.

Electrical Substation

Item 1

Substation:

In Northwest corner of Regrinding Plant, and outdoor equipment nearby.

Item 2

Equipment:

One General Electric Co. transformer, serial No. 7152313, type CAPT, form D, 3 phase, 25 cycles. Voltage rating 13,800/2300. Continuous rating 5750 K.V.A., Supplemental rating 6000 K.V.A.

Price $12,115.00

Three General Electric Co. transformers, 75 K.V.A., serial Nos. 6583951, 6583952 and 6583953, type H, form KF, 25 cycles, 2400/4160 Y to 240/480 volts.

Price of Three 1,731.33

Three General Electric Co. transformers, 25 K.V.A., serial Nos. 7096604, 7096605 and 7096606, form KF, single phase, 25 cycles, 2400/4160 Y to 240/480 volts.

Price of Three 791.31

Three General Electric Co. transformers, 7½ K.V.A., single phase, 25 cycles, 2400/4160 Y to 120/240 volts.

Price of Three 611.46

One General Electric Co. 9-panel metal-clad switchgear unit, 3 phase, 25 cycles, 2300 volts.

Price 9,847.00 $25,096.10

Item 3

One General Electric Co. Horn Gap disconnecting switch type RK-6, T.P.S.T., 400 amperes, 15,000 volts.

Three General Electric Co. fuse disconnecting switches, type EKO-2, S.P.S.T., 15,000 volts.

Three General Electric Co. disconnecting switches, 15,000 volts, 400 amperes, type FA-101, S.P.S.T., outdoor type.

One General Electric Co. 12 ft. switch hook.

Two General Electric Co. outdoor current transformers, type JK-6, 15,000 volts, 600/5 amps., 25 cycles.

Two General Electric Co. outdoor potential transformers, type E-115, 13,800/115 volts, 25 cycles, 200 K.V.A.

Three General Electric Co. thyrite arresters, station type, single phase, for outdoor use on 13,800 volt ungrounded neutral circuit.

Item 3 - continued

One General Electric Co. outdoor oil circuit breaker, type FLO-2, 15,000 volts, 400 amps., 3 pole, interrupting rating KVA. 250,000.

Price of above No. 3 Items	$3,662.00

Item 4

Motor Generator Set:

One Westinghouse Electric & Mfg. Co. induction motor, serial No. 8084048, type CS, frame 761-C, style 27 M 756, of 60 H.P., 720 R.P.M., full load, 3 phase, 25 cycles, 440 volts, 68.5 amps., direct connected to a Westinghouse Electric & Mfg. Co. D.C. Generator, serial No. 8086050, Frame 133, style 27 M 755, of 40 Kw., 720 R.P.M., 125 volts, 320 amps.
Complete with starter. Price 2,300.00

Electric Transmission:

13,575 lbs. 2/0 stranded bare copper wire	2,617.49
103 cedar poles, 6½" tops, 35 ft. to 52 ft. length	773.80
9,140 lbs. second hand rubber covered 2/0 wire	1,740.40
275 ft. cedar fence posts	16.50
Electrical accessories	2,553.45

Grand Total	$36,759.74

July 25, 1944

Mr. W. Parsons Todd
President, Quincy Mining Company
68 Wall St., New York, 5, N. Y.

Dear Mr. Parsons:

I understand you are advised of the situation at the stamp mill regarding the loss of the big bank of transformers by lightning.

We are now running on three transformers rented from the Calumet & Hecla at $2.00 per day. These cores have been crated and are ready to ship to the factory for re-winding. The total cost would be about $2,000 and require about six weeks or more.

Now then, I have counselled that we withhold the shipment of the cores until we hear from you regarding your trip in Washington for I would doubt the advisability for obligating ourselves for $2000 on repairs if they are not going to be used immediately.

Accordingly, I will await your advice, whether or not we should send them in for the necessary repairs. However, if we ship them to the factory it might emphasize to the Metals Reserve Company our situation regarding general repair costs.

Kindly advise.

Yours very truly,

QUINCY MINING COMPANY
STAMP MILL BRANCH
HUBBELL, MICHIGAN

ELECTRIC MOTORS
&
EQUIPMENT

BY

ROBERT JARVIS

ELECTRIC MOTORS & EQUIPMENT AT STAMP MILL

TURBINE

A C Generator - No. 3868766
Type ATB - 2 - 2500 KVA
3600 - Form T
Amp. 628 Speed 3600
P.F. 80 o/o KW 2000
60 Cycle Volts 2300
GE

MG Set - Motor GE
Induction Motor
Model No. 9185
Type DT 327-4-50-1800
Form B Volts 2200
Amps 12 - 3 Phase - 60 Cycle
RPM Full load 1740
No. 3886636 - 50 H.P.

Generator D.C. No. 1250108
Compound Wound Form A58
Type RC 31B Amps 280
Speed 1800 - 1740
Volts 125
35 K.W. GE
1-Spare Armature

Starting for M.G. Set
Starting Compensator G.E.
CR-1034 Type Nr. 2722
Form H3P1
Volts PRI 2080
2300
Volts Sec 832.1768
920.1955
For Induction Motor
Type I Form KH-50
60 Cycle 3 Phase

SWITCHBOARD

Oil Circuit Breaker
No. 105366 K5
Type F A-200
V - 4500
GE
(Main Lighting Switch)

CONDENSER & AUXILIARY PUMPS

GE Oil Circuit Breaker
D.L. 105367 Type FK-5
T. Pole S-Throw
4500 V 200 AMP

Motor Driven Exciter
A.C. side
GE Oil Circuit Breaker
D.L. 105367 Type FK - 5
T. Pole S-Throw

HOUGHTON COUNTY

GE Oil Circuit Breaker
No. 91915 Type F
Form K-5 A-300
V- 7500

BOILER HOUSE

GE Oil Circuit Breaker
D.L. 105367 Type FK-5
T. Pole S-Throw
4500 V 200 A.

Spare
GE Oil Circuit Breaker
D.L. 105367 Type FK-5
T. Pole S-Throw

NO. 1 MILL

GE Oil Circuit Breaker
No. D.L. 91914 B-2405
Form K5 A 500 V 7500

MAIN SWITCH

GE Oil Circuit Breaker
No. 125327 Type FK 12
Amps 800 V 15000

TWO TRANSFORMERS

GE Type H Form K
60 Cycle 50 KVA
No. 1938618
Oil 59 Gal.
Volts
220/110/220
2300/115/230
2400/120/240
3½% IMP

GE No. 2023024
Type H Form K 60 Cycle
Capacity 50 KV-A
Oil 59 Gal. 3½% IMP
Volts
220/110/220
2300/115/230
2400/120/240

CONDENSER PUMP MOTOR

GE Model No. 9006
Type KT 356-12-60-600
Form B 3 Phase 60 Cycle
Volts 220 Amps 157
No. 3746995 60 H.P.
Speed 570 Full load

CONDENSER PUMP STARTER

GE CR-1034 Starting Compensator
Type NR 5257-N-1
Volts Pri 220
Volts Sec. 88-187
60 H.P. 50° C
50 H.P. 40° C
60 Cycle 3 Phase

Aux. Pump Motor
GE No. 3106877
Type KT
750-4-7½-1800
Form C Cyc. 60
3 Phase RPM 1750 F.L.
Volts 220
Amps 19.7
H.P. 7½

AUX. PUMP STARTER

GE CR- 1034 Starting Compensator
Type NR 5006-R-1
Volts Pri. 220
" Sec. 110-176
For Motor 7.5 H.P.
60 Cycle 3 Phase

Small DC Motor on Turbine Speed Governor
No. 590318 Type SDA
Wound Series Form D. H.P. ½
R.P.M. 1800 V-125 - A 1.7

HEAD RUNNERS FLOOR

No. 1 Motor

No. 1.

Make - GE No. 820319
Type 1-14-125-514
Form P. 60 Cycles
125 H.P. 22 Amps
158 Amps Sec. Volts 2200
Speed 514-495

GE Resistance Type Oil Switch
Panel No. 155589
Type - ATL 125 A H:
Amps - 41 Volts 2200

Thomson Watthor Meter
No. 3685552 Type D-3
60 Cycle AMP 50
Volts 2200

GE Ammeter
50 Amps No. 380775
Type R.F. Amp - 5

Drum Type Controller T-108B No.325962
No. 1. Current Instrument Transformer
No. 145 1093 Spec. 229309
Type - S Form - W2
Cyc. - 25-125 Ratio 10-1
Volts 4500 Amps 50

No. 2. Current Instrument Transformer
Same as above No. 1451086

No. 2.

No. 2 Motor

Make GE No. 1778140
Type I-12-100-500
Form M Volts 2200 3 Phase
60 Cycle Amps 25
Sec. Amps 100
40°C 25% Overload
2 Hrs. 55% C.

STARTER

Resistance Type Oil Breaker
Volts 2500 Amps 60

Over Load Coils 30 Amps

GE Ammeter 80 Amp.

GE Polyphase Wahmeter
No. 6664611 Type - DS-6
5 AMP 60 Cyc. 110 Volts

No. 1. Potential Inst. Trans.
No. 2269378 Spec 233206
Type - E12 V.A. 50 60 Cycle
Volts 2200 - 1100

No. 2. Potential Inst. Trans.
Same as Above No. 2265493

No. 1. Current Inst. Trans.
No. 2264540 Spec. 371328
Type - W2 Cyc. 25 - 125
Ratio 8-1 Volts 4500
Amps 40

No. 2. Current Inst. Trans.
Same as above No. 2202710

Drum type controller
No. 361115 T1084

Three Banks of Resistors

No. 3.

No. 1. Shafting Motor
Make GE Model No. 5858
Form P Type 1-52-14-75
514 3 Ph. 60 Cyc. Volts 2200
Amps 20 Sec. Amps 140
Speed F.L. 495
40°C 25% Overload 2 Hrs. 55°C

GE Resistance Type Oil Switch No. 84288 Type AQ-1

Relay No. 26257 Type P
Form C-2
Relay No. 28052 Type P
Form B-2
Class 5-4-9

Ammeter 60 AMP
Type - RF-No. 498172
5 AMP
C. Trans. 12-1

Thomson Wattmeter
No. 2125373 Type DS4
AMP 30 60 Cycle
Volts 2000/2200
No. 1.
Potential Trans.
No. 755591 Spec. 101645
Type P. Form B. Watts-50
Volts 1100/110

Jan. 10, 1945.

Mr. W. Parsons Todd, President,
Quincy Mining Company,
65 Wall Street,
New York 5, N. Y.

Re: Reclamation Plant

Dear Mr. Parsons:

Following your letter request of the 28th. ult., would advise that we herewith enclose a resume report of the installations of the increased efficiency equipment at the Reclamation Plant together with annotation of the costs of expenditures thereon to Jan. 1st. We trust that you will find them satisfactory.

All of the work now going forward should be completed within something like two weeks.

There remains the installation of the operating mechanism on top of the big 35 foot surge tank, which has not been received. Promised delivery Feb. 1st. And the classifier.

This latter has been deferred at this time, because it is the consensus of opinion that in the operations of the additional equipment, may prove it will be unnecessary to install it.

The painting, naturally, will be deferred until spring.

With all these cared for, there will still remain, the question of installing the railroad scales at a cost of $4,000.00 and automatic final mineral sampler at a cost of $750.00. These are very necessary for the checking of the daily operations of the various equipment and operating mechanisms about the plant. This to obtain its highest efficient capacity.

The automatic feature of the sampler eliminates the human equation and tends to reach more positive and earlier facts and, thereby, conclusions in the routine operations of the plant.

Yours very truly,

GENERAL MANAGER

Reclamation Plant

Statement of Cost of Construction as of Jan. 1, 1945.

	Material	Labor	Total
Dorr 35 ft. Thickener	$780.57	$2934.55	$3715.12
Shore Plant Addition including its equipment	3825.13	6710.74	10535.87
V Tanks Main Bldg.	684.62	356.49	1041.11
Density Controllers	411.02	-	411.02
Garage	248.14	752.81	1000.95
Adit--Contract	-	-	8160.00
Totals	$5959.48	$10754.59	$24864.07

Jan. 10, 1945.

Reclamation Plant
Efficiency Construction and Installations

As of Jan. 1, 1945, the construction and efficiency installations at the Reclamation Plant had progressed as follows:

Water Adit to the Main Pump

The water adit to the main pumping plant was extended 300 feet and completed. It is operating as expected and therefore satisfactory.

The Shore Plant Addition

The addition to the shore plant 41' x 48' is a steel fabricated structure with wood sheeting and corrugated iron, the same as the main building. It was completed on its concrete foundation. The concrete floors and the concrete piers for the V tanks have been finished. Thus, all shore plant concrete has been completed. Part of its heating system has been installed. The lumber for its V tanks is at the Calumet & Hecla mine carpenter shop for fabrication and should be ready for delivery to the plant the first week in January. The erection of the V Tanks, their feed and overflow launders and spigot boxes remain to be installed.

The Main Plant Building

In the main building the concrete piers for the V tanks are completed. All concrete of the 35 foot thickener is completed. The mechanism for the 35 foot thickener has not been received. It is due about Feb. 1st. There remains the building of the V tanks, their feed and overflow launders and spigot boxes together with the feed and overflow launders for the 35 foot thickener. All material for these have been fabricated at the Plant.

Pulp Density Controllers

Three pulp density controllers have been received, Have been installed and are now in satisfactory operation. The remaining three are on order.

The Garage

The sills for the garage are in place and all material for the garage is at the site.

All installation work is progressing satisfactorily towards completion.

Jan. 10, 1945.

THE

QUINCY RECLAMATION PLANT

On account of its great need of copper for the war effort the United States Government financed and constructed the Quincy Reclamation Plant at a time of the highest wages and supply costs.

Accordingly, the income from the operations of the plant at this time is being utilized to reduce that excessive cost.

The plant was designed for an annual production something like 10,000,000 pounds of copper. The operation has shown actual capacity of 6,000,000 pounds.

The structures are purely of used second-hand steel material. Therefore, are worn, not new. Its amoritization value should start with a high charge off.

Furthermore, it was constructed during a period of very high costs in wages and supplies. Therefore, during normal times, it would not have the value that it cost. This was brought about by the war conditions and the Government's desire to use as small an amount of new structural material as possible.

The equipment consists very largely of used machinery. This again on account of the Government's wishes together with the inability to obtain it new at that time.

The electrical power is made up largely of used motors of almost obsolete, 25 cycle, type. Again, in an ordinary period, it would have greatly decreased salvage value.

The reason for the plant, that is, the desire for it, was to obtain quick additional copper for the war effort. Therefore, at this time, it is operating by treating stamp sands of the richest tenor; the cream of the stamp sands. Practically all of this grade will have been treated by the time the Government is reimbursed of its investment.

Con'd.

Accordingly, the financial results of the past year should be way above average, as the years go by. The copper contents of the stamp sands as deposited were governed throughout the years by the known treatment information or milling process of those times.

In the early days the stamp heads reduced the ore to the jigs and tables. In 1908 crushing rolls were installed. Later in 1916 the ball mills were installed. Again later in 1929 flotation machines were installed.

At each step the copper contents in the sands were markedly reduced until those deposited since just before the flotation machine have no commercial value.

However, if the present plans of installing equipment to increase the capacity and efficiency at the plant are carried out, it is expected that the sands left after those that have been consumed or treated to pay the Government, that they will still have a commercial value. The treatment, thereof, then accruing to the labor of the community, the State of Michigan, and the Quincy Company.

The future value of those sands, then remaining, is more or less problematical at this time, especially regarding the physical condition of its copper relative to amenability for successful treatment in the plant.

Feb. 19, 1947

Mr. Franklin G. Pardee,
Deputy State Geologist,
Department of Conservation,
Lansing 13, Michigan

Dear Sir:

During 1946 the Quincy Reclamation Plant finished working the higher gradd sands. A very definite drop in copper content started in September 1946 and has since continued, as can be clearly seen in the following tabulation of Metallurgical results for the last five months:

Month	Tons (Dry) Treated	Headings (Assay)	Tailings (Assay)	Copper Recovered (Smelter)	Lbs. per Ton (Smelter)	Year to Date
Sept. 1946	98,452	6.95	2.12	467,028	4.74	5.40
Oct. 1946	101,190	6.67	2.22	434,860	4.30	5.27
Nov. 1946	93,700	6.74	2.42	374,266	3.99	5.14
Dec. 1946	90,080	6.56	2.36	341,915	3.80	5.02
Jan. 1947	89,409	6.57	2.32	337,282	3.77	3.77(1947)

The richest sands were deposited previous to 1902. These are now exhausted except some shallow and high bank deposits along the shore line. The high bank deposits are heavily oxidised and run to high tailing losses.

Sands deposited after 1910 will show a still farther drop in copper content because regrinding was introduced in the Copper Country about this time.

Considering the above facts it can plainly bee seen that we have exhausted the higher grade sands and that those remaining are not of much value except during the period of the Premium Price Plan to June 30, 1947. It is hardly probable that Congress will authorise any extension of this premium, and therefore, after July first next we will have to depend on the normal price for copper, and we cannot consider valuing the remaining sands on the basis of the present price of 19½ cents per pound for copper. This price may continue for some time but no one is justified in figuring the value of copper in the sands that may be recovered after Jan. 1, 1948 on any such basis. Therefore, the Reclamation Plant is reduced to a point where from the standpoint of tax valuation the estimated scrap value of the plant should be given due consideration.

This plant has only been in operation 3½ years but was not a new plant originally. The building and most of the equipment was moved from a C. & H. operation, where it had many years service.

We feel that the sands from No. 2 Mill should not have any tax value at this time. Very little of these sands were deposited before 1902, (about three hundred thousand tons) along the shallow shore line, and later covered with low grade sands. In order to handle these sands a large equipment and pipe line expenditure must be made and the future copper market uncertainties may not make this possible.

During 1946 we were forced to make wage and salary increases of 30%. The cost of supplies were up at least 25%. The increase in power charges, due mostly to longer discharge lines, was up 20%.

The above figures takin in consideration with a recovery drop from 5.02 to 3.77 lbs. per ton, or a 25% drop, does not hold out much hope for the future, but justifies our claim for a downward adjustment of the Reclamation Plant valuation.

Enclosed find map which I think will give you a clear picture of the Reclamation operation.

Yours very truly,

C. J. McKie

Dec. 7, 1953

Mr. Harry J. Hardenberg,
Deputy State Geologist,
Department of Conservation,
Lansing 13, Mich.

Dear Mr. Hardenberg:

The Quincy Reclamation #1 sand pile has been exhausted and work on #2 pile was started about Nov. 1st. In order to work #2 pile a booster pump and motor were installed and also a diesel generator. These installations and long pipe line cost about $250,000.00.

The work on #2 stamp sand pile has not been over long enough period to be reliable, but so far are discouraging. Our November product will be 20% lower than usual.

The cost of supplies is constantly going up. Due to the installation of booster pump and long pipe lines our power costs are going to be 1½ cents per pound higher. Labor was advanced the equivalent of 12 cents per hour on June 1st., 1953.

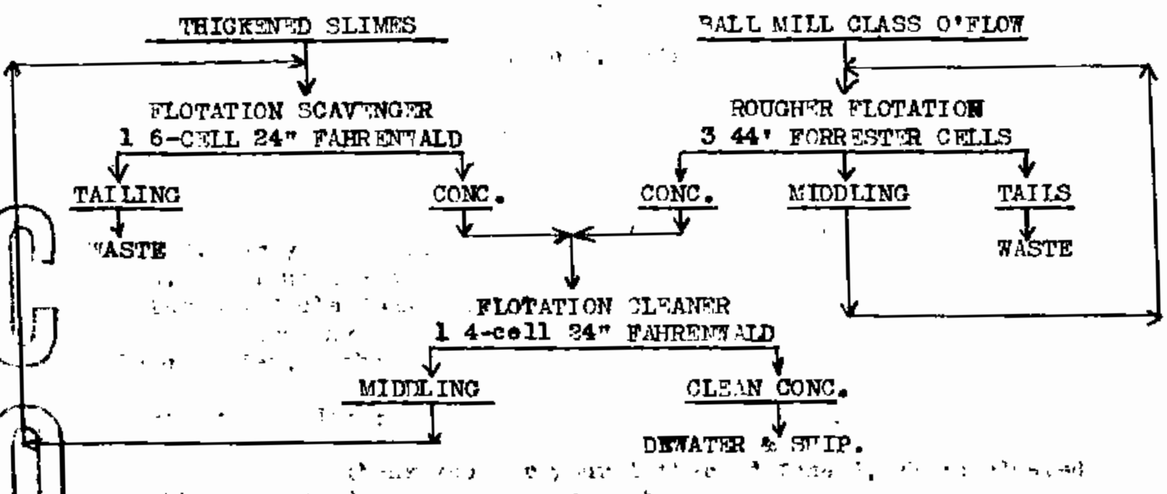
In view of the above I believe a cut in our Reclamation Plant assessed valuation of about $50,000.00 would be in order.

Yours very truly,

C. J. McKie

QUINCY RECLAMATION PLANT

PRESENT FLOWSHEET I



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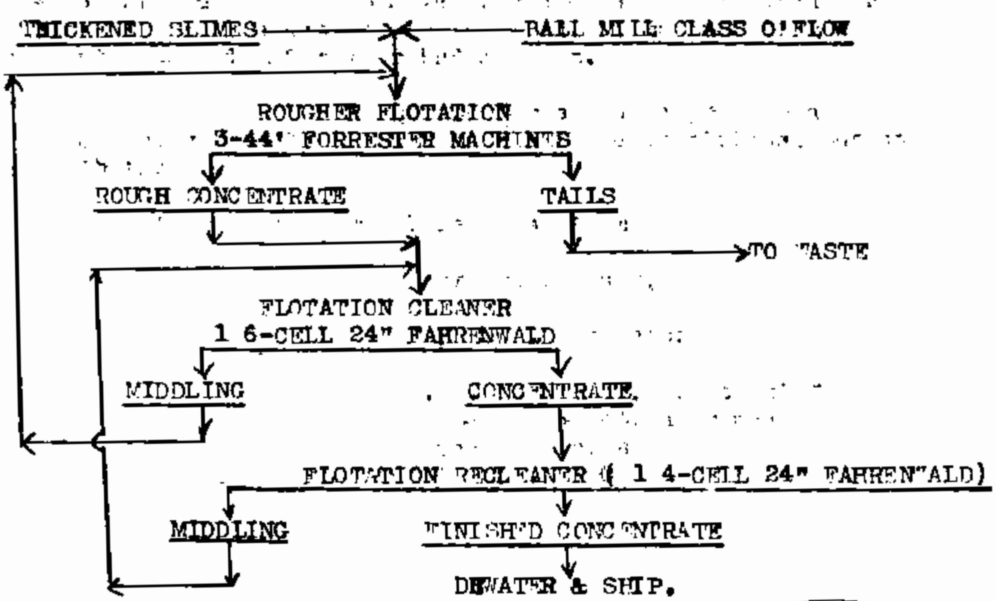
PROPOSED FLOWSHEET II



Tech MS-002
Box 522
Folder 1

Electric power for the operation of the Quincy Reclamation project will be furnished by the Calumet and Hecla Consolidated Copper Company.

This power will be transmitted at 13,800 volts, 25 cycles, 3 phase, ungrounded, over a circuit of 250,000 c.m. stranded copper wire, supported on 1-3/8" pin type insulators.

Cedar poles are to be used and have mounted on same one 5" x 6" cross arm and a ridge iron to arrange the circuit in a 36" Delta. The poles will be spaced approximately 100 ft. apart and the bottom wire will be approximately 30 ft. from the ground.

This circuit will terminate at the incoming oil circuit breaker at the substation of the Quincy plant and power will be metered at this plant and connected to the Calumet and Hecla power system at the Ahmeek plant, a distance of about 2-1/2 miles.

Substation

At the site of the regrinding building there will be installed a pole structure to support the necessary buss arrangement, etc., and at this point 3 single phase, oil filled, self cooled, outdoor type transformers, oil circuit breaker, current and potential transformers, lightning arresters, etc., will be installed.

The transformers will be 1667 Kva. each, primary voltage 13,800, secondary voltage 2,400.

The secondary of the transformers will be brought into the building and connected to the buss of the distributing switchboard.

The switchboard will control the various feeder circuits and the necessary metering instruments.

All outgoing 2,400 volt circuits will be provided with lightning arresters both on the station and receiving ends.

Dredge

Power for the dredge will be transmitted at 2,400 volts over an independent circuit, supported on a structure built on the pontoons and supported by porcelain rack insulators. The conductors to be rubber covered.

This circuit will terminate in an oil circuit breaker which in turn will connect with the buss of a distributing switchboard for the control and metering of the various circuits within the dredge.

Shore Plant

Power for this plant will be transmitted at 2,400 volts and terminate in an oil circuit breaker from which the various motors and control will be connected.

Main Pumping Station

This plant will be located some 2,500 ft. from the main plant and power will be transmitted at 2,400 volts over a separate pole line.

Regrinding Plant

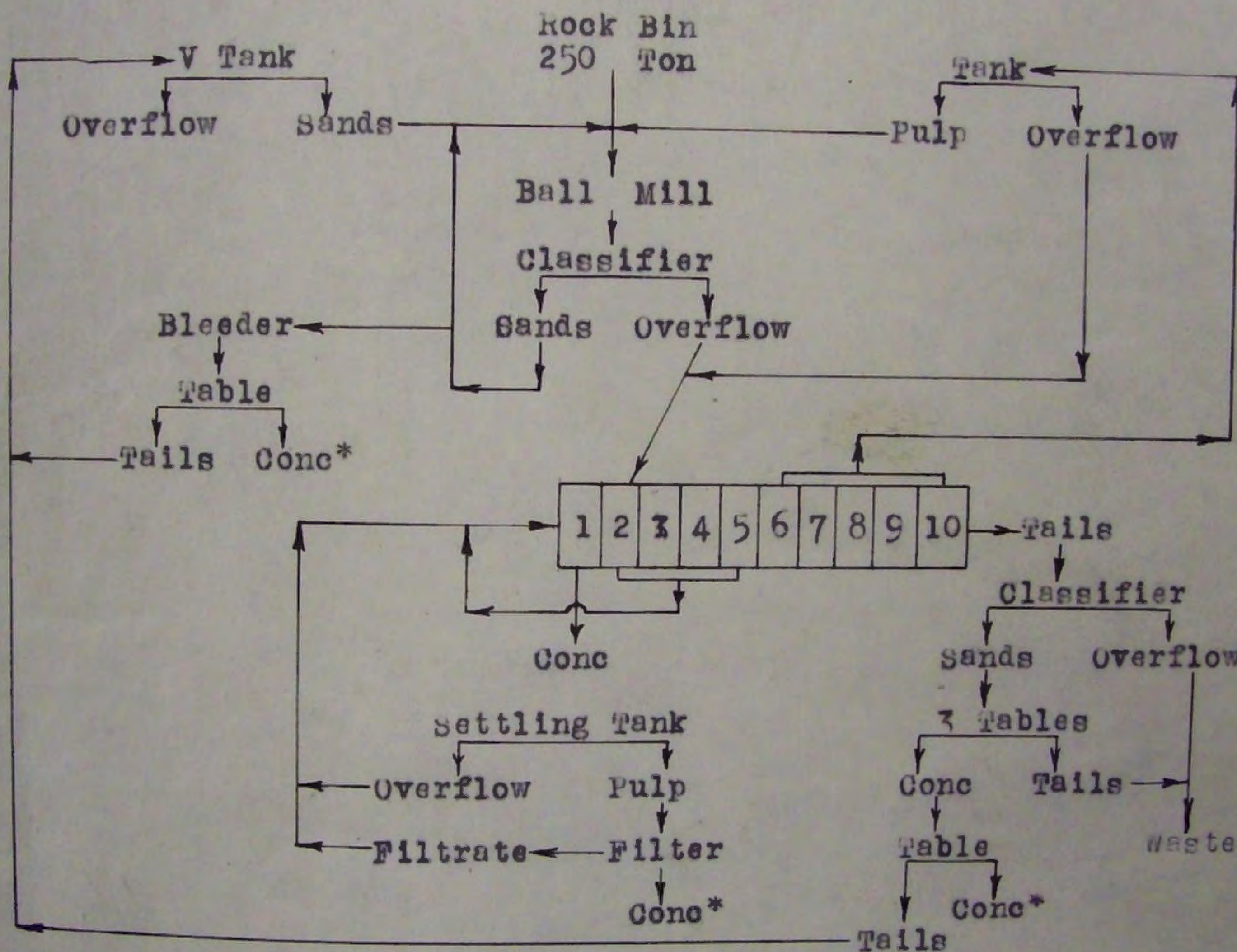
Power for the operation of the various drives inside this building will be controlled from the various panels on the main switchboard.

All wiring within the buildings will be done with approved rubber covered wire and supported by wire racks with porcelain insulators, with the exception of wet or hazardous locations where the wiring will be put in conduit.

QUINCY MINING COMPANY--STAMP MILL

No. 1 Unit

Reclamation of Old Tailings



Reclaiming Quincy Tailings From Torch Lake

C. HARRY BENEDICT, Chief Metallurgist,
Calumet & Hecla Consolidated Copper Co., Lake Linden, Mich.

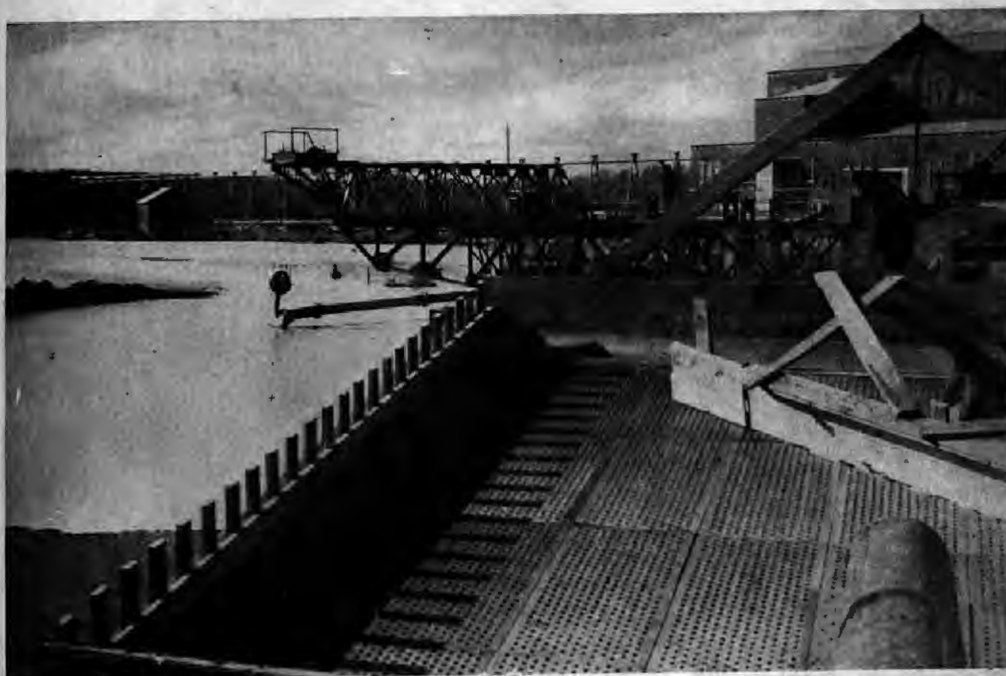
NEW SUCTION DREDGE at work on Quincy's bank of amygdaloid sands in Torch Lake. The suction pipe, which is carried on the pontoons, delivers to the screen at the storage pool at the shore plant

Wartime demand added its incentive to the proposal to recover the copper from the 50-year accumulation of tailings which Quincy Mining Co. had stored in Torch Lake, in the Michigan Copper Country—a venture that previously had seemed unlikely to return the necessary investment. Once a favorable decision was reached, Calumet & Hecla Consolidated Copper Co. was chosen by Quincy and the Metals Reserve Co. to design the plant required and put it into successful operation, and to serve as trustee in letting the contracts. The plant was started in November, and the entire operation has been under the direct supervision of Mr. Benedict, who contributes this article

THE CONCENTRATING PLANTS, or stamp mills, as they are known locally, of the Lake Superior copper district in northern Michigan are located either on the shore of Lake Superior or of some one of its tributary inland lakes. Along one of these, Torch Lake by name, are situated the mills of the Calumet & Hecla Consolidated Copper Co. at Lake Linden, the old Tamarack mill at Hubbell, and the Quincy Mining Co.'s stamp mill at Mason, the distance between the extreme plants being about 4 miles.

Torch Lake is peculiarly well adapted for the receipt of tailings from a concentrator and in turn for recovering them by dredging out of the lake. The shores slope gently to the water's edge and the lake itself is very deep for its area. This makes for a compact body of sand which lends itself readily to dredging and the transportation of the material to the only slightly elevated plants along the lake shore.

Calumet & Hecla has been operating two such re-treatment, or reclamation, plants for many years with great success. The material treated in them has until recent months been conglomerate sands or tailings derived from treating the ore of the very rich Calumet conglomerate lode. Almost 500,000,000 lb. of copper has been reclaimed from Torch Lake since 1915 from this source. For many years the success of this operation naturally has attracted attention to the possibility of the economic development of the lower-grade amygdaloid deposits which constitute the other large tailing piles in this district.



AT THE STORAGE POOL the sands deliver[illegible] the dredge are discharged onto this rubbish screen. [illegible]rom the pool they are pumped to the shore plant through a line suspended from the radial bridge

Commercial possibilities of the Quincy sand bank had long been recognized by the Quincy management, but the development was considered a marginal venture at best, not to be undertaken at the price of copper prevailing in recent years. It was believed that the material might be treated at an operating profit at 12c. copper, but it was more questionable whether the returns from such an operation would be adequate to pay an annual interest as profit and also return the original investment. With the outbreak of the war and the need for as large a supply of copper as possible, the project seemed worth undertaking. Inasmuch as the capital could be obtained from the Metals Reserve Co., and a premium for copper in excess of 12c. was also forthcoming, advantage was taken of these favorable conditions and an application for funds was made and was approved by WPB and Metals Reserve.

The Quincy mill, from which these tailings were deposited, began operations more than 50 years ago. The ore in those days near the surface was richer than in subsequent years at depth. The earlier metallurgical processes, moreover, were crude, so that the tailing bank showed in general a progressive decrease in values from the older near-shore deposits outward in all directions to the circumference of the pile. It was recognized that it would not be profitable to dredge the entire bank; and accordingly, only the more favorable area was chosen for retreatment. This was staked out by the Quincy officials and carefully sampled by the metallurgical department of the Michigan College of Mines.

Sampling Procedure

A rectangle 1,200 ft. long and 450 ft. wide, embracing the richest part of the sand, was surveyed, and this was divided into 12 squares, each 300 ft. long by 150 ft. wide. In the center of each the sampling hole was churn drilled. The entire contents of the hole were sampled, each 6 ft. of depth constituting an individual sample. From these samples an average value of the contents of the sand was obtained, which was applied to the tonnage as represented by the rectangle. In this manner, allowing for sloping banks, the average tonnage was calculated, and from the assay value of the sand, the copper contents.

Based on previous experience in the Quincy concentrator and with test runs in a pilot plant treating this same sand, the anticipated metallurgical results were set forth by the Michigan College of Mines. Tonnage and values disclosed was sufficiently promising to warrant the expenditure of $1,150,000, estimated as the cost of the plant.

The material finally to be dredged was not to be limited to the portion outlined and sampled. This amount of sand, it was understood, would probably yield the capital expenditure, at a return to Metals Reserve of 4c. per pound of copper. When operation of the dredge began it started at the outer corner and on what was probably the leanest part of the section sampled, and the preliminary results to date seem to indicate the accuracy of the sampling and of estimating the reserves.

Net results of this sampling showed sufficient tonnage of sand at an assay value that promised to return the plant cost within a reasonable time, and Metals Reserve undertook to furnish the capital necessary for the venture, amortization to be made by Quincy company at a fixed sum per pound of copper produced.

Inasmuch as Calumet & Hecla had had many years experience with the dredging of sands and conveying this material to the treatment plants along the shore, as well as with the recovery of the values from the sands, it was chosen by Quincy and Metals Reserve to design the plant and to act as trustee for the two companies so far as the design work and letting contracts were concerned, and also to put the plant into successful operation. The preliminary features of this venture have all been successfully accomplished, and since Nov. 1, 1943, the plant has been operated by the Quincy Mining Co. personnel.

In designing the plant, the features successfully proved by Calumet & Hecla for dredging and classifying the sand and conveying it to the treatment plants were followed closely. Metallurgical treatment follows the general practice used on the amygdaloid sands as distinguished from the treatment of conglomerate sands. The main difference is that good recoveries of copper can be obtained from the amygdaloid sands by fine grinding and flotation, whereas on the conglomerate sands it is necessary to use leaching to make satisfactory recovery of the fine copper.

Plant of Four Units

The plant as a whole consists essentially of four main units:

1. A floating dredge for sucking the sand from the lake and propelling it through a flexible pipe line supported on pontoons to a fixed point on the shore.
2. A shore plant or classifying house which comprises a stationary dredging pump and a radial bridge carrying the suction pipe of the pump, in addition to machinery for classifying the pumped product into coarse material requiring regrinding and fine material or slime ready for flotation.
3. A gallery housing a belt conveyor to convey the coarse sands from the shore plant to the regrinding plant and into a surge or storage bin at the end and highest point of that plant.
4. A regrinding plant and concentrator equipped with ball mills and flotation machines, with the necessary equipment for dewatering the sands and filtering the flotation concentrates.

The dredge was designed by the Bucyrus-Erie Co., South Milwaukee, Wis. Hull and house are of wooden construction and were built by R. C. Buck, Inc., of Superior, Wis. The dredge is capable of cutting its own flotation and digging to a depth of 70 ft. below water level with the ladder inclined at 45 deg. All machinery units and pumps are arranged for direct drive, using 3-phase, 25-cycle, 2,300-volt current, which is delivered to the stern edge of the hull via the pontoon line. The 20-in. pump, complete with 1,000-hp. motor, coupling, and sub-base, was furnished by Calumet & Hecla. All other machinery was obtained from or through Bucyrus-Erie.

TRIPLE-BELT DRAG CLASSIFIER in the regrinding plant. The sands are delivered to the storage, or surge, bin ahead of the grinding mills. The fines after settling and thickening go direct to flotation

IN THE REGRINDING PLANT the sands are ground in ball mills operating in closed circuit with spiral classifiers, the overflow of which goes to flotation

The ladder for supporting the outboard suction pipe is 95 ft. long and of the latticed-girder type, with wire-rope side guys anchored to hinged-pivot connecting brackets located on the deck of the hull. It is raised and lowered by means of a hoist drum mounted as a separate unit on the port-side winch sub-base. In addition to this ladder hoist, the portside winch consists of three drums which control the port-ladder swing line, the port-bow swing line, and the port stern line. The starboard winch consists of four units controlling the center stern line in addition to the corresponding units on the port side.

Besides the main dredge pump there are two 8-in. motor-driven pumps, each capable of delivering 2,500 g.p.m. against a total head of 175 ft. These pumps are for the dual purpose of delivering high-pressure water to the mouth of the suction pipe, so as to disintegrate the sand bank in advance of the ladder, and to supply pressure water for breaking up the ice in the dredge pond during the winter.

In dimensions, the hull is 100 ft.

long, 56 ft. wide, and 9 ft. deep. It has overhanging deck brackets 8 ft. wide on each side. It is built with a center well for the suction ladder and with the bow corner tapered to permit digging close to the bank. The bow gantry for supporting the ladder-suspension tackle and the two main longitudinal hull trusses are of structural steel. It has multiple watertight compartments.

The suction line consists of 20-in. inside-diameter pipe, ⅜-in. thick. Connection between ladder and hull is made by means of a swivel elbow and rubber suction hose. The lower end of the pipe on the ladder terminates in a special suction-head casting having a water chamber fitted with nozzles for high-pressure jets to loosen the material ahead of the ladder.

Built of 20-in. outside diameter steel pipe, the dredge discharge is made up into 60-ft. lengths and carried on wooden pontoons. The individual pipes are connected with rubber sleeves, and current for operating the dredge is transmitted from shore through wires carried on towers supported on the pontoons.

The hull was constructed in midwinter on one of the sloping tailing piles along Torch Lake and was launched by cutting its passageway through ice some 2 ft. thick. The machinery for the dredge was on hand by April 1, 1943, and late in August the dredge was in place and ready for operation.

Care was used in choosing the site of the shore plant. This was decided upon after preliminary sounding and drilling and was located in such a position as to permit easy dredging out of the basin which would serve as storage pool for incoming sand and to provide also the shortest distance possible for conveying sand to the regrinding plant. The main dredge pump of this shore plant consists of a 12-in. Morris centrifugal pump, the suction pipe of which is carried on a radial bridge. This bridge is pivoted just outside the structure, the circumferential track having a radius of 35 ft. The bridge extends another 20 ft. beyond the track, and the suction line has a vertical leg 35 ft. long, so that the storage pool consists roughly of a circular basin of about 270 deg. with a radial dimension of 55 ft. The storage thus provided is ample for about 72 hours of operation.

Sand Classification

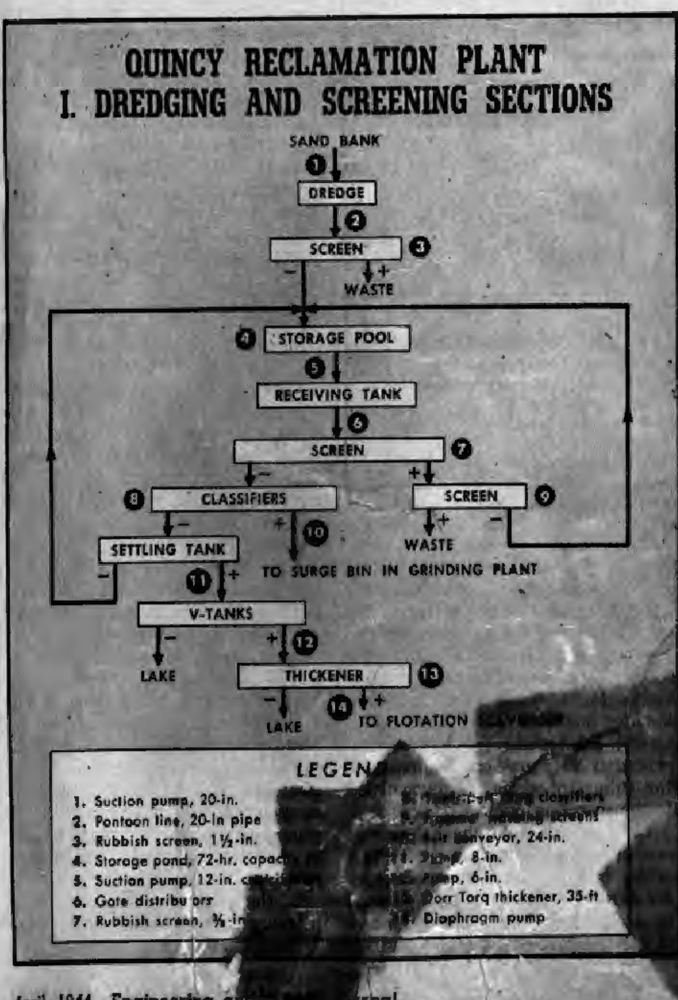
The discharge pipe from the pump empties into a distributing bin which feeds the sand, controlled by gates, onto a screen with ⅜-in. openings to screen out the coarse rubbish. Material passing through the screen goes to a triple-belt drag classifier, the sand discharge of which drops onto the conveyor belt. Classifier undersize goes at about 35 mesh into a series of V-tanks, the thickened plug product of which is pumped directly into the regrinding plant, overflow going back to the pool.

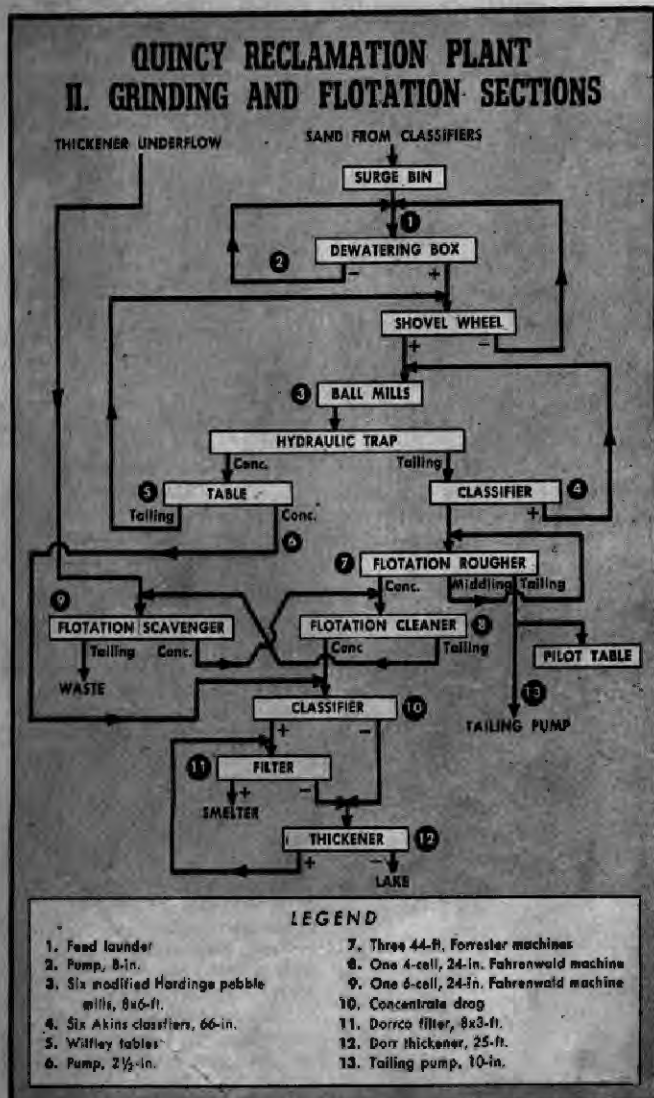
Consisting of a 24-in. belt 260 ft. long between supports, the conveyor is set at an angle of 10 deg. 45 min. It is equipped with an automatic recording weighing scale, so that tonnage record is available. It discharges into a storage or surge bin of sufficient capacity to take care of minor interruptions in operations up to that point. From this bin hand-operated slide gates control the sand fed to the mills.

The main structure is a building with a crane span of 28 ft. and two side wings of 48 ft., giving a total width of 124 ft. and length of 255 ft. It has direct railroad connection for incoming supplies and outgoing concentrates. It was dismantled in sections at Lake Linden, where it formerly housed regrinding machinery for Calumet & Hecla, and re-erected at Quincy.

Only a little new critical material was required for this building, and in general much used machinery went into the equipment throughout. This was one of the factors that appealed to both the Quincy Mining Co. and Metals Reserve, and made the proposal doubly attractive at the time. In addition to the building, the mills used for regrinding came originally from Calumet & Hecla, having been employed at that plant as pebble mills. To convert them to ball mills, it was necessary to increase the size and strength of the driving gears and pinions and the area of the trunnion bearings. The shells themselves, however, were the original Hardinge shells used at the Lake Linden plant.

These ball mills, six in number and 8 ft. in diameter by 72 in. in cylindrical length, are each in closed circuit with a ... Akins classifier. Between





mill discharge and the classifier, a hydraulic discharge is inserted to avoid building up coarse copper in the circuit. The plug product goes to a Wilfley table, the table tailings being pumped back into the circuit. Overflow from two of the Akins classifiers goes to a Forrester flotation machine 44 ft. long. Six of these ball-mill units and three Akins classifiers constitute the original grinding and concentrating sections of the plant.

The slimes classified out in the shore plant which do not require finer grinding are pumped to a series of V-tanks in the wings of the regrinding plant. Here they are thickened and pumped to a 35-ft. Dorr T[illegible] thickener to iron out the variations in tonnage of this product, which is very irregular because of the nature of the operation. The thickened product is pumped by a diaphragm pump to a six-cell Fahrenwald flotation machine. Concentrates from the Forrester flotation machines and those from this six-cell Fahrenwald are further concentrated in a four-cell Fahrenwald, the tailings of which are recirculated to the six-cell machine.

Concentrates from the Fahrenwald machine, with those from the Wilfley table treating the plug product of the closed-circuit system, are pumped to a dewatering tank and by means of a drag conveyor are fed to a[illegible] watered in an 8x3-ft. Dorrco filter. The drag overflow goes to a 25-ft. Dorr thickener, the thickened product of which joins the drag product at the filter. The filter discharges into 50-ton cars for transportation to the smelter.

Flotation follows the standard practice of the district, xanthate and pine oil being the only chemicals used. The sands contain a certain amount of oxidized copper, which may become proportionately greater as the dredge gets into the richer and nearer shore parts of the bank. Up to the present there has been little difficulty from this, and sodium xanthate with pine oil seems ample to make a satisfactory recovery without the need of sulphidizing chemicals. Recovery is not as good as in the stamp mills, due in some measure to the slight amount of oxidized copper present, but more particularly to the irregularity of tonnage and the irregularity in relative size of feed particles.

Fluctuations in Feed

This condition is inherent in the nature of the operation, and there seems to be nothing that can be done about it, as the deposit in place has areas of coarser and finer sand, and this is accentuated in the shore plant basin, where the coarser material naturally deposits out close to the dredge discharge and finer particles float to the more distant parts of the pool. There are certain times when the material pumped is all fine and other times when there are practically no fines, so that there is a tremendous fluctuation not only in the ball-mill feed but also in the slime product going directly to the flotation machines.

The project is unique among Metal Reserve contracts in that it was built for the amount originally asked for, which was $1,150,000 for construction. To this later was added $50,000 for a month's tuning up and operation and to purchase advance supplies and equipment sufficient to take care of consumption of balls, ball-mill liners, and spare pump parts for a short period.

Credit for the smooth mechanical operation of the plant is due to the engineers of the Calumet & Hecla company. Metallurgical results have not been announced, and it is too early to evaluate them except to say that the plant is operating at a profit to date, aside from the margin of 4c. per pound of copper for amortization. Inasmuch as the dredge is situated in the [illegible]st part of the sampled area, and [illegible] metallurgical results will improve with experience, it is fair to assume that the plant will make good the [illegible] of its sponsors, the Quincy [illegible]