# CONSTRUCTION REPORT

## MINERAL BUILDING
## SOURCE REMOVAL
## TORCH LAKE AREA OF CONCERN
## HOUGHTON COUNTY, MICHIGAN

*Prepared for:*

U.S. Environmental Protection Agency Great Lakes National Program Office and Honeywell

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# LIST OF ACRONYMS

| | |
|---|---|
| ACM | Asbestos Containing Material |
| AOC | Area of Concern |
| BUI | Beneficial Use Impairment |
| C&H | Calumet and Hecla |
| cyd | Cubic Yard |
| EnviroBlend | EnviroBlend© SP |
| EGLE | Michigan Department of Environment, Great Lakes, and Energy |
| f/cc | Fibers per Cubic centimeter |
| GPS | Global Positioning System |
| GLNPO | Great Lakes National Program Office |
| Honeywell | Honeywell International Inc. |
| NREPA | Natural Resources and Environmental Protection Act |
| OSC | Ontario Specialty Contracting, Inc. |
| PA | Project Agreement |
| PEL | Permissible Exposure Limit |
| PCBs | Polychlorinated Biphenyls |
| PPE | Personal Protective Equipment |
| ppm | parts per million |
| PWLSA | Portage Lake Water and Sewage Authority |
| RAWP | Remedial Action Work Plan |
| RCRA | Resource Conservation and Recovery Act |
| SESC | Soil Erosion and Sedimentation Control |
| Silver Shore | Silver Shore Enterprise, LLC |
| site | Mineral Building property |
| TCLP | Toxicity Characteristic and Leaching Procedures |
| µm | Micrometer |
| UOP | Universal Oil Products |
| USEPA | United States Environmental Protection Agency |

| | |
|---|---|
| WM | Waste Management |
| Wood | Wood Environment & Infrastructure Solutions, Inc. |

# 1.0 INTRODUCTION

This Construction Report was prepared by Wood Environment and Infrastructure Solutions, Inc. (Wood) on behalf of the United States Environmental Protection Agency (USEPA) Great Lakes National Program Office (GLNPO) and Honeywell International Inc. (Honeywell) to document source removal activities completed at the Mineral Building property in Houghton County, Michigan (site), as illustrated on Figure 1.

## 1.1 Purpose and Scope

The purpose of this report is to document construction activities completed at the site. These activities included:

- Waste characterization
- Treatment/stabilization of characteristically hazardous waste to render it non-hazardous
- Waste piles removal and disposal
- Site restoration

# 2.0 PROJECT BACKGROUND

USEPA GLNPO and Honeywell signed a Project Agreement (PA) under the Great Lakes Legacy Act to complete a Focused Feasibility Study (FFS) to address contaminated sediment within the Hubbell Processing Area (HPA) and Lake Linden Recreation Area (LLRA) of the Torch Lake Area of Concern (AOC). In addition to the FFS, the PA scope of work included contaminant source removal at the Mineral Building property located within the HPA to prevent further or renewed contamination of sediment in Torch Lake.

## 2.1 Site Description

The site occupies approximately 9.3 acres along the northwestern shoreline of Torch Lake at 52986 Highway M-26 in Torch Lake Township and it is currently owned by Silver Shore Enterprise LLC. (Silver Shore).

The surrounding property use is a mix of commercial and residential properties. The site is bordered by a chemical manufacturing facility operated by Koppers Performance Chemical to the southwest and residential and commercial properties to the northwest, across Highway M-26.

A chain link fence runs along the site boundaries. Currently two buildings are located on the site: the Mineral Building, a four-story tall concrete structure located along M26 near the northwest corner of the site, and a 30 by 40-foot single story sandstone building located approximately 150 feet east of the Mineral Building. Numerous waste piles were placed on the property, primarily between 1986 and 2010 as shown on Figure 2. It appears that the waste piles originated from various sources as noted below:

- Mining era waste
- Demolition debris, and waste associated with road work (gravel, asphalt, and concrete)
- The demolition of the stacks associated with the former smelter
- Peninsula Copper Industries (PCI) leased the property next door beginning in 1982 for recovery of copper from circuit boards to make copper sulfate as a fungicide for the wood preservative industry and to make other specialty copper compounds. As noted in the report, An Integrated Assessment of Torch Lake Area of Concern, "during its initial years, PCI produced fiberglass waste piles on adjacent property from electric circuit boards used to recover copper," (Urban et al., 2018).

## 2.2 Operations History

The Mineral Building was part of the former Calumet and Hecla (C&H) smelter facility and served for storage of feed material for the furnace. Operations began in 1929 and continued

until cessation in 1968. Originally, the feed material consisted of mined copper. From about 1943, the Mineral Building also received copper reclaimed from scrap materials for the war effort. Historical records show that during World War II and the Korean War, C&H, under contract with the U.S. Government "to perform war-related operations, processed scrap materials that were treated at the reclamation facility and/or smelting works" (Tidwell, 1948). Processed scrap material included insulated cables, scrap ammunition, automobiles, refrigerators and vacuum cleaner motors, radiators, transformers and generators. The scrap material was transported by ship and rail to the smelter and unloaded at the coal dock where it was sorted into different lots, and either ignited to burn off waste plastics and oils, leached in vats of ammonia at the leaching plant in Lake Linden, or sent directly to the Mineral Building prior to being treated in the smelter's furnaces.

The Mineral Building was also used for storage of by-product, e.g., copper oxide from ammonia leaching, copper oxychloride sulphate, fly ash, etc. The Mineral Building was in operation until 1968 when the smelting operations ceased, shortly after Universal Oil Products (UOP) acquisition of C&H. The smelter was demolished in the late 1970s. In 1982, UOP donated 75 acres (including the Mineral Building site) to Michigan Technological University (MTU). The stacks were demolished between 1993 and 1997 by the Keweenaw Development Corporation.

## 2.3 Regulatory History

The Mineral Building property was part of the overall Torch Lake Superfund site. Torch Lake was added to the National Priorities List (NPL) in 1986. The site was part of the Hubbell/Tamarack City area and was included in Operable Unit 1 (OU1). In 2000, the USEPA placed a vegetative soil cap on the strip of land starting at the Torch Lake shoreline and extending 170-feet onto the properties. The Hubbell/Tamarack City area was removed from the NPL in 2004 through a partial deletion.

Torch Lake was designated as an AOC in 1985 and currently has two remaining beneficial use impairments (BUIs) associated with restrictions on fish consumption and degradation of benthos. The fish consumption BUI is an advisory for polychlorinated biphenyls (PCBs) and mercury. The degradation of benthos BUI relates to low abundance and diversity.

## 2.4 Summary of Remedial Investigation Activities

Between 2014 and 2017, Michigan Department of Environment, Great Lakes, and Energy (EGLE) and USEPA completed various investigation activities and interim responses on the site. As part of those investigations, most of the waste piles were sampled and characterized.

Asbestos containing materials (ACM) and elevated concentrations of arsenic, copper, lead, other metals, cyanide, PCBs, and semi-volatile organic compounds were identified within the various debris piles.

Characterization sample results using the Toxicity Characteristic Leaching Procedure (TCLP) indicated some waste piles and some stack debris materials leached lead at concentrations considered characteristically hazardous.

In 2018, Honeywell completed additional sampling activities to refine characterization of the waste piles.

Based on the combined results of investigation activities completed by EGLE, USEPA, and Honeywell, it was estimated that 8,307 cubic yards (cyd) of waste material were located on the site. The waste material was categorized as follows:

- 2,293 cyd of soil and debris were impacted with non-hazardous levels of lead, and arsenic that included waste piles WP-01, WP-04, WP-06, WP-08, WP-09, WP-17, WP-20, WP-22, WP-23, WP-24, WP-29, WP-32, WP-45, and approximately 200 cubic yards of WP-48. Of these waste piles WP-06, WP-08, WP-17, WP-20, WP-22, WP-23, WP-24, WP-29 and a small portion of WP-48 also contained asbestos.
- 4,057 cyd were identified as characteristically hazardous for lead. This included waste piles WP-02, WP-05, WP-10, WP-18, WP-27, WP-28, stack debris, and approximately 831 cubic yards of WP-48. The stack debris accounted for an estimated 2,821 cubic yards of the material. Of these waste piles WP-02, WP-10, WP-18, WP-27 and WP-28 also contained asbestos.
- 1,957 cyd of material was either not regulated (Section 11504) or recyclable (Section 11505) under Part 115 of the Natural Resources and Environmental Protection Act (NREPA), Public Act 451 of 1994, as amended based on the material type, i.e., woody debris, concrete, asphalt, and scrap metal. Non-regulated material waste piles requiring appropriate handling and disposal and their contents (as identified in the 2018 Removal Assessment Report) were as follows:
    - WP-03 – Concrete slabs
    - WP-07 – Large concrete pieces (footers and base supports)
    - WP-12 – Asphalt and concrete
    - WP-13 – Sand and gravel with asphalt and concrete
    - WP-14 – Milled asphalt
    - WP-15 – Burnt wood, metal, and miscellaneous surface debris
    - WP-16 – Logs and wood timbers
    - WP-19 – Wood, stumps, and soil
    - WP-21 – Asphalt with at least one area of gravel, soil, and concrete
    - WP-25 – Concrete slabs
    - WP-26 – Asphalt pieces

- WP-30 – Gravel, soil, concrete, and asphalt pieces
- WP-31 – Soil with metal and wood pieces
- WP-33 – Limestone
- WP-46 – Concrete pieces

# 3.0 CONSTRUCTION ACTIVITIES

Construction activities were completed to remove onsite contaminant sources in accordance with the approved Remedial Action Work Plan, dated September 2019. The approved scope of work included the following activities:

- Surveying and marking the waste piles with paint and wooden stakes based on their defined waste stream: green for non-regulated, yellow for non-hazardous, red for characteristically hazardous, and blue/purple for ACM
- Removing solid pieces of concrete/debris, larger than 2-feet by 2-feet, from the waste pile(s); decontaminating debris on the decontamination pad; and staging as non-regulated waste.
- Direct-loading non-hazardous ACM waste piles into lined trucks for transportation and disposal at the K&W Landfill in Ontonagon, Michigan
- Segregating characteristically hazardous waste into smaller piles, i.e., approximately 400 cyd, for blending with EnviroBlend SP (EnviroBlend) at a rate of approximately 5 percent by weight to render the waste non-hazardous
- Sampling EnviroBlend treated waste for TCLP analysis to confirm that the treated waste meets the Resource Conservation and Recovery Act (RCRA) requirements for disposal as characteristic non-hazardous waste
- Staging and loading non-hazardous waste for transportation and disposal at the K&W Landfill in Ontonagon, Michigan
- Consolidating the non-regulated (concrete, clay pipe asphalt, woody debris, etc.) waste piles and placing along the retaining wall southwest of the Mineral Building.
- Site restoration

Construction activities were completed from October 1, 2019 through November 21, 2019 and July 6, 2020 through August 30, 2020. Photographs documenting the construction activities are presented in the Photographic Log in Appendix A. Supporting construction features are identified on Figure 3.

## 3.1 Project Team

Honeywell contracted Wood to design the remedy and manage construction activities. Wood subcontracted Ontario Specialty Contractor Inc (OSC) to complete construction activities.

## 3.2 Permits and Notification

A Soil Erosion and Sedimentation Control permit and a notification for handling ACM were required for completing source removal activities, as detailed below.

### 3.2.1 Soil Erosion and Sedimentation Control

Wood submitted a permit application pursuant to Part 91, Soil Erosion and Sedimentation Control (SESC), of Act 451 of the Public Acts of 1994, to the Houghton County Drain Commissioner. The SESC permit was issued on September 11, 2019.

### 3.2.2 Asbestos 10-Day Notification

A 10-Day Notification of Intent to Renovate/Demolish was submitted by OSC to EGLE on September 24, 2019.

A copy of the SESC permit and the Asbestos 10-Day notification form can be found in Appendix B.

## 3.3 Site Preparation

Site preparation activities included the following:

- Setting up office trailers at the site entrance on the northwest corner of the site
- Delivery of equipment, tools, and materials necessary to complete the work
- Use of Ground Penetrating Radar to complete utility clearance in area planned for excavation, i.e., WP-48
- Completing a topographic survey of the site and waste piles
- Implementing the SESC plan by installing silt fence and straw waddle around perimeter of work area
- Installing asbestos and lead hazard warning signs at the site entrance and perimeter of the site
- Demarcating the exclusion zones with Danger Asbestos and Lead tape and signage around the Stack Debris area, asbestos and/or lead containing waste piles and the staging/load out area
- Setting up decontamination areas for equipment and personnel
- Delineating waste piles using labeled wooden stakes, colored flagging and spray paint of different colors, as follows:
    - Green – nonregulated material
    - Blue/Purple –asbestos containing waste material
    - Yellow –non-hazardous waste material
    - Red – characterized hazardous waste material

- Constructing a loadout area on the northcentral portion of the site
- Constructing a haul road from the entrance at the northwest corner of the site to the loadout area. The haul road was constructed using 454 tons of 22A gravel and was approximately 6 inches thick.

## 3.4 Onsite Waste Management

Non-regulated waste piles were consolidated and stockpiled on the site, immediately west of the Mineral Building, as shown on Figure 3. Solid pieces of concrete/debris, larger than 2 feet by 2 feet were removed from non-hazardous waste piles and from the stack debris area and visually inspected for signs of contamination. If no visible signs of contamination were noted, the concrete/debris piece was decontaminated on the decontamination pad, and staged in the non-regulated waste area. If staining was noted, the concrete/debris piece was disposed with the soil from the pile it was associated with.

Waste piles that were identified as non-hazardous and non-asbestos containing were staged on plastic sheeting beside the constructed haul road. The staged material was then loaded into dump truck beds and transported to K&W Landfill for disposal. A total of 2,095.10 tons of non-hazardous material was transported and disposed.

Waste piles that were identified as non-hazardous asbestos containing were handled, staged, transported, and disposed separately from the non ACM. Workers, including the excavator operator, donned Level C personal protective equipment (PPE) during handling of the ACM. The staging area for ACM was located west adjacent to the non-asbestos material staging area, lined with plastic sheeting, and delineated with asbestos danger signage. The staged material was covered with plastic sheeting to avoid airborne asbestos fibers when it was not actively being handled. This material was loaded out into dump truck beds lined with plastic sheeting. The liner was sealed over the waste and "Asbestos Hazard" signage was attached to the plastic sheeting. The truck's tarp was lowered over the top of the plastic liner prior to the truck leaving the site. A total of 2,184.13 tons of non-hazardous ACM were transported and disposed at the K&W Landfill in Ontonagon, Michigan. Personal and perimeter air monitoring for asbestos and lead were completed as described in Section 3.5 of this report and personnel donned appropriate PPE any time asbestos and/or lead containing materials were handled or otherwise disturbed.

Soil stabilization was completed on waste piles that were identified as characteristically hazardous for lead. Soil stabilization was done on the ACM and non-ACM hazardous waste piles. Those waste piles were segregated into approximately 400 cyd piles and an excavator bucket was used to uniformly mix EnviroBlend with the waste material at a rate of approximately 5% by weight. During handling and treatment of the characteristically hazardous materials, workers, including the excavator operator donned Level C PPE. In addition, personal and perimeter air monitoring

were completed as described in Section 3.5 of this report. A composite sample was collected from each of the treated piles following a minimum waiting period of 14 hours after mixing with EnviroBlend. Each composite sample consisted of 4 to 6 grab samples, randomly collected from varying pile heights and depths. The composite samples were sent to SGS Galson for analysis of lead using the TCLP. The treated piles were covered with plastic sheeting to avoid moisture infiltration and dust generation while awaiting sampling and removal/disposal. All TCLP analytical results indicated that lead did not leach from the treated soils at or above the RCRA hazardous waste criterion. The TCLP sample analytical results are presented in Appendix C. Once the TCLP sampling results were received, the treated material was relocated to the non-hazardous staging area or the non-hazardous asbestos containing staging area, as appropriate. The material was disposed as either 1) non-hazardous amended with EnviroBlend or 2) asbestos containing non-hazardous amended with EnviroBlend. A total of 3,061.31 tons of non-hazardous amended with EnviroBlend material and 6,434.20 tons of asbestos containing non-hazardous with EnviroBlend material was transported and disposed at K&W Landfill.

A material with toothpaste like consistency and the color of copper patina was encountered within the bases of the stacks in the Stack Debris area. The material was sampled and analyzed and assumed to be hazardous based on the high concentration of lead. A total of 20.85 tons of hazardous waste was removed from the site and transported to US Ecology in Belville, Michigan for disposal.

Wet methods dust-suppression was implemented during handling and treatment of waste piles to avoid nuisance dust, and/or lead/asbestos fibers from becoming airborne. A water truck and portable pressure washer were available on site to use as needed, based on the dust monitoring results and/or visual observations. The portable pressure washer was fitted with a wand tip that would create a mist that was blown into the air immediately above any dust causing activity. Runoff water generated during dust suppression activities was collected and temporarily stored in a frac tank for later disposal.

Water collected in the decontamination pad pans was pumped into portable totes for disposal. Prior to disposal, the water was sampled per the requirements of the Portage Lake Water and Sewage Authority (PLWSA). On August 14, 2020, a total of 500 gallons of decontamination water was disposed at the PLWSA in Houghton, Michigan. A letter of acceptance signed by PLWSA representative is provided in Appendix D.

General site refuse generated during construction activities was collected, stored and subsequently disposed in a Waste Management (WM) roll off container. Recyclable materials, clean paper, cardboard and plastics, were collected and delivered to the local WM recycle center located in Houghton, Michigan.

## 3.5 Waste Transportation and Disposal

Wood completed waste profiles with assistance from WM for the four types of non-hazardous waste discussed above and worked with US Ecology to generate a profile for the hazardous waste.

Loading, transportation, and disposal began on October 17, 2019 and ended on November 21 due to winter weather. Wood and OSC remobilized to the site on July 6, 2020 to complete removal of remaining waste and site restoration.

The Table below summarizes total tons of various categories of wastes removed from the site:

| Waste Profile Number | Material | Shipped Tons Total |
|---|---|---|
| 125221MI | Non-Hazardous soil and debris | 2,095.10 |
| 125297MI | Non-Hazardous soil with EnviroBlend | 3,061.31 |
| ASB125226MI | Non-Hazardous soil with ACM | 2,184.13 |
| ASB125235MI | Non-Hazardous soil with EnviroBlend and ACM | 6,434.20 |
| US Ecology* | Characteristically Hazardous Waste | 20.85 |

*The hazardous waste profile was not given a number; the USEPA site ID was used for transportation and disposal.

The transportation and disposal waste manifests and landfill weigh tickets are provided in Appendix D.

## 3.6 Perimeter and Personal Air Monitoring

Perimeter air monitoring included asbestos, lead and total dust. Total dust monitoring was completed using real time particulate/aerosol monitors to inform workers in real time of potential nuisance dust and lead. Personal air monitoring was completed for the Wood crew member that was closest to the potential dust-causing activities and included asbestos, lead, and real time dust.

Perimeter and personal air monitoring were completed during construction activities that had the potential to disturb asbestos and/or lead containing waste pile materials and/or the Stack Debris material. Exceptions were made during days with precipitation when potential risk for airborne material was mitigated due to the moisture that would keep asbestos fibers and dust down.

Additionally, during days with precipitation the sampling monitoring equipment would get wet and unreadable.

Wood collected daily perimeter air samples during site activities involving handling of contaminated material at six different station locations, as shown on Figure 3. Four of the six station locations were selected based on wind direction, as follows: one sampling station (sample 3) was placed upwind, one sampling station (sample 1) was placed downwind, and two sampling stations (2, 4) in each of the crosswind directions. Two additional sampling stations (5, 6) were placed in close proximity to the site, near offsite receptors: the neighboring Koppers facility and residential properties across M-26.

For the first two weeks, personal air monitoring samples for asbestos were analyzed using NIOSH Method 7400, phase contrast microscopy (PCM). Beginning the third week, personal air samples were analyzed with the perimeter air samples following NIOSH Method 7402 using transmission electron microscopy (TEM) to quantify asbestos fibers on the sampling filters. TEM results were compared to the permissible exposure limit (PEL) for asbestos of 0.1 fiber per cubic centimeter (f/cc) and the site action limit of 0.01 f/cc. None of the air sampling monitoring results exceeded the PEL or the site action limit.

Air samples for lead were analyzed using the NIOSH Method 7303 Inductively Coupled Plasma and compared to the PEL of 50 µg/$m^3$ and the site action limit of 12.1 µg/$m^3$. Lead was not detected in the air samples during the site remediation activities.

Direct-read particulate/aerosol measurements did not exceed the site action limit of 0.09 milligrams per cubic meter above the background measurement. At any time, the particulate measurements began to rise the contractor was asked to use the portable pressure washer to spray water in the work area to mitigate any dust.

Perimeter air monitoring results and personal air monitoring results are presented in Table 2. Laboratory analytical results are presented in Appendix C.

## 3.7 Site Restoration

Site restoration activities were completed following removal and disposal of the waste piles in accordance with the approved grading plan. Site restoration activities consisted of the following:

- Removal of temporary facilities, including the lay-down area, decontamination pad, staging areas, and the haul road.
- Installation of an orange demarcation fabric of GEOTEX® 601 to differentiate between the existing soil and the clean cover material. The fabric was rolled out and overlapped to cover the entire site.

- Placement and compaction of general fill sand over the demarcation fabric. The sand was used to shape the perimeter berms and promote positive drainage to the northeast corner of the site with a thickness range of 0.5 feet to 3 feet.
- Construction of a riprap swale near the northeast corner of the site to capture site runoff and direct the flow to the existing drainage ditch located north of the site. The swale was constructed one foot deeper than the final grade, lined with a non-woven geotextile and covered with riprap.
- Placement, compaction, and final grading of a minimum 6 inches of 22A gravel over the general fill sand. The 22A gravel thickness quality control verification is presented as Figure 4 and discussed in Section 5.

# 4.0 CHRONOLOGY OF EVENTS

The chronology of source removal events including pre-construction activities and construction activities, is presented below.

## 4.1 Pre-Construction Activities

| ***2019 Pre-Construction Activities*** | |
|---|---|
| August 20 | Honeywell and USEPA GLNPO signed Project Agreement |
| September 18 | Submit Finalized Remedial Action Work Plan (RAWP) and HASP |
| September 26 | Received approval from USEPA on the RAWP and HASP |
| September 30 | Finalized contractor procurement 2020 |
| ***2020 Pre-Construction Activities*** | |
| March 26 | Final Grading Plan approved by stakeholders |

## 4.2 Construction Activities

| ***2019 Construction Activities*** | |
|---|---|
| October 1 | Mobilized to the site |
| October 3 | Installed SESCs |
| October 10 | Constructed decontamination pads |
| October 11 | Constructed haul roads and staging areas |
| October 11 | Delineated waste piles and exclusion zones |
| October 11 | Begin relocation of non-regulated material |
| October 14 | Begin staging non-hazardous waste piles |
| October 16 | Begin treating hazardous waste piles with EnviroBlend |
| October 16 | Begin staging non-hazardous soil with asbestos |
| October 17 | Begin waste material transportation for disposal at K&W Landfill |
| October 23 | Completed transportation and disposal of non-hazardous material |
| October 28 | Completed transportation and disposal of asbestos, non-hazardous material |
| November 1 | Completed treating hazardous waste piles with EnviroBlend |
| November 14 | Completed transportation and disposal of non-hazardous material with EnviroBlend |
| November 20 | Completed transportation and disposal of asbestos, non-hazardous material with EnviroBlend |
| November 21 | Demobilized from the site for the winter |

| ***2020 Construction Activities*** | |
|---|---|
| July 6 | Re-mobilized to the site |
| July 8 | Completed topographic survey of the site without waste piles |
| July 9 | Set up exclusion zone around the Stack Debris area and decontamination |

| ***2020 Construction Activities*** | |
|---|---|
| | area and started removal of remaining debris |
| July 15 | Begin placement of demarcation fabric |
| July 15 | Begin placement of general fill |
| July 20 | Removal and disposal of 20.85 tons of hazardous material from the stack base |
| July 30 | Begin placement of 22A gravel final cover |
| August 6 | Begin placement of riprap swale |
| August 12 | Completed placement of general fill |
| August 14 | Disposed 500 gallons of filtered decontamination water at PLWSA |
| August 18 | Completed construction of the riprap swale |
| August 20 | Completed placement of 22A gravel |

# 5.0 CONSTRUCTION QUALITY ASSURANCE/QUALITY CONTROL

Wood completed quality assurance and quality control throughout the construction as outlined below.

## 5.1 Surveys

Topographical surveys were completed throughout the construction progression. A preconstruction survey was completed that included the waste piles and Stack Debris area, to document existing site conditions. A second survey was completed in October 2019, to collect data necessary for preparation of a Grading Plan. A third site survey was completed in July 2020 after removal of the waste piles.

A Global Positioning System (GPS) surface of the final elevation was prepared by Wood and supplied to the Subcontractor prior to restoration activities. This GPS surface was used to grade the site to the Grading Plan requirements.

A final topographic survey was completed upon restoration activities to verify that the final grade met the intentions of the Grading Plan. The resulting elevation contours for the final survey are presented on Figure 5**.**

## 5.2 Fill, Gravel, and Riprap

The general fill was Class II sand taken from a virgin source, Wuebben Pit located in Dollar Bay, Michigan. A total of 1,134.88 tons general fill sand material was brought on site to backfill the WP-48 excavation to the original grade. The Wuebben Pit source of Class II sand was tested for potential contaminants and found to be unimpacted.

A total of 17,459.79 tons of general fill sand was imported to place over the geotextile demarcation fabric for site restoration. A single truckload of sand for this purpose was delivered from Elbow Pit located in Calumet, Michigan.

A total of 9,227.34 tons of 22A gravel was imported for construction of the final cover. The 22A gravel was engineered in and delivered from Elbow Pit located in Calumet, Michigan.

In addition to the sand and gravel, a total of 293.41 tons of riprap was delivered to the site to armor slopes that were greater than 3 to 1. The riprap was engineered in and delivered from Elbow Pit located in Calumet, Michigan.

The Class II sands, 22A aggregate and riprap were required to be Michigan Department of Transportation approved. The sample analytical results and "virgin source" letters are included in Appendix E. Copies of the imported fill weight tickets are also provided in Appendix E.

## 5.3 Geotextile

An orange demarcation layer consisting of a non-woven geotextile fabric was placed over the soil surface prior to other site restoration activities. The selected geotextile for this application was GEOTEX® 601 DND, a high-visibility orange polypropylene, staple fiber, needle-punched nonwoven geotextile by Propex. The DND designation indicates that the fabric was labeled in 24-inch intervals with DANGER DO NOT DIG and PELIGRO NO EXCAVAR.

In addition to the demarcation fabric a non-woven geotextile fabric was selected to be placed on slopes greater than 3 to 1 with riprap placed over the fabric. GEOTEX® 801 a polypropylene, staple fiber, needle-punched nonwoven geotextile by Propex was chosen for this application.

Copies of the geotextile product data sheets are provided in Appendix F.

## 5.4 Grading

The Grading Plan required general fill sand over the demarcation fabric and 22A gravel over the sand. The gravel was obtained from Elbow Pit located in Calumet, Michigan. The 22A gravel was engineered from crushed mine rock with an addition of the appropriate fines using local sand also obtained from Elbow Pit.

## 5.5 Site Grading Verification

The site grading was designed to allow proper drainage of stormwater runoff. Imported soil and gravel was graded to create 0.5%-1% slope to direct storm water flow toward the constructed ditch/swale located in the northeast corner of the site and ultimately to the drain located immediately north of the site.

The Grading Plan required 6 inches of 22A gravel cover across the entire site; with the exception of areas with slopes greater than 3 to 1. These areas were covered with non-woven geotextile and 1-foot-thick riprap.

Following placement, grading and compaction, a planting hoe was used to dig at various locations across the site to verify the thickness and confirm that a minimum of 6 inches of 22A gravel had been placed. The survey points and results are illustrated on Figure 4.

A final site survey was completed to verify that grade elevations meet the requirement of the Grading Plan. The final site survey elevation contours are presented on Figure 5.

# 6.0 SUSTAINABILITY

This section discusses sustainable methods implemented throughout the construction project.

## 6.1 Local Economic Impact

Wood and OSC employed a number of local companies to provide supporting services during construction activities. The use of local labor and materials contributed to the goal of having a positive economic impact on the local population. The following local companies were hired to support construction activities:

- Upper Peninsula Abatement LLC, a local business specializing in asbestos abatement, provided 3 to 4 workers for more than a month for work related to handling of ACM.
- SmartCreative, a local commercial drone service was contracted to capture aerial photography and document progress of construction activities.
- Local truckers were used to transport materials to the landfill and bring fill material back onto the site.
- Local aggregate pits supplied the general fill sand and 22A gravel to the site.
- The site was returned to a usable property increasing the likelihood to bring jobs and money to the local area.
- In addition, Wood and OSC personnel stayed in local accommodations and purchased meals and sundries from local businesses.

## 6.2 Reuse/Recycling of Onsite Materials

Pieces of unstained concrete larger than 2 feet by 2 feet were decontaminated with a power washer and then placed in the non-regulated material consolidation pile located south of the Mineral Building.

General refuse made of recyclable materials (cardboard boxes, aluminum or steel cans, plastic containers, etc.) were collected on site and dropped off at the local recycling center located in Houghton MI.

# 7.0 SOIL EROSION AND SEDIMENTATION CONTROL INSPECTIONS

On October 8, 2020, EGLE conducted a site inspection and observed erosion of the cover system near the riprap swale in the east corner of the site. On October 13, 2020, Silver Shore completed repair work by adding fabric along the eroded soil areas and re-grading the riprap.

EGLE conducted a follow up inspection on October 20, 2020, and observed erosion of the cover system along the east side of the site, adjacent to USEPA cap. It was noted that eroded soil had entered the ditch. On October 29, 2020, Silver Shore added riprap in the eroded areas and removed the sediment from the ditch.

Photographs of the erosion and the erosion repairs are presented in Appendix A. The locations of the repairs are presented on Figure 5.

# 8.0 SOIL COVER MONITORING AND MAINTENANCE

The soil cover must remain intact to function as designed. Periodic cover monitoring should be completed to evaluate potential for failure and if corrective actions are required as outlined in the Monitoring and Maintenance Plan provided in Appendix G.

# 9.0 REFERENCES

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The Mannik & Smith Group, Inc., 2017, Interim Response Construction Summary Report for Asbestos Containing Building Material Abatement. Abandoned Mining Wastes – Torch Lake Non-Superfund

Site, CHLL Hubbell Processing Area, Houghton County, Michigan, Site ID# 31000098. Prepared for the Michigan Department of Environmental Quality, April 2017.

## TABLES

TABLE 1
Enviroblend Soil Sample TCLP Results
Contaminant Source Material Removal
Torch Lake Area of Concern
Houghton County, Michigan

| Analyte | | | Arsenic | Lead |
|---|---|---|---|---|
| | Units | Sample | RCRA Criteria (TCLP) | |
| | mg/L | Date | *5.0* | *5.0* |
| Sample ID | | | | |
| CHMB02-SS01-0000-WP10-1017 | mg/L | 10/17/2019 | 0.98 | <0.5 |
| CHMB02-SS02-0000-WP18-1017 | mg/L | 10/17/2019 | <0.5 | <0.5 |
| CHMB02-CS03-WP48-1022 | mg/L | 10/22/2019 | <0.5 | <0.5 |
| CHMB02-CS04-WP48-1022 | mg/L | 10/22/2019 | <0.5 | <0.5 |
| CHMB02-CS05-WP23-1023 | mg/L | 10/23/2019 | - | <0.5 |
| CHMB02-CS06-WP48-1023 | mg/L | 10/23/2019 | - | <0.5 |
| CHMB02-CS07-WP48-1028 | mg/L | 10/28/2019 | <0.5 | <0.5 |
| CHMB02-CS08-WP48-1028 | mg/L | 10/28/2019 | <0.5 | <0.5 |
| CHMB02-CS09-WP48-1028* | mg/L | 10/28/2019 | - | - |
| CHMB02-CS10-WP05-1028 | mg/L | 10/28/2019 | <0.5 | <0.5 |
| CHMB02-CS11-WP02-1028 | mg/L | 10/28/2019 | <0.5 | <0.5 |
| CHMB02-CS12-WP48-1029 | mg/L | 10/29/2019 | <0.5 | <0.5 |
| CHMB02-CS13-WP27-1030 | mg/L | 10/30/2019 | <0.5 | <0.5 |
| CHMB02-CS14-WP28-1030 | mg/L | 10/30/2019 | <0.5 | <0.5 |
| CHMB02-CS15-Stack01-1030 | mg/L | 10/30/2019 | <0.5 | <0.5 |
| CHMB02-CS16-Stack02-1031 | mg/L | 10/31/2019 | <0.5 | <0.5 |
| CHMB02-CS17-Stack03-1031 | mg/L | 10/31/2019 | <0.5 | <0.5 |
| CHMB02-CS18-Stack04-1031 | mg/L | 10/31/2019 | <0.5 | <0.5 |
| CHMB02-CS19-Stack05-1031 | mg/L | 10/31/2019 | <0.5 | <0.5 |
| CHMB02-CS20-Stack06-1101 | mg/L | 11/1/2019 | <0.5 | <0.5 |
| CHMB02-CS21-Stack07-1101 | mg/L | 11/1/2019 | <0.5 | <0.5 |
| CHMB02-CS22-Stack08-1107 | mg/L | 11/7/2019 | <0.5 | <0.5 |
| CHMB02-CS23-Stack09-1111 | mg/L | 11/11/2019 | <0.5 | 0.93 |
| CHMB02-CS24-Stack10-1111 | mg/L | 11/11/2019 | <0.5 | <0.5 |
| CHMB02-CS25-Stack11-1111 | mg/L | 11/11/2019 | <0.5 | <0.5 |
| CHMB02-CS26-Stack12-0717 | mg/L | 7/17/2020 | <0.5 | <0.5 |

Notes:
<0.5 - less than the method detection limit.
*Sample collected too early, resampled 10/29 as CHMB02-CS12-WP48-1029.
RCRA - Resource Conservation and Recovery Act
TCLP - Toxic characteristic leaching procedure.

Created by: LS 0901209
Checked by: KC 090220

TABLE 2
Perimeter and Personal Air Monitoring Results
Week of 10/07/2019
Torch Lake Area of Concern - Mineral Building
Houghton County, MI

| Date | Sample ID | Sample Location | Asbestos Concentration (f/cc) (TEM analysis) | Action Limit (f/cc) | Lead Concentration ($ug/m^3$) | Action Limit ($ug/m^3$) | Notes |
|---|---|---|---|---|---|---|---|
| 10/7/2019 | -- | Sta. 01 | -- | 0.01 | -- | 12.1 | No air monitoring - no earth moving activities |
| 10/7/2019 | -- | Sta. 02 | -- | 0.01 | -- | 12.1 | |
| 10/7/2019 | -- | Sta. 03 | -- | 0.01 | -- | 12.1 | |
| 10/7/2019 | -- | Sta. 04 | -- | 0.01 | -- | 12.1 | |
| 10/7/2019 | -- | Sta. Koppers | -- | 0.01 | -- | 12.1 | |
| 10/7/2019 | -- | Sta. Residence | -- | 0.01 | -- | 12.1 | |
| 10/7/2019 | -- | Personal | -- | 0.01 | -- | 12.1 | |
| 10/7/2019 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 10/7/2019 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 10/7/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | |
| 10/7/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | |
| | | | | | | | |
| 10/8/2019 | -- | Sta. 01 | -- | 0.01 | -- | 12.1 | No air monitoring - no earth moving activities |
| 10/8/2019 | -- | Sta. 02 | -- | 0.01 | -- | 12.1 | |
| 10/8/2019 | -- | Sta. 03 | -- | 0.01 | -- | 12.1 | |
| 10/8/2019 | -- | Sta. 04 | -- | 0.01 | -- | 12.1 | |
| 10/8/2019 | -- | Sta. Koppers | -- | 0.01 | -- | 12.1 | |
| 10/8/2019 | -- | Sta. Residence | -- | 0.01 | -- | 12.1 | |
| 10/8/2019 | -- | Personal | -- | 0.01 | -- | 12.1 | |
| 10/8/2019 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 10/8/2019 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 10/8/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | |
| 10/8/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | |
| | | | | | | | |
| 10/9/2019 | -- | Sta. 01 | -- | 0.01 | -- | 12.1 | No air monitoring - no earth moving activities |
| 10/9/2019 | -- | Sta. 02 | -- | 0.01 | -- | 12.1 | |
| 10/9/2019 | -- | Sta. 03 | -- | 0.01 | -- | 12.1 | |
| 10/9/2019 | -- | Sta. 04 | -- | 0.01 | -- | 12.1 | |
| 10/9/2019 | -- | Sta. Koppers | -- | 0.01 | -- | 12.1 | |
| 10/9/2019 | -- | Sta. Residence | -- | 0.01 | -- | 12.1 | |
| 10/9/2019 | -- | Personal | -- | 0.01 | -- | 12.1 | |
| 10/9/2019 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 10/9/2019 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 10/9/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | |
| 10/9/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | |
| | | | | | | | |
| 10/10/2019 | CHMB02-AB01-1010 | Sta. 01 | <0.0028 | 0.01 | <0.38 | 12.1 | |
| 10/10/2019 | CHMB02-AB02-1010 | Sta. 02 | <0.0029 | 0.01 | <0.39 | 12.1 | |
| 10/10/2019 | CHMB02-AB03-1010 | Sta. 03 | <0.0035 | 0.01 | <0.41 | 12.1 | |
| 10/10/2019 | CHMB02-AB04-1010 | Sta. 04 | <0.0035 | 0.01 | <0.42 | 12.1 | |
| 10/10/2019 | CHMB02-AB05-1010 | Sta. Koppers | <0.0031 | 0.01 | <0.42 | 12.1 | |
| 10/10/2019 | CHMB02-AB06-1010 | Sta. Residence | <0.0034 | 0.01 | <0.45 | 12.1 | |
| 10/10/2019 | CHMB02-PM-LJS-1010 | Personal | 0.010 | 0.01 | <0.40 | 12.1 | Asbestos Fiber Count conducted with PCM method |
| 10/10/2019 | -- | Field Blank (open) | -- | NA | -- | NA | Did not collect blanks |
| 10/10/2019 | -- | Field Blank (open) | -- | NA | -- | NA | Did not collect blanks |
| 10/10/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | Did not collect blanks |
| 10/10/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | Did not collect blanks |
| | | | | | | | |
| 10/11/2019 | CHMB02-AB01-1011 | Sta. 01 | <0.004 | 0.01 | <0.52 | 12.1 | |
| 10/11/2019 | CHMB02-AB02-1011 | Sta. 02 | <0.0039 | 0.01 | <0.55 | 12.1 | |
| 10/11/2019 | CHMB02-AB03-1011 | Sta. 03 | <0.0042 | 0.01 | <0.52 | 12.1 | |
| 10/11/2019 | CHMB02-AB04-1011 | Sta. 04 | <0.0036 | 0.01 | <0.50 | 12.1 | |
| 10/11/2019 | CHMB02-AB05-1011 | Sta. Koppers | <0.0039 | 0.01 | <0.53 | 12.1 | |
| 10/11/2019 | CHMB02-AB06-1011 | Sta. Residence | <0.0039 | 0.01 | <0.52 | 12.1 | |
| 10/11/2019 | CHMB02-PM-KLC-1011 | Personal | 0.005 | 0.01 | <0.45 | 12.1 | Asbestos Fiber Count conducted with PCM method |
| 10/11/2019 | CHMB02-AB-1011-FBO | Field Blank (open) | ND | NA | -- | NA | |
| 10/11/2019 | -- | Field Blank (open) | -- | NA | -- | NA | Did not collect open blank. |
| 10/11/2019 | CHMB02-AB-1011-FBC | Field Blank (closed) | -- | NA | -- | NA | |
| 10/11/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | Did not collect open blank. |
| | | | | | | | |
| 10/12/2019 | -- | Sta. 01 | -- | 0.01 | -- | 12.1 | No air monitoring - no earth moving activities |
| 10/12/2019 | -- | Sta. 02 | -- | 0.01 | -- | 12.1 | |
| 10/12/2019 | -- | Sta. 03 | -- | 0.01 | -- | 12.1 | |
| 10/12/2019 | -- | Sta. 04 | -- | 0.01 | -- | 12.1 | |
| 10/12/2019 | -- | Sta. Koppers | -- | 0.01 | -- | 12.1 | |
| 10/12/2019 | -- | Sta. Residence | -- | 0.01 | -- | 12.1 | |
| 10/12/2019 | -- | Personal | -- | 0.01 | -- | 12.1 | |
| 10/10/2019 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 10/10/2019 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 10/10/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | |
| 10/10/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | |

Notes:
f/cc = fibers per cubic centimeter
NA = Not analyzed or not applicable
ND = No fibers were detected in the field blank
PCM = Phase contrast microscopy
TEM = Transmission electron microscopy
$ug/m^3$ = microgram per cubic meter

TABLE 2
Perimeter and Personal Air Monitoring Results
Week of 10/14/2019
Torch Lake Area of Concern - Mineral Building
Houghton County, MI

| Date | Sample ID | Sample Location | Asbestos Concentration (f/cc) (TEM analysis) | Action Limit (f/cc) | Lead Concentration ($ug/m^3$) | Action Limit ($ug/m^3$) | Notes |
|---|---|---|---|---|---|---|---|
| 10/14/2019 | CHMB02-AB01-1014 | Sta. 01 | <0.0026 | 0.01 | <0.36 | 12.1 | |
| 10/14/2019 | CHMB02-AB02-1014 | Sta. 02 | <0.0026 | 0.01 | <0.36 | 12.1 | |
| 10/14/2019 | CHMB02-AB03-1014 | Sta. 03 | <0.0026 | 0.01 | <0.37 | 12.1 | |
| 10/14/2019 | CHMB02-AB04-1014 | Sta. 04 | <0.0026 | 0.01 | <0.34 | 12.1 | |
| 10/14/2019 | CHMB02-AB05-1014 | Sta. Koppers | <0.0038 | 0.01 | <0.34 | 12.1 | |
| 10/14/2019 | CHMB02-AB06-1014 | Sta. Residence | <0.0026 | 0.01 | <0.34 | 12.1 | |
| 10/14/2019 | CHMB02-PM-LJS-1014 | Personal | 0.014 | 0.01 | <0.36 | 12.1 | Asbestos Fiber Count conducted with PCM method |
| 10/14/2019 | -- | Field Blank (open) | -- | NA | -- | NA | Did not collect blanks |
| 10/14/2019 | -- | Field Blank (open) | -- | NA | -- | NA | Did not collect blanks |
| 10/14/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | Did not collect blanks |
| 10/14/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | Did not collect blanks |
| | | | | | | | |
| 10/15/2019 | CHMB02-AB01-1015 | Sta. 01 | <0.0028 | 0.01 | <0.36 | 12.1 | |
| 10/15/2019 | CHMB02-AB02-1015 | Sta. 02 | <0.0028 | 0.01 | <0.36 | 12.1 | |
| 10/15/2019 | CHMB02-AB03-1015 | Sta. 03 | <0.0026 | 0.01 | <0.34 | 12.1 | |
| 10/15/2019 | CHMB02-AB04-1015 | Sta. 04 | <0.0029 | 0.01 | <0.34 | 12.1 | |
| 10/15/2019 | CHMB02-AB05-1015 | Sta. Koppers | <0.0028 | 0.01 | <0.35 | 12.1 | Two non-asbestos structure detected. |
| 10/15/2019 | CHMB02-AB06-1015 | Sta. Residence | <0.0028 | 0.01 | <0.35 | 12.1 | |
| 10/15/2019 | CHMB02-PM-KLC-1015 | Personal | 0.012 | 0.01 | <0.36 | 12.1 | Asbestos Fiber Count conducted with PCM method |
| 10/15/2019 | -- | Field Blank (open) | -- | NA | -- | NA | Did not collect blanks |
| 10/15/2019 | -- | Field Blank (open) | -- | NA | -- | NA | Did not collect blanks |
| 10/15/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | Did not collect blanks |
| 10/15/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | Did not collect blanks |
| | | | | | | | |
| 10/16/2019 | CHMB02-AB01-1016 | Sta. 01 | <0.0029 | 0.01 | <0.34 | 12.1 | |
| 10/16/2019 | CHMB02-AB02-1016 | Sta. 02 | <0.0028 | 0.01 | <0.34 | 12.1 | One non-asbestos structure detected. |
| 10/16/2019 | CHMB02-AB03-1016 | Sta. 03 | <0.0027 | 0.01 | <0.34 | 12.1 | |
| 10/16/2019 | CHMB02-AB04-1016 | Sta. 04 | <0.0028 | 0.01 | <0.34 | 12.1 | |
| 10/16/2019 | CHMB02-AB05-1016 | Sta. Koppers | <0.0025 | 0.01 | <0.34 | 12.1 | |
| 10/16/2019 | CHMB02-AB06-1016 | Sta. Residence | <0.0028 | 0.01 | <0.36 | 12.1 | |
| 10/16/2019 | CHMB02-PM-LJS-1016 | Personal | 0.02 | 0.01 | <0.37 | 12.1 | Asbestos Fiber Count conducted with PCM method |
| 10/16/2019 | -- | Field Blank (open) | -- | NA | -- | NA | Did not collect blanks |
| 10/16/2019 | -- | Field Blank (open) | -- | NA | -- | NA | Did not collect blanks |
| 10/16/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | Did not collect blanks |
| 10/16/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | Did not collect blanks |
| | | | | | | | |
| 10/17/2019 | CHMB02-AB01-1017 | Sta. 01 | <0.0037 | 0.01 | <0.43 | 12.1 | |
| 10/17/2019 | CHMB02-AB02-1017 | Sta. 02 | <0.0034 | 0.01 | <0.42 | 12.1 | |
| 10/17/2019 | CHMB02-AB03-1017 | Sta. 03 | <0.0036 | 0.01 | <0.39 | 12.1 | |
| 10/17/2019 | CHMB02-AB04-1017 | Sta. 04 | <0.0031 | 0.01 | <0.40 | 12.1 | |
| 10/17/2019 | CHMB02-AB05-1017 | Sta. Koppers | <0.0034 | 0.01 | <0.43 | 12.1 | |
| 10/17/2019 | CHMB02-AB06-1017 | Sta. Residence | <0.0036 | 0.01 | <0.44 | 12.1 | |
| 10/17/2019 | CHMB02-PM-KLC-1017 | Personal | 0.009 | 0.01 | <0.46 | 12.1 | Asbestos Fiber Count conducted with PCM method |
| 10/17/2019 | CHMB02-PM-1017-FBO | Field Blank (open) | ND | NA | -- | NA | Asbestos Fiber Count conducted with PCM method |
| 10/17/2019 | CHMB02-PM02-1017-FBO | Field Blank (open) | -- | NA | ND | NA | |
| 10/17/2019 | CHMB02-AB-1017-FBC | Field Blank (closed) | ND | NA | -- | NA | |
| 10/17/2019 | CHMB02-PM02-1017-FBC | Field Blank (closed) | -- | NA | ND | NA | |
| | | | | | | | |
| 10/18/2019 | -- | Sta. 01 | -- | 0.01 | -- | 12.1 | No air monitoring - three week rotation, no work. |
| 10/18/2019 | -- | Sta. 02 | -- | 0.01 | -- | 12.1 | |
| 10/18/2019 | -- | Sta. 03 | -- | 0.01 | -- | 12.1 | |
| 10/18/2019 | -- | Sta. 04 | -- | 0.01 | -- | 12.1 | |
| 10/18/2019 | -- | Sta. Koppers | -- | 0.01 | -- | 12.1 | |
| 10/18/2019 | -- | Sta. Residence | -- | 0.01 | -- | 12.1 | |
| 10/18/2019 | -- | Personal | -- | 0.01 | -- | 12.1 | |
| 10/18/2019 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 10/18/2019 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 10/18/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | |
| 10/18/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | |
| | | | | | | | |
| 10/19/2019 | -- | Sta. 01 | -- | 0.01 | -- | 12.1 | No air monitoring - three week rotation, no work. |
| 10/19/2019 | -- | Sta. 02 | -- | 0.01 | -- | 12.1 | |
| 10/19/2019 | -- | Sta. 03 | -- | 0.01 | -- | 12.1 | |
| 10/19/2019 | -- | Sta. 04 | -- | 0.01 | -- | 12.1 | |
| 10/19/2019 | -- | Sta. Koppers | -- | 0.01 | -- | 12.1 | |
| 10/19/2019 | -- | Sta. Residence | -- | 0.01 | -- | 12.1 | |
| 10/19/2019 | -- | Personal | -- | 0.01 | -- | 12.1 | |
| 10/18/2019 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 10/18/2019 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 10/18/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | |
| 10/18/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | |

Notes:
f/cc = fibers per cubic centimeter
NA = Not analyzed or not applicable
ND = No fibers were detected in the field blank
PCM = Phase contrast microscopy
TEM = Transmission electron microscopy
$ug/m^3$ = microgram per cubic meter

Created by: LS_120319
Checked by: KC 120419

TABLE 2
Perimeter and Personal Air Monitoring Results
Week of 10/21/2019
Torch Lake Area of Concern - Mineral Building
Houghton County, MI

| Date | Sample ID | Sample Location | Asbestos Concentration (f/cc) (TEM analysis) | Action Limit (f/cc) | Lead Concentration ($ug/m^3$) | Action Limit ($ug/m^3$) | Notes |
|---|---|---|---|---|---|---|---|
| 10/21/2019 | -- | Sta. 01 | -- | 0.01 | -- | 12.1 | |
| 10/21/2019 | -- | Sta. 02 | -- | 0.01 | -- | 12.1 | |
| 10/21/2019 | -- | Sta. 03 | -- | 0.01 | -- | 12.1 | |
| 10/21/2019 | -- | Sta. 04 | -- | 0.01 | -- | 12.1 | |
| 10/21/2019 | -- | Sta. Koppers | -- | 0.01 | -- | 12.1 | |
| 10/21/2019 | -- | Sta. Residence | -- | 0.01 | -- | 12.1 | No air monitoring - rain. |
| 10/21/2019 | -- | Personal | -- | 0.01 | -- | 12.1 | |
| 10/21/2019 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 10/21/2019 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 10/21/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | |
| 10/21/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | |
| | | | | | | | |
| 10/22/2019 | CHMB02-AB01-1022 | Sta. 01 | <0.0054 | 0.01 | <0.71 | 12.1 | |
| 10/22/2019 | CHMB02-AB02-1022 | Sta. 02 | <0.0056 | 0.01 | <0.72 | 12.1 | |
| 10/22/2019 | CHMB02-AB03-1022 | Sta. 03 | <0.0058 | 0.01 | <0.73 | 12.1 | |
| 10/22/2019 | CHMB02-AB04-1022 | Sta. 04 | <0.0055 | 0.01 | <0.89 | 12.1 | |
| 10/22/2019 | CHMB02-AB05-1022 | Sta. Koppers | <0.0059 | 0.01 | <0.73 | 12.1 | |
| 10/22/2019 | CHMB02-AB06-1022 | Sta. Residence | <0.0054 | 0.01 | <0.77 | 12.1 | |
| 10/22/2019 | CHMB02-PM-LJS-1022 | Personal | <0.0062 | 0.01 | <0.84 | 12.1 | One non-asbestos structure detected. |
| 10/22/2019 | CHMB02-AB-1022-FBO1 | Field Blank (open) | -- | NA | NA | NA | |
| 10/22/2019 | CHMB02-AB-1022-FBC2 | Field Blank (closed) | -- | NA | NA | NA | |
| 10/22/2019 | CHMB02-AB-1022-FBO3 | Field Blank (open) | ND | NA | -- | NA | |
| 10/22/2019 | CHMB02-AB-1022-FBC4 | Field Blank (closed) | ND | NA | -- | NA | |
| | | | | | | | |
| 10/23/2019 | -- | Sta. 01 | -- | 0.01 | -- | 12.1 | |
| 10/23/2019 | -- | Sta. 02 | -- | 0.01 | -- | 12.1 | |
| 10/23/2019 | -- | Sta. 03 | -- | 0.01 | -- | 12.1 | |
| 10/23/2019 | -- | Sta. 04 | -- | 0.01 | -- | 12.1 | |
| 10/23/2019 | -- | Sta. Koppers | -- | 0.01 | -- | 12.1 | |
| 10/23/2019 | -- | Sta. Residence | -- | 0.01 | -- | 12.1 | No air monitoring - rain. |
| 10/23/2019 | -- | Personal | -- | 0.01 | -- | 12.1 | |
| 10/23/2019 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 10/23/2019 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 10/23/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | |
| 10/23/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | |
| | | | | | | | |
| 10/24/2019 | CHMB02-AB01-1024 | Sta. 01 | <0.0043 | 0.01 | <0.53 | 12.1 | |
| 10/24/2019 | CHMB02-AB02-1024 | Sta. 02 | <0.0042 | 0.01 | <0.54 | 12.1 | |
| 10/24/2019 | CHMB02-AB03-1024 | Sta. 03 | <0.0042 | 0.01 | <0.50 | 12.1 | |
| 10/24/2019 | CHMB02-AB04-1024 | Sta. 04 | <0.0035 | 0.01 | <0.48 | 12.1 | |
| 10/24/2019 | CHMB02-AB05-1024 | Sta. Koppers | <0.0038 | 0.01 | <0.49 | 12.1 | |
| 10/24/2019 | CHMB02-AB06-1024 | Sta. Residence | <0.0034 | 0.01 | <0.46 | 12.1 | |
| 10/24/2019 | CHMB02-PM-LJS-1024 | Personal | <0.0036 | 0.01 | <0.49 | 12.1 | |
| 10/24/2019 | CHMB02-PM-1024-FBO1 | Field Blank (open) | ND | NA | -- | NA | |
| 10/24/2019 | CHMB02-PM-1024-FBC2 | Field Blank (closed) | ND | NA | -- | NA | |
| 10/24/2019 | CHMB02-PM-1024-FBO3 | Field Blank (open) | -- | NA | NA | NA | |
| 10/24/2019 | CHMB02-PM-1024-FBC4 | Field Blank (closed) | -- | NA | NA | NA | |
| | | | | | | | |
| 10/25/2019 | CHMB02-AB01-1025 | Sta. 01 | <0.0031 | 0.01 | <0.40 | 12.1 | |
| 10/25/2019 | CHMB02-AB02-1025 | Sta. 02 | <0.0038 | 0.01 | <0.41 | 12.1 | |
| 10/25/2019 | CHMB02-AB03-1025 | Sta. 03 | <0.0032 | 0.01 | <0.44 | 12.1 | One non-asbestos structure detected. |
| 10/25/2019 | CHMB02-AB04-1025 | Sta. 04 | <0.0031 | 0.01 | <0.42 | 12.1 | |
| 10/25/2019 | CHMB02-AB05-1025 | Sta. Koppers | <0.0032 | 0.01 | <0.42 | 12.1 | |
| 10/25/2019 | CHMB02-AB06-1025 | Sta. Residence | <0.0031 | 0.01 | <0.42 | 12.1 | |
| 10/25/2019 | CHMB02-PM-KLC-1025 | Personal | <0.0028 | 0.01 | <0.38 | 12.1 | |
| 10/25/2019 | CHMB02-AB-1014- FBO1 | Field Blank (open) | ND | NA | -- | NA | |
| 10/25/2019 | CHMB02-AB-1014-FBO2 | Field Blank (open) | -- | NA | NA | NA | |
| 10/25/2019 | CHMB02-AB-1014-FBC3 | Field Blank (closed) | ND | NA | -- | NA | |
| 10/25/2019 | CHMB02-AB-1014-FBC4 | Field Blank (closed) | -- | NA | NA | NA | |
| | | | | | | | |
| 10/26/2019 | -- | Sta. 01 | -- | 0.01 | -- | 12.1 | |
| 10/26/2019 | -- | Sta. 02 | -- | 0.01 | -- | 12.1 | |
| 10/26/2019 | -- | Sta. 03 | -- | 0.01 | -- | 12.1 | |
| 10/26/2019 | -- | Sta. 04 | -- | 0.01 | -- | 12.1 | |
| 10/26/2019 | -- | Sta. Koppers | -- | 0.01 | -- | 12.1 | |
| 10/26/2019 | -- | Sta. Residence | -- | 0.01 | -- | 12.1 | No sampling- no soil moving activities took place. |
| 10/26/2019 | -- | Personal | -- | 0.01 | -- | 12.1 | |
| 10/26/2019 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 10/26/2019 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 10/26/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | |
| 10/26/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | |

Notes:
f/cc = fibers per cubic centimeter
NA = Not analyzed or not applicable
ND = No fibers were detected in the field blank
TEM = Transmission electron microscopy
$ug/m^3$ = microgram per cubic meter

Created by: LS_120319
Checked by: KC 120419

TABLE 2
Perimeter and Personal Air Monitoring Results
Week of 10/28/2019
Torch Lake Area of Concern - Mineral Building
Houghton County, MI

| Date | Sample ID | Sample Location | Asbestos Concentration (f/cc) (TEM analysis) | Action Limit (f/cc) | Lead Concentration ($ug/m^3$) | Action Limit ($ug/m^3$) | Notes |
|---|---|---|---|---|---|---|---|
| 10/28/2019 | CHMB02-AB01-1028 | Sta. 01 | <0.0027 | 0.01 | <0.34 | 12.1 | |
| 10/28/2019 | CHMB02-AB02-1028 | Sta. 02 | <0.0028 | 0.01 | <0.34 | 12.1 | One non-asbestos structure detected. |
| 10/28/2019 | CHMB02-AB03-1028 | Sta. 03 | <0.0028 | 0.01 | <0.35 | 12.1 | |
| 10/28/2019 | CHMB02-AB04-1028 | Sta. 04 | <0.0028 | 0.01 | <0.36 | 12.1 | One Anthophyllite fiber detected. |
| 10/28/2019 | CHMB02-AB05-1028 | Sta. Koppers | <0.0027 | 0.01 | <0.36 | 12.1 | |
| 10/28/2019 | CHMB02-AB06-1028 | Sta. Residence | <0.003 | 0.01 | <0.36 | 12.1 | |
| 10/28/2019 | CHMB02-PM-LJS-1028 | Personal | <0.0026 | 0.01 | <0.38 | 12.1 | Three non-asbestos structures detected. |
| 10/28/2019 | CHMB02-AB-1028- FBO1 | Field Blank (open) | ND | NA | -- | NA | |
| 10/28/2019 | CHMB02-AB-1028-FBO2 | Field Blank (open) | -- | NA | NA | NA | |
| 10/28/2019 | CHMB02-AB-1028-FBC3 | Field Blank (closed) | ND | NA | -- | NA | |
| 10/28/2019 | CHMB02-AB-1028-FBC4 | Field Blank (closed) | -- | NA | NA | NA | |
| | | | | | | | |
| 10/29/2019 | CHMB02-AB01-1029 | Sta. 01 | <0.0033 | 0.01 | <0.45 | 12.1 | |
| 10/29/2019 | CHMB02-AB02-1029 | Sta. 02 | <0.0033 | 0.01 | <0.43 | 12.1 | One non-asbestos structure detected. |
| 10/29/2019 | CHMB02-AB03-1029 | Sta. 03 | <0.0033 | 0.01 | <0.43 | 12.1 | |
| 10/29/2019 | CHMB02-AB04-1029 | Sta. 04 | <0.0033 | 0.01 | <0.43 | 12.1 | |
| 10/29/2019 | CHMB02-AB05-1029 | Sta. Koppers | <0.0031 | 0.01 | <0.43 | 12.1 | |
| 10/29/2019 | CHMB02-AB06-1029 | Sta. Residence | <0.0032 | 0.01 | <0.44 | 12.1 | |
| 10/29/2019 | CHMB02-PM-LJS-1029 | Personal | <0.0051 | 0.01 | <0.69 | 12.1 | |
| 10/29/2019 | CHMB02-AB-1029- FBO1 | Field Blank (open) | ND | NA | -- | NA | |
| 10/29/2019 | CHMB02-AB-1029-FBO2 | Field Blank (open) | -- | NA | NA | NA | |
| 10/29/2019 | CHMB02-AB-1029-FBC3 | Field Blank (closed) | ND | NA | -- | NA | |
| 10/29/2019 | CHMB02-AB-1029-FBC4 | Field Blank (closed) | -- | NA | NA | NA | |
| | | | | | | | |
| 10/30/2019 | CHMB02-AB01-1030 | Sta. 01 | <0.0033 | 0.01 | <0.45 | 12.1 | |
| 10/30/2019 | CHMB02-AB02-1030 | Sta. 02 | <0.0031 | 0.01 | <0.40 | 12.1 | |
| 10/30/2019 | CHMB02-AB03-1030 | Sta. 03 | <0.0031 | 0.01 | <0.39 | 12.1 | |
| 10/30/2019 | CHMB02-AB04-1030 | Sta. 04 | <0.0034 | 0.01 | <0.48 | 12.1 | |
| 10/30/2019 | CHMB02-AB05-1030 | Sta. Koppers | <0.0029 | 0.01 | <0.41 | 12.1 | |
| 10/30/2019 | CHMB02-AB06-1030 | Sta. Residence | <0.0030 | 0.01 | <0.41 | 12.1 | |
| 10/30/2019 | CHMB02-PM-LJS-1030 | Personal | <0.0032 | 0.01 | <0.39 | 12.1 | |
| 10/30/2019 | CHMB02-AB-1030- FBO1 | Field Blank (open) | ND | NA | -- | NA | |
| 10/30/2019 | CHMB02-AB-1030-FBO2 | Field Blank (open) | -- | NA | NA | NA | |
| 10/30/2019 | CHMB02-AB-1030-FBC3 | Field Blank (closed) | ND | NA | -- | NA | |
| 10/30/2019 | CHMB02-AB-1030-FBC4 | Field Blank (closed) | -- | NA | NA | NA | |
| | | | | | | | |
| 10/31/2019 | CHMB02-AB01-1031 | Sta. 01 | <0.0030 | 0.01 | <0.39 | 12.1 | |
| 10/31/2019 | CHMB02-AB02-1031 | Sta. 02 | <0.0031 | 0.01 | <0.40 | 12.1 | |
| 10/31/2019 | CHMB02-AB03-1031 | Sta. 03 | <0.0031 | 0.01 | <0.39 | 12.1 | |
| 10/31/2019 | CHMB02-AB04-1031 | Sta. 04 | <0.0034 | 0.01 | <0.48 | 12.1 | |
| 10/31/2019 | CHMB02-AB05-1031 | Sta. Koppers | <0.0029 | 0.01 | <0.41 | 12.1 | |
| 10/31/2019 | CHMB02-AB06-1031 | Sta. Residence | <0.0030 | 0.01 | <0.41 | 12.1 | |
| 10/31/2019 | CHMB02-PM-LJS-1031 | Personal | <0.0032 | 0.01 | <0.39 | 12.1 | |
| 10/31/2019 | CHMB02-AB-1031-FBO1 | Field Blank (open) | -- | NA | -- | NA | Did not collect open blanks. |
| 10/31/2019 | CHMB02-AB-1031-FBO2 | Field Blank (open) | -- | NA | -- | NA | Did not collect open blanks. |
| 10/31/2019 | CHMB02-AB-1031-FBC3 | Field Blank (closed) | ND | NA | -- | NA | |
| 10/31/2019 | CHMB02-AB-1031-FBC4 | Field Blank (closed) | -- | NA | NA | NA | |
| | | | | | | | |
| 11/1/2019 | CHMB02-AB01-1101 | Sta. 01 | <0.0030 | 0.01 | <0.43 | 12.1 | |
| 11/1/2019 | CHMB02-AB02-1101 | Sta. 02 | <0.0032 | 0.01 | <0.39 | 12.1 | |
| 11/1/2019 | CHMB02-AB03-1101 | Sta. 03 | <0.0030 | 0.01 | <0.39 | 12.1 | |
| 11/1/2019 | CHMB02-AB04-1101 | Sta. 04 | <0.0030 | 0.01 | <0.44 | 12.1 | |
| 11/1/2019 | CHMB02-AB05-1101 | Sta. Koppers | <0.0034 | 0.01 | <0.45 | 12.1 | |
| 11/1/2019 | CHMB02-AB06-1101 | Sta. Residence | <0.0037 | 0.01 | <0.44 | 12.1 | |
| 11/1/2019 | CHMB02-PM-LJS-1101 | Personal | -- | 0.01 | -- | 12.1 | Did not personal sample - half work day |
| 11/1/2019 | CHMB02-AB-1101- FBO1 | Field Blank (open) | ND | NA | -- | NA | |
| 11/1/2019 | CHMB02-AB-1101-FBO2 | Field Blank (open) | -- | NA | NA | NA | |
| 11/1/2019 | CHMB02-AB-1101-FBC3 | Field Blank (closed) | -- | NA | -- | NA | Did not collect closed blanks |
| 11/1/2019 | CHMB02-AB-1101-FBC4 | Field Blank (closed) | -- | NA | -- | NA | Did not collect closed blanks |
| | | | | | | | |
| 11/2/2019 | -- | Sta. 01 | -- | 0.01 | -- | 12.1 | No air monitoring - three week rotation, no soil moving activities. |
| 11/2/2019 | -- | Sta. 02 | -- | 0.01 | -- | 12.1 | |
| 11/2/2019 | -- | Sta. 03 | -- | 0.01 | -- | 12.1 | |
| 11/2/2019 | -- | Sta. 04 | -- | 0.01 | -- | 12.1 | |
| 11/2/2019 | -- | Sta. Koppers | -- | 0.01 | -- | 12.1 | |
| 11/2/2019 | -- | Sta. Residence | -- | 0.01 | -- | 12.1 | |
| 11/1/2019 | -- | Personal | -- | 0.01 | -- | 12.1 | |
| 11/2/2019 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 11/2/2019 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 11/2/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | |
| 11/2/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | |

Notes:
f/cc = fibers per cubic centimeter
NA = Not analyzed or not applicable
ND = No fibers were detected in the field blank
TEM = Transmission electron microscopy
$ug/m^3$ = microgram per cubic meter

Created by: LS_120319
Checked by: KC 120419

TABLE 2
Perimeter and Personal Air Monitoring Results
Week of 11/04/2019
Torch Lake Area of Concern - Mineral Building
Houghton County, MI

| Date | Sample ID | Sample Location | Asbestos Concentration (f/cc) (TEM analysis) | Action Limit (f/cc) | Lead Concentration ($ug/m^3$) | Action Limit ($ug/m^3$) | Notes |
|---|---|---|---|---|---|---|---|
| 11/4/2019 | -- | Sta. 01 | -- | 0.01 | -- | 12.1 | No air monitoring - travel day, no work on-site |
| 11/4/2019 | -- | Sta. 02 | -- | 0.01 | -- | 12.1 | |
| 11/4/2019 | -- | Sta. 03 | -- | 0.01 | -- | 12.1 | |
| 11/4/2019 | -- | Sta. 04 | -- | 0.01 | -- | 12.1 | |
| 11/4/2019 | -- | Sta. Koppers | -- | 0.01 | -- | 12.1 | |
| 11/4/2019 | -- | Sta. Residence | -- | 0.01 | -- | 12.1 | |
| 11/4/2019 | -- | Personal | -- | 0.01 | -- | 12.1 | |
| 11/4/2019 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 11/4/2019 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 11/4/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | |
| 11/4/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | |
| | | | | | | | |
| 11/5/2019 | -- | Sta. 01 | -- | 0.01 | -- | 12.1 | No air monitoring - snow covered site, wet conditions. |
| 11/5/2019 | -- | Sta. 02 | -- | 0.01 | -- | 12.1 | |
| 11/5/2019 | -- | Sta. 03 | -- | 0.01 | -- | 12.1 | |
| 11/5/2019 | -- | Sta. 04 | -- | 0.01 | -- | 12.1 | |
| 11/5/2019 | -- | Sta. Koppers | -- | 0.01 | -- | 12.1 | |
| 11/5/2019 | -- | Sta. Residence | -- | 0.01 | -- | 12.1 | |
| 11/5/2019 | -- | Personal | -- | 0.01 | -- | 12.1 | |
| 11/5/2019 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 11/5/2019 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 11/5/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | |
| 11/5/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | |
| | | | | | | | |
| 11/6/2019 | CHMB02-AB01-1106 | Sta. 01 | <0.0033 | 0.01 | <0.43 | 12.1 | |
| 11/6/2019 | CHMB02-AB02-1106 | Sta. 02 | <0.0034 | 0.01 | <0.42 | 12.1 | |
| 11/6/2019 | CHMB02-AB03-1106 | Sta. 03 | <0.0035 | 0.01 | <0.45 | 12.1 | |
| 11/6/2019 | CHMB02-AB04-1106 | Sta. 04 | <0.0038 | 0.01 | <0.44 | 12.1 | |
| 11/6/2019 | CHMB02-AB05-1106 | Sta. Koppers | <0.0036 | 0.01 | <0.44 | 12.1 | |
| 11/6/2019 | CHMB02-AB06-1106 | Sta. Residence | <0.0034 | 0.01 | <0.42 | 12.1 | |
| 11/6/2019 | CHMB02-PM-KLC-1106 | Personal | <0.0030 | 0.01 | <0.41 | 12.1 | |
| 11/6/2019 | CHMB02-PM-1106- FBO1 | Field Blank (open) | ND | NA | -- | NA | |
| 11/6/2019 | CHMB02-PM-1106-FBO2 | Field Blank (open) | -- | NA | NA | NA | |
| 11/6/2019 | CHMB02-PM-1106-FBC3 | Field Blank (closed) | ND | NA | -- | NA | |
| 11/6/2019 | CHMB02-PM-1106-FBC4 | Field Blank (closed) | -- | NA | NA | NA | |
| | | | | | | | |
| 11/7/2019 | CHMB02-AB01-1107 | Sta. 01 | <0.0035 | 0.01 | <0.44 | 12.1 | |
| 11/7/2019 | CHMB02-AB02-1107 | Sta. 02 | <0.0035 | 0.01 | <0.43 | 12.1 | |
| 11/7/2019 | CHMB02-AB03-1107 | Sta. 03 | <0.0034 | 0.01 | <0.44 | 12.1 | |
| 11/7/2019 | CHMB02-AB04-1107 | Sta. 04 | <0.0047 | 0.01 | <0.44 | 12.1 | |
| 11/7/2019 | CHMB02-AB05-1107 | Sta. Koppers | <0.0034 | 0.01 | <0.44 | 12.1 | |
| 11/7/2019 | CHMB02-AB06-1107 | Sta. Residence | <0.0033 | 0.01 | <0.44 | 12.1 | |
| 11/7/2019 | CHMB02-PM-LJS-1107 | Personal | <0.0030 | 0.01 | <0.40 | 12.1 | |
| 11/7/2019 | CHMB02-AB-1107-FBO1 | Field Blank (open) | ND | NA | -- | NA | |
| 11/7/2019 | CHMB02-AB-1107-FBO2 | Field Blank (open) | -- | NA | NA | NA | |
| 11/7/2019 | CHMB02-AB-1107-FBC3 | Field Blank (closed) | ND | NA | -- | NA | |
| 11/7/2019 | CHMB02-AB-1107-FBC4 | Field Blank (closed) | -- | NA | NA | NA | |
| | | | | | | | |
| 11/8/2019 | CHMB02-AB01-1108 | Sta. 01 | <0.0036 | 0.01 | <0.46 | 12.1 | One non-asbestos structure detected. |
| 11/8/2019 | CHMB02-AB02-1108 | Sta. 02 | <0.0034 | 0.01 | <0.46 | 12.1 | |
| 11/8/2019 | CHMB02-AB03-1108 | Sta. 03 | <0.0031 | 0.01 | <0.42 | 12.1 | |
| 11/8/2019 | CHMB02-AB04-1108 | Sta. 04 | <0.0039 | 0.01 | <0.43 | 12.1 | |
| 11/8/2019 | CHMB02-AB05-1108 | Sta. Koppers | <0.0031 | 0.01 | <0.47 | 12.1 | |
| 11/8/2019 | CHMB02-AB06-1108 | Sta. Residence | <0.0036 | 0.01 | <0.46 | 12.1 | One non-asbestos structure detected. |
| 11/8/2019 | CHMB02-PM-KLC-1108 | Personal | <0.0031 | 0.01 | <0.42 | 12.1 | |
| 11/8/2019 | CHMB02-AB-1108-FBO1 | Field Blank (open) | ND | NA | NA | NA | |
| 11/8/2019 | CHMB02-AB-1108-FBO2 | Field Blank (open) | ND | NA | NA | NA | |
| 11/8/2019 | CHMB02-AB-1108-FBC3 | Field Blank (closed) | ND | NA | NA | NA | |
| 11/8/2019 | CHMB02-AB-1108-FBC4 | Field Blank (closed) | ND | NA | NA | NA | |
| | | | | | | | |
| 11/9/2019 | -- | Sta. 01 | -- | 0.01 | -- | 12.1 | No air monitoring - rain. |
| 11/9/2019 | -- | Sta. 02 | -- | 0.01 | -- | 12.1 | |
| 11/9/2019 | -- | Sta. 03 | -- | 0.01 | -- | 12.1 | |
| 11/9/2019 | -- | Sta. 04 | -- | 0.01 | -- | 12.1 | |
| 11/9/2019 | -- | Sta. Koppers | -- | 0.01 | -- | 12.1 | |
| 11/9/2019 | -- | Sta. Residence | -- | 0.01 | -- | 12.1 | |
| 11/9/2019 | -- | Personal | -- | 0.01 | -- | 12.1 | |
| 11/9/2019 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 11/9/2019 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 11/9/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | |
| 11/9/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | |

Notes:
f/cc = fibers per cubic centimeter
NA = Not analyzed or not applicable
ND = No fibers were detected in the field blank
TEM = Transmission electron microscopy
$ug/m^3$ = microgram per cubic meter

Created by: LS_120319
Checked by: KC 120419

TABLE 2
Perimeter and Personal Air Monitoring Results
Week of 11/11/2019
Torch Lake Area of Concern - Mineral Building
Houghton County, MI

| Date | Sample ID | Sample Location | Asbestos Concentration (f/cc) (TEM analysis) | Action Limit (f/cc) | Lead Concentration ($ug/m^3$) | Action Limit ($ug/m^3$) | Notes |
|---|---|---|---|---|---|---|---|
| 11/11/2019 | -- | Sta. 01 | -- | 0.01 | -- | 12.1 | No air monitoring - heavy snow, no asbestos containing soil movement |
| 11/11/2019 | -- | Sta. 02 | -- | 0.01 | -- | 12.1 | |
| 11/11/2019 | -- | Sta. 03 | -- | 0.01 | -- | 12.1 | |
| 11/11/2019 | -- | Sta. 04 | -- | 0.01 | -- | 12.1 | |
| 11/11/2019 | -- | Sta. Koppers | -- | 0.01 | -- | 12.1 | |
| 11/11/2019 | -- | Sta. Residence | -- | 0.01 | -- | 12.1 | |
| 11/11/2019 | -- | Personal | -- | 0.01 | -- | 12.1 | |
| 11/11/2019 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 11/11/2019 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 11/11/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | |
| 11/11/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | |
| | | | | | | | |
| 11/12/2019 | CHMB02-AB01-1112 | Sta. 01 | <0.0037 | 0.01 | <0.50 | 12.1 | |
| 11/12/2019 | CHMB02-AB02-1112 | Sta. 02 | <0.0045 | 0.01 | <0.51 | 12.1 | |
| 11/12/2019 | CHMB02-AB03-1112 | Sta. 03 | <0.0041 | 0.01 | <0.45 | 12.1 | |
| 11/12/2019 | CHMB02-AB04-1112 | Sta. 04 | <0.0034 | 0.01 | <0.44 | 12.1 | |
| 11/12/2019 | CHMB02-AB05-1112 | Sta. Koppers | <0.0034 | 0.01 | <0.44 | 12.1 | |
| 11/12/2019 | CHMB02-AB06-1112 | Sta. Residence | <0.0034 | 0.01 | <0.47 | 12.1 | |
| 11/12/2019 | CHMB02-PM-LJS-1112 | Personal | <0.0034 | 0.01 | <0.47 | 12.1 | |
| 11/12/2019 | CHMB02-AB-1112-FBO1 | Field Blank (open) | ND | NA | NA | NA | |
| 11/12/2019 | CHMB02-AB-1112-FBO2 | Field Blank (open) | ND | NA | NA | NA | |
| 11/12/2019 | CHMB02-AB-1112-FBC3 | Field Blank (closed) | ND | NA | NA | NA | |
| 11/12/2019 | CHMB02-AB-1112-FBC4 | Field Blank (closed) | ND | NA | NA | NA | |
| | | | | | | | |
| 11/13/2019 | CHMB02-AB01-1113 | Sta. 01 | <0.0038 | 0.01 | <0.47 | 12.1 | |
| 11/13/2019 | CHMB02-AB02-1113 | Sta. 02 | <0.0039 | 0.01 | <0.48 | 12.1 | |
| 11/13/2019 | CHMB02-AB03-1113 | Sta. 03 | <0.0034 | 0.01 | <0.49 | 12.1 | |
| 11/13/2019 | CHMB02-AB04-1113 | Sta. 04 | <0.0034 | 0.01 | <0.47 | 12.1 | |
| 11/13/2019 | CHMB02-AB05-1113 | Sta. Koppers | <0.0037 | 0.01 | <0.47 | 12.1 | |
| 11/13/2019 | CHMB02-AB06-1113 | Sta. Residence | <0.0037 | 0.01 | <0.54 | 12.1 | |
| 11/13/2019 | CHMB02-PM-KLC-1113 | Personal | <0.0034 | 0.01 | <0.47 | 12.1 | |
| 11/13/2019 | CHMB02-AB-1113-FBO1 | Field Blank (open) | ND | NA | -- | NA | |
| 11/13/2019 | CHMB02-AB-1113-FBO2 | Field Blank (open) | -- | NA | NA | NA | |
| 11/13/2019 | CHMB02-AB-1113-FBC3 | Field Blank (closed) | ND | NA | -- | NA | |
| 11/13/2019 | CHMB02-AB-1113-FBC4 | Field Blank (closed) | -- | NA | NA | NA | |
| | | | | | | | |
| 11/14/2019 | CHMB02-AB01-1114 | Sta. 01 | <0.0044 | 0.01 | <0.54 | 12.1 | |
| 11/14/2019 | CHMB02-AB02-1114 | Sta. 02 | <0.0050 | 0.01 | <0.62 | 12.1 | |
| 11/14/2019 | CHMB02-AB03-1114 | Sta. 03 | <0.0046 | 0.01 | <0.55 | 12.1 | |
| 11/14/2019 | CHMB02-AB04-1114 | Sta. 04 | <0.0051 | 0.01 | <0.59 | 12.1 | |
| 11/14/2019 | CHMB02-AB05-1114 | Sta. Koppers | <0.0044 | 0.01 | <0.56 | 12.1 | |
| 11/14/2019 | CHMB02-AB06-1114 | Sta. Residence | <0.0046 | 0.01 | <0.59 | 12.1 | |
| 11/14/2019 | CHMB02-PM-LJS-1114 | Personal | <0.0039 | 0.01 | <0.53 | 12.1 | |
| 11/14/2019 | CHMB02-PM-1114-FBO1 | Field Blank (open) | ND | NA | -- | NA | |
| 11/14/2019 | CHMB02-PM-1114-FBO2 | Field Blank (open) | -- | NA | NA | NA | |
| 11/14/2019 | CHMB02-PM-1114-FBC3 | Field Blank (closed) | ND | NA | -- | NA | |
| 11/14/2019 | CHMB02-PM-1114-FBC4 | Field Blank (closed) | -- | NA | NA | NA | |
| | | | | | | | |
| 11/15/2019 | -- | Sta. 01 | -- | 0.01 | -- | 12.1 | No air monitoring - No earth moving. |
| 11/15/2019 | -- | Sta. 02 | -- | 0.01 | -- | 12.1 | |
| 11/15/2019 | -- | Sta. 03 | -- | 0.01 | -- | 12.1 | |
| 11/15/2019 | -- | Sta. 04 | -- | 0.01 | -- | 12.1 | |
| 11/15/2019 | -- | Sta. Koppers | -- | 0.01 | -- | 12.1 | |
| 11/15/2019 | -- | Sta. Residence | -- | 0.01 | -- | 12.1 | |
| 11/15/2019 | -- | Personal | -- | 0.01 | -- | 12.1 | |
| 11/15/2019 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 11/15/2019 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 11/15/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | |
| 11/15/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | |
| | | | | | | | |
| 11/16/2019 | -- | Sta. 01 | -- | 0.01 | -- | 12.1 | No air monitoring - no work completed. |
| 11/16/2019 | -- | Sta. 02 | -- | 0.01 | -- | 12.1 | |
| 11/16/2019 | -- | Sta. 03 | -- | 0.01 | -- | 12.1 | |
| 11/16/2019 | -- | Sta. 04 | -- | 0.01 | -- | 12.1 | |
| 11/16/2019 | -- | Sta. Koppers | -- | 0.01 | -- | 12.1 | |
| 11/16/2019 | -- | Sta. Residence | -- | 0.01 | -- | 12.1 | |
| 11/16/2019 | -- | Personal | -- | 0.01 | -- | 12.1 | |
| 11/16/2019 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 11/16/2019 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 11/16/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | |
| 11/16/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | |

Notes:
f/cc = fibers per cubic centimeter
NA = Not analyzed or not applicable
ND = No fibers were detected in the field blank
TEM = Transmission electron microscopy
$ug/m^3$ = microgram per cubic meter

Created by: LS_120319
Checked by: KC 120419

TABLE 2
Perimeter and Personal Air Monitoring Results
Week of 11/18/2019
Torch Lake Area of Concern - Mineral Building
Houghton County, MI

| Date | Sample ID | Sample Location | Asbestos Concentration (f/cc) (TEM analysis) | Action Limit (f/cc) | Lead Concentration ($ug/m^3$) | Action Limit ($ug/m^3$) | Notes |
|---|---|---|---|---|---|---|---|
| 11/18/2019 | -- | Sta. 01 | -- | 0.01 | -- | 12.1 | No air monitoring - rain and wet soil conditions |
| 11/18/2019 | -- | Sta. 02 | -- | 0.01 | -- | 12.1 | |
| 11/18/2019 | -- | Sta. 03 | -- | 0.01 | -- | 12.1 | |
| 11/18/2019 | -- | Sta. 04 | -- | 0.01 | -- | 12.1 | |
| 11/18/2019 | -- | Sta. Koppers | -- | 0.01 | -- | 12.1 | |
| 11/18/2019 | -- | Sta. Residence | -- | 0.01 | -- | 12.1 | |
| 11/18/2019 | -- | Personal | -- | 0.01 | -- | 12.1 | |
| 11/18/2019 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 11/18/2019 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 11/18/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | |
| 11/18/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | |
| | | | | | | | |
| 11/19/2019 | CHMB02-AB01-1119 | Sta. 01 | <0.0032 | 0.01 | <0.41 | 12.1 | |
| 11/19/2019 | CHMB02-AB02-1119 | Sta. 02 | <0.0033 | 0.01 | <0.42 | 12.1 | |
| 11/19/2019 | CHMB02-AB03-1119 | Sta. 03 | <0.0028 | 0.01 | <0.43 | 12.1 | |
| 11/19/2019 | CHMB02-AB04-1119 | Sta. 04 | <0.0029 | 0.01 | <0.39 | 12.1 | 0.5 non-asbestos structure detected. |
| 11/19/2019 | CHMB02-AB05-1119 | Sta. Koppers | <0.0033 | 0.01 | <0.41 | 12.1 | |
| 11/19/2019 | CHMB02-AB06-1112 | Sta. Residence | <0.0038 | 0.01 | <0.52 | 12.1 | |
| 11/19/2019 | CHMB02-PM-LJS-1119 | Personal | <0.0028 | 0.01 | <0.38 | 12.1 | |
| 11/19/2019 | CHMB02-AB-1119-FBO1 | Field Blank (open) | ND | NA | - | NA | |
| 11/19/2019 | CHMB02-AB-1119-FBO2 | Field Blank (open) | - | NA | NA | NA | |
| 11/19/2019 | CHMB02-AB-1119-FBC3 | Field Blank (closed) | ND | NA | - | NA | |
| 11/19/2019 | CHMB02-AB-1119-FBC4 | Field Blank (closed) | - | NA | NA | NA | |
| | | | | | | | |
| 11/20/2019 | -- | Sta. 01 | -- | 0.01 | -- | 12.1 | No air monitoring - rain and wet soil conditions. |
| 11/20/2019 | -- | Sta. 02 | -- | 0.01 | -- | 12.1 | |
| 11/20/2019 | -- | Sta. 03 | -- | 0.01 | -- | 12.1 | |
| 11/20/2019 | -- | Sta. 04 | -- | 0.01 | -- | 12.1 | |
| 11/20/2019 | -- | Sta. Koppers | -- | 0.01 | -- | 12.1 | |
| 11/20/2019 | -- | Sta. Residence | -- | 0.01 | -- | 12.1 | |
| 11/20/2019 | -- | Personal | -- | 0.01 | -- | 12.1 | |
| 11/20/2019 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 11/20/2019 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 11/20/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | |
| 11/20/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | |
| | | | | | | | |
| 11/21/2019 | -- | Sta. 01 | -- | 0.01 | -- | 12.1 | No air monitoring - Demobilization of site. |
| 11/21/2019 | -- | Sta. 02 | -- | 0.01 | -- | 12.1 | |
| 11/21/2019 | -- | Sta. 03 | -- | 0.01 | -- | 12.1 | |
| 11/21/2019 | -- | Sta. 04 | -- | 0.01 | -- | 12.1 | |
| 11/21/2019 | -- | Sta. Koppers | -- | 0.01 | -- | 12.1 | |
| 11/21/2019 | -- | Sta. Residence | -- | 0.01 | -- | 12.1 | |
| 11/21/2019 | -- | Personal | -- | 0.01 | -- | 12.1 | |
| 11/21/2019 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 11/21/2019 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 11/21/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | |
| 11/21/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | |
| | | | | | | | |
| 11/22/2019 | -- | Sta. 01 | -- | 0.01 | -- | 12.1 | No air monitoring - Off-site for the winter. |
| 11/22/2019 | -- | Sta. 02 | -- | 0.01 | -- | 12.1 | |
| 11/22/2019 | -- | Sta. 03 | -- | 0.01 | -- | 12.1 | |
| 11/22/2019 | -- | Sta. 04 | -- | 0.01 | -- | 12.1 | |
| 11/22/2019 | -- | Sta. Koppers | -- | 0.01 | -- | 12.1 | |
| 11/22/2019 | -- | Sta. Residence | -- | 0.01 | -- | 12.1 | |
| 11/22/2019 | -- | Personal | -- | 0.01 | -- | 12.1 | |
| 11/22/2019 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 11/22/2019 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 11/22/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | |
| 11/22/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | |
| | | | | | | | |
| 11/23/2019 | -- | Sta. 01 | -- | 0.01 | -- | 12.1 | No air monitoring - Off-site for the winter. |
| 11/23/2019 | -- | Sta. 02 | -- | 0.01 | -- | 12.1 | |
| 11/23/2019 | -- | Sta. 03 | -- | 0.01 | -- | 12.1 | |
| 11/23/2019 | -- | Sta. 04 | -- | 0.01 | -- | 12.1 | |
| 11/23/2019 | -- | Sta. Koppers | -- | 0.01 | -- | 12.1 | |
| 11/23/2019 | -- | Sta. Residence | -- | 0.01 | -- | 12.1 | |
| 11/23/2019 | -- | Personal | -- | 0.01 | -- | 12.1 | |
| 11/23/2019 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 11/23/2019 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 11/23/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | |
| 11/23/2019 | -- | Field Blank (closed) | -- | NA | -- | NA | |

Notes:
f/cc = fibers per cubic centimeter
NA = Not analyzed or not applicable
ND = No fibers were detected in the field blank
TEM = Transmission electron microscopy
$ug/m^3$ = microgram per cubic meter

Created by: LS_120319
Checked by: KC 120419

TABLE 2
Perimeter and Personal Air Monitoring Results
Week of 07/06/2020
Torch Lake Area of Concern - Mineral Building
Houghton County, MI

| Date | Sample ID | Sample Location | Asbestos Concentration (f/cc) (TEM analysis) | Action Limit (f/cc) | Lead Concentration ($ug/m^3$) | Action Limit ($ug/m^3$) | Notes |
|---|---|---|---|---|---|---|---|
| 7/6/2020 | -- | Sta. 01 | -- | 0.01 | -- | 12.1 | No air monitoring - travel day. |
| 7/6/2020 | -- | Sta. 02 | -- | 0.01 | -- | 12.1 | |
| 7/6/2020 | -- | Sta. 03 | -- | 0.01 | -- | 12.1 | |
| 7/6/2020 | -- | Sta. 04 | -- | 0.01 | -- | 12.1 | |
| 7/6/2020 | -- | Sta. Koppers | -- | 0.01 | -- | 12.1 | |
| 7/6/2020 | -- | Sta. Residence | -- | 0.01 | -- | 12.1 | |
| 7/6/2020 | -- | Personal | -- | 0.01 | -- | 12.1 | |
| 7/6/2020 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 7/6/2020 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 7/6/2020 | -- | Field Blank (closed) | -- | NA | -- | NA | |
| 7/6/2020 | -- | Field Blank (closed) | -- | NA | -- | NA | |
| | | | | | | | |
| 7/7/2020 | -- | Sta. 01 | -- | 0.01 | -- | 12.1 | No air monitoring - no earthmoving work in the exclusion zone. |
| 7/7/2020 | -- | Sta. 02 | -- | 0.01 | -- | 12.1 | |
| 7/7/2020 | -- | Sta. 03 | -- | 0.01 | -- | 12.1 | |
| 7/7/2020 | -- | Sta. 04 | -- | 0.01 | -- | 12.1 | |
| 7/7/2020 | -- | Sta. Koppers | -- | 0.01 | -- | 12.1 | |
| 7/7/2020 | -- | Sta. Residence | -- | 0.01 | -- | 12.1 | |
| 7/7/2020 | -- | Personal | -- | 0.01 | -- | 12.1 | |
| 7/7/2020 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 7/7/2020 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 7/7/2020 | -- | Field Blank (closed) | -- | NA | -- | NA | |
| 7/7/2020 | -- | Field Blank (closed) | -- | NA | -- | NA | |
| | | | | | | | |
| 7/8/2020 | -- | Sta. 01 | -- | 0.01 | -- | 12.1 | No air monitoring - no earthmoving work in the exclusion zone. |
| 7/8/2020 | -- | Sta. 02 | -- | 0.01 | -- | 12.1 | |
| 7/8/2020 | -- | Sta. 03 | -- | 0.01 | -- | 12.1 | |
| 7/8/2020 | -- | Sta. 04 | -- | 0.01 | -- | 12.1 | |
| 7/8/2020 | -- | Sta. Koppers | -- | 0.01 | -- | 12.1 | |
| 7/8/2020 | -- | Sta. Residence | -- | 0.01 | -- | 12.1 | |
| 7/8/2020 | -- | Personal | -- | 0.01 | -- | 12.1 | |
| 7/8/2020 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 7/8/2020 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 7/8/2020 | -- | Field Blank (closed) | -- | NA | -- | NA | |
| 7/8/2020 | -- | Field Blank (closed) | -- | NA | -- | NA | |
| | | | | | | | |
| 7/9/2020 | -- | Sta. 01 | -- | 0.01 | -- | 12.1 | No air monitoring - earthmoving work in the exclusion zone did not start until late afternoon. |
| 7/9/2020 | -- | Sta. 02 | -- | 0.01 | -- | 12.1 | |
| 7/9/2020 | -- | Sta. 03 | -- | 0.01 | -- | 12.1 | |
| 7/9/2020 | -- | Sta. 04 | -- | 0.01 | -- | 12.1 | |
| 7/9/2020 | -- | Sta. Koppers | -- | 0.01 | -- | 12.1 | |
| 7/9/2020 | -- | Sta. Residence | -- | 0.01 | -- | 12.1 | |
| 7/9/2020 | -- | Personal | -- | 0.01 | -- | 12.1 | |
| 7/9/2020 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 7/9/2020 | -- | Field Blank (open) | -- | NA | -- | NA | |
| 7/9/2020 | -- | Field Blank (closed) | -- | NA | -- | NA | |
| 7/9/2020 | -- | Field Blank (closed) | -- | NA | -- | NA | |
| | | | | | | | |
| 7/10/2020 | CHMB02-AB01-0710 | Sta. 01* | <0.0029 | 0.01 | NA | 12.1 | One non-asbestos structure detected. |
| 7/10/2020 | CHMB02-AB02-0710 | Sta. 02* | <0.0029 | 0.01 | NA | 12.1 | |
| 7/10/2020 | CHMB02-AB03-0710 | Sta. 03 | <0.003 | 0.01 | NA | 12.1 | One non-asbestos structure detected. |
| 7/10/2020 | CHMB02-AB04-0710 | Sta. 04* | <0.0029 | 0.01 | NA | 12.1 | Did not receive all pumps from SGS Galson, only have enough to sample for asbestos. |
| 7/10/2020 | CHMB02-AB05-0710 | Sta. Koppers | <0.0028 | 0.01 | NA | 12.1 | |
| 7/10/2020 | CHMB02-AB06-0710 | Sta. Residence | <0.003 | 0.01 | NA | 12.1 | |
| 7/10/2020 | CHMB02-PM-KLC-0710 | Personal | <0.0027 | 0.01 | NA | 12.1 | 1.5 non-asbestos structures detected. |
| 7/10/2020 | CHMB02-AB-0710-FBO1 | Field Blank (open) | -- | NA | -- | NA | |
| 7/10/2020 | CHMB02-AB-0710-FBO2 | Field Blank (open) | -- | NA | NA | NA | |
| 7/10/2020 | CHMB02-AB-0710-FBC1 | Field Blank (closed) | -- | NA | -- | NA | |
| 7/10/2020 | CHMB02-AB-0710-FBC2 | Field Blank (closed) | -- | NA | NA | NA | |
| | | | | | | | |
| 7/11/2020 | CHMB02-AB01-0711 | Sta. 01* | <0.0033 | 0.01 | <0.45 | 12.1 | |
| 7/11/2020 | CHMB02-AB02-0711 | Sta. 02* | <0.0032 | 0.01 | <0.43 | 12.1 | 0.5 non-asbestos structure detected. |
| 7/11/2020 | CHMB02-AB03-0711 | Sta. 03 | <0.0034 | 0.01 | <0.44 | 12.1 | |
| 7/11/2020 | CHMB02-AB04-0711 | Sta. 04* | <0.0033 | 0.01 | <0.45 | 12.1 | |
| 7/11/2020 | CHMB02-AB05-0711 | Sta. Koppers | <0.0032 | 0.01 | <0.44 | 12.1 | |
| 7/11/2020 | CHMB02-AB06-0711 | Sta. Residence | <0.0034 | 0.01 | <0.45 | 12.1 | |
| 7/11/2020 | CHMB02-PM-LJS-0711 | Personal | <0.0033 | 0.01 | <0.46 | 12.1 | |
| 7/11/2020 | CHMB02-AB-0711-FBO1 | Field Blank (open) | -- | NA | -- | NA | |
| 7/11/2020 | CHMB02-AB-0711-FBO2 | Field Blank (open) | -- | NA | -- | NA | |
| 7/11/2020 | CHMB02-AB-0711-FBC1 | Field Blank (closed) | -- | NA | -- | NA | |
| 7/11/2020 | CHMB02-AB-0711-FBC2 | Field Blank (closed) | -- | NA | -- | NA | |

Notes:
f/cc = fibers per cubic centimeter
NA = Not analyzed or not applicable
ND = No fibers were detected in the field blank
TEM = Transmission electron microscopy
$ug/m^3$ = microgram per cubic meter
* Indicates the air monitoring sampling station locations were changed to match the locations noted as the 2020 air monitoring stations on Figure 3.

Created by: LJS 090120
Checked by: KLC 090220

TABLE 2
Perimeter and Personal Air Monitoring Results
Week of 07/13/2020
Torch Lake Area of Concern - Mineral Building
Houghton County, MI

| Date | Sample ID | Sample Location | Asbestos Concentration (f/cc) (TEM analysis) | Action Limit (f/cc) | Lead Concentration ($ug/m^3$) | Action Limit (ug/m3) | Particulate/ Aerosol ($mg/m^3$) | Action Limit ($mg/m^3$) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| 7/13/2020 | CHMB02-AB01-0713 | Sta. 01* | <0.0026 | 0.01 | <0.36 | 12.1 | 0.032 | 0.9 | |
| 7/13/2020 | CHMB02-AB02-0713 | Sta. 02* | <0.0028 | 0.01 | <0.37 | 12.1 | -- | -- | |
| 7/13/2020 | CHMB02-AB03-0713 | Sta. 03 | <0.0027 | 0.01 | <0.37 | 12.1 | -- | -- | |
| 7/13/2020 | CHMB02-AB04-0713 | Sta. 04* | <0.0027 | 0.01 | <0.36 | 12.1 | -- | -- | |
| 7/13/2020 | CHMB02-AB05-0713 | Sta. Koppers | <0.0027 | 0.01 | <0.38 | 12.1 | -- | -- | |
| 7/13/2020 | CHMB02-AB06-0713 | Sta. Residence | <0.0028 | 0.01 | <0.37 | 12.1 | -- | -- | |
| 7/13/2020 | CHMB02-PM-KLC-0713 | Personal | <0.0027 | 0.01 | <0.36 | 12.1 | -- | -- | One amosite fiber and one non-asbestos structure detected. |
| 7/13/2020 | CHMB02-AB-0713-FBO1 | Field Blank (open) | NA | NA | NA | 12.1 | -- | -- | |
| 7/13/2020 | CHMB02-AB-0713-FBO2 | Field Blank (open) | NA | NA | NA | 12.1 | -- | -- | |
| 7/13/2020 | CHMB02-AB-0713-FBC1 | Field Blank (closed) | NA | NA | NA | 12.1 | -- | -- | |
| 7/13/2020 | CHMB02-AB-0713-FBC2 | Field Blank (closed) | NA | NA | NA | 12.1 | -- | -- | |
| | | | | | | | | | |
| 7/14/2020 | CHMB02-AB01-0714 | Sta. 01* | <0.004 | 0.01 | <0.51 | 12.1 | <0.035 | 0.9 | |
| 7/14/2020 | CHMB02-AB02-0714 | Sta. 02* | <0.0037 | 0.01 | <0.53 | 12.1 | -- | -- | |
| 7/14/2020 | CHMB02-AB03-0714 | Sta. 03 | <0.0038 | 0.01 | <0.54 | 12.1 | -- | -- | 0.5 non-asbestos structure detected. |
| 7/14/2020 | CHMB02-AB04-0714 | Sta. 04* | <0.0039 | 0.01 | <0.50 | 12.1 | -- | -- | |
| 7/14/2020 | CHMB02-AB05-0714 | Sta. Koppers | <0.0039 | 0.01 | <0.56 | 12.1 | -- | -- | One non-asbestos structure detected. |
| 7/14/2020 | CHMB02-AB06-0714 | Sta. Residence | <0.0039 | 0.01 | <0.54 | 12.1 | -- | -- | |
| 7/14/2020 | CHMB02-PM-LJS-0714 | Personal | <0.044 | 0.01 | <0.52 | 12.1 | -- | -- | |
| 7/14/2020 | CHMB02-AB-0714-FBO1 | Field Blank (open) | NA | 0.01 | NA | 12.1 | -- | -- | |
| 7/14/2020 | CHMB02-AB-0714-FBO2 | Field Blank (open) | NA | 0.01 | NA | 12.1 | -- | -- | |
| 7/14/2020 | CHMB02-AB-0714-FBC1 | Field Blank (closed) | NA | 0.01 | NA | 12.1 | -- | -- | |
| 7/14/2020 | CHMB02-AB-0714-FBC2 | Field Blank (closed) | NA | 0.01 | NA | 12.1 | -- | -- | |
| | | | | | | | | | |
| 7/15/2020 | CHMB02-AB01-0715 | Sta. 01* | <0.0024 | 0.01 | <0.33 | 12.1 | <0.035 | 0.9 | One non-asbestos structure detected. |
| 7/15/2020 | CHMB02-AB02-0715 | Sta. 02* | <0.0023 | 0.01 | <0.31 | 12.1 | -- | -- | One non-asbestos structure detected. |
| 7/15/2020 | CHMB02-AB03-0715 | Sta. 03 | <0.0023 | 0.01 | <0.33 | 12.1 | -- | -- | |
| 7/15/2020 | CHMB02-AB04-0715 | Sta. 04* | <0.0024 | 0.01 | <0.34 | 12.1 | -- | -- | |
| 7/15/2020 | CHMB02-AB05-0715 | Sta. Koppers | <0.0023 | 0.01 | <0.32 | 12.1 | -- | -- | |
| 7/15/2020 | CHMB02-AB06-0715 | Sta. Residence | <0.0024 | 0.01 | <0.32 | 12.1 | -- | -- | |
| 7/15/2020 | CHMB02-PM-KLC-0715 | Personal | <0.0025 | 0.01 | <0.31 | 12.1 | -- | -- | |
| 7/15/2020 | CHMB02-AB-0715-FBO1 | Field Blank (open) | NA | 0.01 | NA | 12.1 | -- | -- | |
| 7/15/2020 | CHMB02-AB-0715-FBO2 | Field Blank (open) | NA | 0.01 | NA | 12.1 | -- | -- | |
| 7/15/2020 | CHMB02-AB-0715-FBC1 | Field Blank (closed) | NA | 0.01 | NA | 12.1 | -- | -- | |
| 7/15/2020 | CHMB02-AB-0715-FBC2 | Field Blank (closed) | NA | 0.01 | NA | 12.1 | -- | -- | |
| | | | | | | | | | |
| 7/16/2020 | CHMB02-AB01-0716 | Sta. 01* | <0.0025 | 0.01 | <0.34 | 12.1 | <0.039 | 0.9 | One non-asbestos structure detected. |
| 7/16/2020 | CHMB02-AB02-0716 | Sta. 02* | <0.0025 | 0.01 | <0.34 | 12.1 | -- | -- | One non-asbestos structure detected. |
| 7/16/2020 | CHMB02-AB03-0716 | Sta. 03 | <0.0025 | 0.01 | <0.33 | 12.1 | -- | -- | |
| 7/16/2020 | CHMB02-AB04-0716 | Sta. 04* | <0.0026 | 0.01 | <0.34 | 12.1 | -- | -- | |
| 7/16/2020 | CHMB02-AB05-0716 | Sta. Koppers | <0.0024 | 0.01 | <0.33 | 12.1 | -- | -- | |
| 7/16/2020 | CHMB02-AB06-0716 | Sta. Residence | <0.0027 | 0.01 | <0.35 | 12.1 | -- | -- | |
| 7/16/2020 | CHMB02-PM-LJS-0716 | Personal | <0.0025 | 0.01 | <0.34 | 12.1 | -- | -- | |
| 7/16/2020 | CHMB02-AB-0716-FBO1 | Field Blank (open) | NA | 0.01 | NA | 12.1 | -- | -- | |
| 7/16/2020 | CHMB02-AB-0716-FBO2 | Field Blank (open) | NA | 0.01 | NA | 12.1 | -- | -- | |
| 7/16/2020 | CHMB02-AB-0716-FBC1 | Field Blank (closed) | NA | 0.01 | NA | 12.1 | -- | -- | |
| 7/16/2020 | CHMB02-AB-0716-FBC2 | Field Blank (closed) | NA | 0.01 | NA | 12.1 | -- | -- | |
| | | | | | | | | | |
| 7/17/2020 | CHMB02-AB01-0717 | Sta. 01* | <0.0026 | 0.01 | <0.35 | 12.1 | 0.071 | 0.9 | |
| 7/17/2020 | CHMB02-AB02-0717 | Sta. 02* | <0.0025 | 0.01 | <0.35 | 12.1 | -- | -- | |
| 7/17/2020 | CHMB02-AB03-0717 | Sta. 03 | <0.0025 | 0.01 | <0.34 | 12.1 | -- | -- | |
| 7/17/2020 | CHMB02-AB04-0717 | Sta. 04* | <0.0027 | 0.01 | <0.36 | 12.1 | -- | -- | |
| 7/17/2020 | CHMB02-AB05-0717 | Sta. Koppers | <0.0025 | 0.01 | <0.34 | 12.1 | -- | -- | |
| 7/17/2020 | CHMB02-AB06-0717 | Sta. Residence | <0.0027 | 0.01 | <0.37 | 12.1 | -- | -- | |
| 7/17/2020 | CHMB02-PM-KLC-0717 | Personal | <0.0026 | 0.01 | <0.35 | 12.1 | -- | -- | One non-asbestos structure detected. |
| 7/17/2020 | CHMB02-AB-0717-FBO1 | Field Blank (open) | NA | 0.01 | NA | 12.1 | -- | -- | |
| 7/17/2020 | CHMB02-AB-0717-FBO2 | Field Blank (open) | NA | 0.01 | NA | 12.1 | -- | -- | |
| 7/17/2020 | CHMB02-AB-0717-FBC1 | Field Blank (closed) | NA | 0.01 | NA | 12.1 | -- | -- | |
| 7/17/2020 | CHMB02-AB-0717-FBC2 | Field Blank (closed) | NA | 0.01 | NA | 12.1 | -- | -- | |
| | | | | | | | | | |
| 7/18/2020 | -- | Sta. 01* | -- | 0.01 | -- | 12.1 | -- | -- | No air monitoring - heavy rain in the morning. |
| 7/18/2020 | -- | Sta. 02* | -- | 0.01 | -- | 12.1 | -- | -- | |
| 7/18/2020 | -- | Sta. 03 | -- | 0.01 | -- | 12.1 | -- | -- | |
| 7/18/2020 | -- | Sta. 04* | -- | 0.01 | -- | 12.1 | -- | -- | |
| 7/18/2020 | -- | Sta. Koppers | -- | 0.01 | -- | 12.1 | -- | -- | |
| 7/18/2020 | -- | Sta. Residence | -- | 0.01 | -- | 12.1 | -- | -- | |
| 7/18/2020 | -- | Personal | -- | 0.01 | -- | 12.1 | -- | -- | |
| 7/18/2020 | -- | Field Blank (open) | -- | 0.01 | -- | 12.1 | -- | -- | |
| 7/18/2020 | -- | Field Blank (open) | -- | 0.01 | -- | 12.1 | -- | -- | |
| 7/18/2020 | -- | Field Blank (closed) | -- | 0.01 | -- | 12.1 | -- | -- | |
| 7/18/2020 | -- | Field Blank (closed) | -- | 0.01 | -- | 12.1 | -- | -- | |

Notes:
f/cc = fibers per cubic centimeter
NA = Not analyzed or not applicable
TEM = Transmission electron microscopy
$mg/m^3$ = milligram per cubic meter
$ug/m^3$ = microgram per cubic meter
* Indicates the air monitoring sampling station locations were changed to match the locations noted as the 2020 air monitoring stations on Figure 3.

Created by: LJS 090120
Checked by: KLC 090220

TABLE 2
Perimeter and Personal Air Monitoring Results
Week of 07/20/2020
Torch Lake Area of Concern - Mineral Building
Houghton County, MI

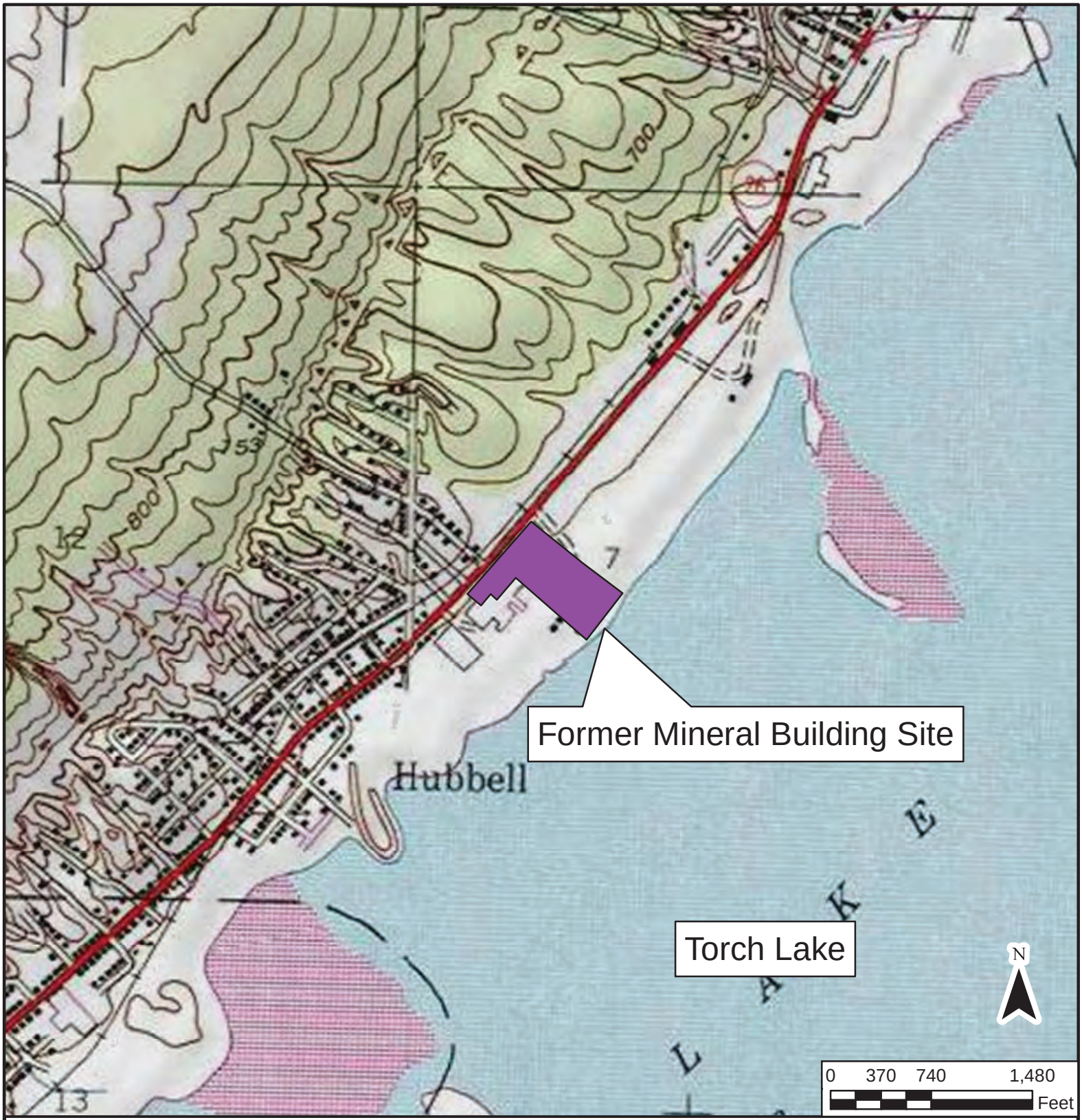
| Date | Sample ID | Sample Location | Asbestos Concentration (f/cc) (TEM analysis) | Action Limit (f/cc) | Lead Concentration ($ug/m^3$) | Action Limit ($ug/m^3$) | Particulate/ Aerosol ($mg/m^3$) | Action Limit ($mg/m^3$) | Notes |
|---|---|---|---|---|---|---|---|---|---|
| 7/20/2020 | CHMB02-AB01-0720 | Sta. 01* | <0.0025 | 0.01 | <0.35 | 12.1 | <0.023 | 0.9 | One fiber of amosite detected. |
| 7/20/2020 | CHMB02-AB02-0720 | Sta. 02* | <0.0025 | 0.01 | <0.34 | 12.1 | -- | -- | |
| 7/20/2020 | CHMB02-AB03-0720 | Sta. 03 | <0.0025 | 0.01 | <0.34 | 12.1 | -- | -- | One fiber of amosite detected. |
| 7/20/2020 | CHMB02-AB04-0720 | Sta. 04* | <0.0026 | 0.01 | <0.35 | 12.1 | -- | -- | One fiber of chrysotile and one non-asbestos structure detected. |
| 7/20/2020 | CHMB02-AB05-0720 | Sta. Koppers | <0.0026 | 0.01 | <0.35 | 12.1 | -- | -- | One fiber of chrysotile and one non-asbestos structure detected. |
| 7/20/2020 | CHMB02-AB06-0720 | Sta. Residence | <0.0026 | 0.01 | <0.35 | 12.1 | -- | -- | |
| 7/20/2020 | CHMB02-PM-LJS-0720 | Personal | <0.0025 | 0.01 | <0.34 | 12.1 | -- | -- | |
| 7/20/2020 | CHMB02-AB-0720-FBO1 | Field Blank (open) | NA | NA | NA | NA | -- | -- | |
| 7/20/2020 | CHMB02-AB-0720-FBO2 | Field Blank (open) | NA | NA | NA | NA | -- | -- | |
| 7/20/2020 | CHMB02-AB-0720-FBC1 | Field Blank (closed) | NA | NA | NA | NA | -- | -- | |
| 7/20/2020 | CHMB02-AB-0720-FBC2 | Field Blank (closed) | NA | NA | NA | NA | -- | -- | |
| | | | | | | | | | |
| 7/21/2020 | CHMB02-AB01-0721 | Sta. 01* | <0.0033 | 0.01 | <0.45 | 12.1 | 0.065 | 0.9 | One non-asbestos structure detected. |
| 7/21/2020 | CHMB02-AB02-0721 | Sta. 02* | <0.0033 | 0.01 | <0.46 | 12.1 | -- | -- | |
| 7/21/2020 | CHMB02-AB03-0721 | Sta. 03 | <0.0032 | 0.01 | <0.43 | 12.1 | -- | -- | Two non-asbestos structures detected. |
| 7/21/2020 | CHMB02-AB04-0721 | Sta. 04* | <0.0033 | 0.01 | <0.43 | 12.1 | -- | -- | |
| 7/21/2020 | CHMB02-AB05-0721 | Sta. Koppers | <0.0032 | 0.01 | <0.39 | 12.1 | -- | -- | 0.5 chrysotile fiber and 1.5 non-asbestos structures detected. |
| 7/21/2020 | CHMB02-AB06-07121 | Sta. Residence | <0.0034 | 0.01 | <0.46 | 12.1 | -- | -- | One non-asbestos structure detected. |
| 7/21/2020 | CHMB02-PM-KLC-0721 | Personal | <0.0033 | 0.01 | <0.45 | 12.1 | -- | -- | |
| 7/21/2020 | CHMB02-AB-0721-FBO1 | Field Blank (open) | NA | NA | NA | NA | -- | -- | |
| 7/21/2020 | CHMB02-AB-0721-FBO2 | Field Blank (open) | NA | NA | NA | NA | -- | -- | |
| 7/21/2020 | CHMB02-AB-0721-FBC1 | Field Blank (closed) | NA | NA | NA | NA | -- | -- | |
| 7/21/2020 | CHMB02-AB-0721-FBC2 | Field Blank (closed) | NA | NA | NA | NA | -- | -- | |
| | | | | | | | | | |
| 7/22/2020 | - | Sta. 01 | - | 0.01 | - | 12.1 | -- | -- | No air monitoring - no earthmoving work in the exclusion zone. |
| 7/22/2020 | - | Sta. 02 | - | 0.01 | - | 12.1 | -- | -- | |
| 7/22/2020 | - | Sta. 03 | - | 0.01 | - | 12.1 | -- | -- | |
| 7/22/2020 | - | Sta. 04 | - | 0.01 | - | 12.1 | -- | -- | |
| 7/22/2020 | - | Sta. Koppers | - | 0.01 | - | 12.1 | -- | -- | |
| 7/22/2020 | - | Sta. Residence | - | 0.01 | - | 12.1 | -- | -- | |
| 7/22/2020 | - | Personal | - | 0.01 | - | 12.1 | -- | -- | |
| 7/22/2020 | - | Field Blank (open) | - | NA | - | NA | -- | -- | |
| 7/22/2020 | - | Field Blank (open) | - | NA | - | NA | -- | -- | |
| 7/22/2020 | - | Field Blank (closed) | - | NA | - | NA | -- | -- | |
| 7/22/2020 | - | Field Blank (closed) | - | NA | - | NA | -- | -- | |
| | | | | | | | | | |
| 7/23/2020 | - | Sta. 01 | - | 0.01 | - | 12.1 | -- | -- | No air monitoring - no earthmoving work in the exclusion zone. |
| 7/23/2020 | - | Sta. 02 | - | 0.01 | - | 12.1 | -- | -- | |
| 7/23/2020 | - | Sta. 03 | - | 0.01 | - | 12.1 | -- | -- | |
| 7/23/2020 | - | Sta. 04 | - | 0.01 | - | 12.1 | -- | -- | |
| 7/23/2020 | - | Sta. Koppers | - | 0.01 | - | 12.1 | -- | -- | |
| 7/23/2020 | - | Sta. Residence | - | 0.01 | - | 12.1 | -- | -- | |
| 7/23/2020 | - | Personal | - | 0.01 | - | 12.1 | -- | -- | |
| 7/23/2020 | - | Field Blank (open) | - | NA | - | NA | -- | -- | |
| 7/23/2020 | - | Field Blank (open) | - | NA | - | NA | -- | -- | |
| 7/23/2020 | - | Field Blank (closed) | - | NA | - | NA | -- | -- | |
| 7/23/2020 | - | Field Blank (closed) | - | NA | - | NA | -- | -- | |
| | | | | | | | | | |
| 7/24/2020 | CHMB02-AB01-0724 | Sta. 01* | <0.0029 | 0.01 | <0.39 | 12.1 | 0.035 | 0.9 | One non-asbestos structure detected. |
| 7/24/2020 | CHMB02-AB02-0724 | Sta. 02* | <0.003 | 0.01 | <0.43 | 12.1 | -- | -- | |
| 7/24/2020 | CHMB02-AB03-0724 | Sta. 03 | <0.0029 | 0.01 | <0.40 | 12.1 | -- | -- | |
| 7/24/2020 | CHMB02-AB04-0724 | Sta. 04* | <0.0028 | 0.01 | <0.38 | 12.1 | -- | -- | One non-asbestos structure detected. |
| 7/24/2020 | CHMB02-AB05-0724 | Sta. Koppers | <0.0029 | 0.01 | <0.40 | 12.1 | -- | -- | |
| 7/24/2020 | CHMB02-AB06-0724 | Sta. Residence | <0.0031 | 0.01 | <0.38 | 12.1 | -- | -- | One non-asbestos structure detected. |
| 7/24/2020 | CHMB02-PM-LJS-0724 | Personal | <0.0029 | 0.01 | <0.39 | 12.1 | -- | -- | |
| 7/24/2020 | CHMB02-AB-0724-FBO1 | Field Blank (open) | NA | NA | NA | NA | -- | -- | |
| 7/24/2020 | CHMB02-AB-0724-FBO2 | Field Blank (open) | NA | NA | NA | NA | -- | -- | |
| 7/24/2020 | CHMB02-AB-0724-FBC1 | Field Blank (closed) | NA | NA | NA | NA | -- | -- | |
| 7/24/2020 | CHMB02-AB-0724-FBC2 | Field Blank (closed) | NA | NA | NA | NA | -- | -- | |
| | | | | | | | | | |
| 7/25/2020 | - | Sta. 01* | - | 0.01 | - | 12.1 | -- | -- | No air monitoring - earthmoving work in the exclusion zone was complete. |
| 7/25/2020 | - | Sta. 02* | - | 0.01 | - | 12.1 | -- | -- | |
| 7/25/2020 | - | Sta. 03 | - | 0.01 | - | 12.1 | -- | -- | |
| 7/25/2020 | - | Sta. 04* | - | 0.01 | - | 12.1 | -- | -- | |
| 7/25/2020 | - | Sta. Koppers | - | 0.01 | - | 12.1 | -- | -- | |
| 7/25/2020 | - | Sta. Residence | - | 0.01 | - | 12.1 | -- | -- | |
| 7/25/2020 | - | Personal | - | 0.01 | - | 12.1 | -- | -- | |
| 7/25/2020 | - | Field Blank (open) | - | NA | - | NA | -- | -- | |
| 7/25/2020 | - | Field Blank (open) | - | NA | - | NA | -- | -- | |
| 7/25/2020 | - | Field Blank (closed) | - | NA | - | NA | -- | -- | |
| 7/25/2020 | - | Field Blank (closed) | - | NA | - | NA | -- | -- | |

Notes:
f/cc = fibers per cubic centimeter
NA = Not analyzed or not applicable
TEM = Transmission electron microscopy
$mg/m^3$ = milligram per cubic meter
$ug/m^3$ = microgram per cubic meter

Created by: LJS 090120
Checked by: KLC 090220

* Indicates the air monitoring sampling station locations were changed to match the locations noted as the 2020 air monitoring stations on Figure 3.

## FIGURES





**Legend**

Property Boundary

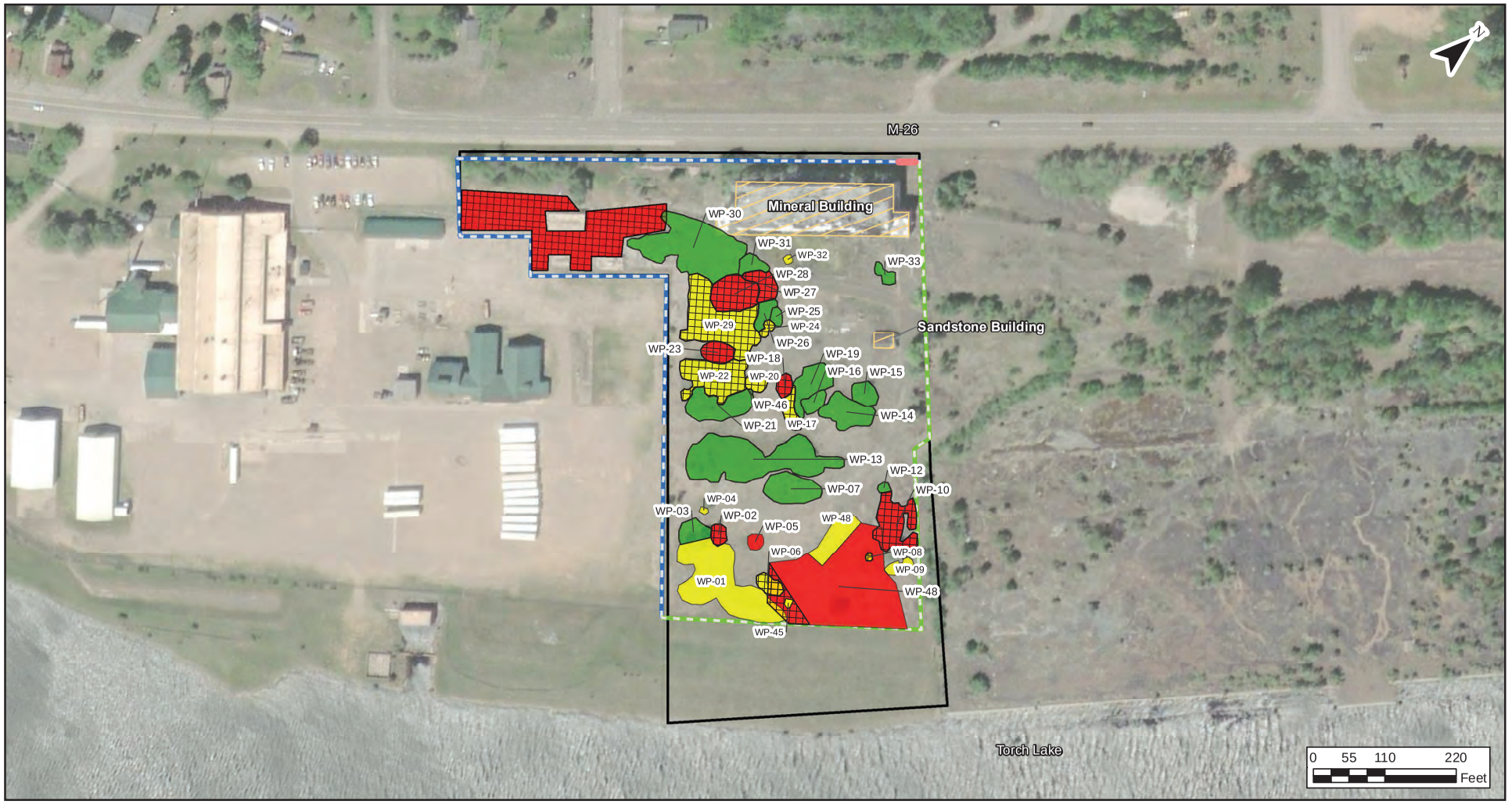
Mineral Building
Torch Lake Area of Concern

**SITE LOCATION MAP**

Honeywell EPA

| | | |
|---|---|---|
| Prepared by: DGJ 5/4/2021<br>Checked by: LS 5/4/2021<br>Project Number: 3293191868 | wood. | FIGURE 1 |

G:\Honeywell\a_MXD\Torch Lake\ConstructionReport_2021\Fig_1_SiteLocation.mxd 1/27/2021 9:41:33 AM





**Legend**

- Non-Regulated Material
- Characteristic Non Hazardous Waste Pile
- Characteristic Hazardous Waste Pile
- Waste Pile with ACM
- Property Boundary
- Existing Fence
- Fence Installed 2018
- Access Gate
- Mineral Building & Sandstone Building

Notes:
Source: Tetra Tech Removal Assessment Report, January 2018

Base Map Source: ESRI Imagery Basemap

Mineral Building
Torch Lake Area of Concern

SITE FEATURES

Honeywell EPA

Prepared by: DGJ 6/7/2021
Checked by: LS 6/7/2021
Project Number: 329319186

wood.

FIGURE 2

G:\Honeywell\a_MXD\Torch Lake\ConstructionReport_2021\WasteCharacterization2.mxd 5/3/2021 8:58:55 AM



**Legend**

- Contractor Decontamination Pad
- Contractor Laydown and Staging
- Non-Hazardous Material Staging
- Non-Hazardous Material with Asbestos Staging Area
- Non-Regulated Material Consolidation Pile
- Property Boundary
- 2019 Air Monitoring
- 2019/2020 Air Monitoring
- 2020 Air Monitoring
- Limits Of Work
- Access Gate
- Mineral Building & Sandstone Building
- Waste Piles

Notes:
Source: Tetra Tech Removal Assessment Report, January 2018

Base Map Source: ESRI Imagery Basemap

Mineral Building
Torch Lake Area of Concern

**CONSTRUCTION FEATURES**

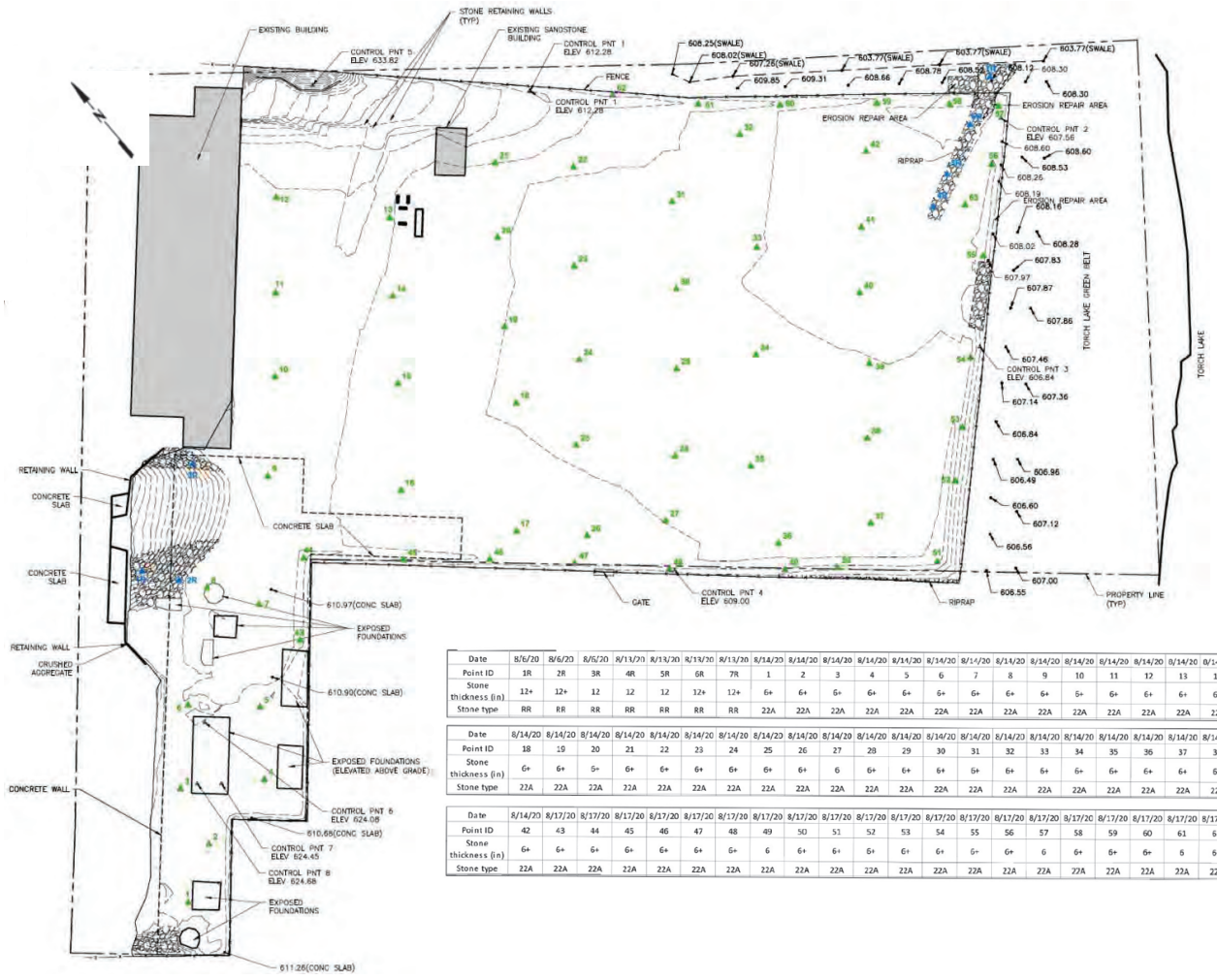
Honeywell EPA

Prepared by: MSC 5/4/2021
Checked by: LS 5/4/2021
Project Number: 329319868

wood.

FIGURE 3

G:\Honeywell\a_MXD\Torch Lake\ConstructionReport_2021\ContractorControl_and_LaydownArea.mxd 1/27/2021 10:32:51 AM




| Date | 8/6/20 | 8/6/20 | 8/5/20 | 8/13/20 | 8/13/20 | 8/13/20 | 8/13/20 | 8/14/20 | 8/14/20 | 8/14/20 | 8/14/20 | 8/14/20 | 8/14/20 | 8/14/20 | 8/14/20 | 8/14/20 | 8/14/20 | 8/14/20 | 8/14/20 | 8/14/20 | 8/14/20 | 8/14/20 | 8/14/20 | 8/14/20 | 8/14/20 | 8/14/20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Point ID | 1R | 2R | 3R | 4R | 5R | 6R | 7R | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| Stone thickness (in) | 12+ | 12+ | 12 | 12 | 12 | 12+ | 12+ | 6+ | 6+ | 6+ | 6+ | 6+ | 6+ | 6+ | 6+ | 6+ | 6+ | 6+ | 6+ | 6+ | 6+ | 6+ | 6+ | 6+ | 6+ | 6+ |
| Stone type | RR | RR | RR | RR | RR | RR | RR | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A |

| Date | 8/14/20 | 8/14/20 | 8/14/20 | 8/14/20 | 8/14/20 | 8/14/20 | 8/14/20 | 8/14/20 | 8/14/20 | 8/14/20 | 8/14/20 | 8/14/20 | 8/14/20 | 8/14/20 | 8/14/20 | 8/14/20 | 8/14/20 | 8/14/20 | 8/14/20 | 8/14/20 | 8/14/20 | 8/14/20 | 8/14/20 | 8/14/20 | 8/14/20 | 8/14/20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Point ID | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 |
| Stone thickness (in) | 6+ | 6+ | 5+ | 6+ | 6+ | 6+ | 6+ | 6+ | 6+ | 6 | 6+ | 6+ | 6+ | 6+ | 6+ | 6+ | 6+ | 6+ | 6+ | 6+ | 6+ | 6+ | 6+ | 6+ | 6+ | 6+ |
| Stone type | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A |

| Date | 8/14/20 | 8/17/20 | 8/17/20 | 8/17/20 | 8/17/20 | 8/17/20 | 8/17/20 | 8/17/20 | 8/17/20 | 8/17/20 | 8/17/20 | 8/17/20 | 8/17/20 | 8/17/20 | 8/17/20 | 8/17/20 | 8/17/20 | 8/17/20 | 8/17/20 | 8/17/20 | 8/17/20 | 8/17/20 | 8/17/20 | 8/17/20 | 8/17/20 | 8/17/20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Point ID | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | | | | |
| Stone thickness (in) | 6+ | 6+ | 6+ | 6+ | 6+ | 6+ | 6+ | 6 | 6+ | 6+ | 6+ | 6+ | 6+ | 6+ | 6+ | 6 | 6+ | 6+ | 6+ | 6 | 6+ | 6+ | | | | |
| Stone type | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A | 22A | | | | |

## NOTES

1. TOPOGRAPHIC SURVEY DATED AUGUST 2020 AND PROVIDED BY COLEMAN ENGINEERING. HORIZONTAL DATUM IS MICHIGAN STATE PLANE NORTH, INTERNATIONAL FEET. VERTICAL DATUM IS NAVD 1929.
2. BOUNDARY FROM CERTIFICATE OF SURVEY PREPARED BY LUCAS S TOMASOSKI, PS 59550, DATED 5-31-2016.

0 20 40 80
SCALE IN FEET


LEGEND

- EXISTING BUILDING
- MINOR CONTOUR (1' INTERVAL)
- MAJOR CONTOUR (5' INTERVAL)
- FENCE
- PROPERTY LINE
- SURVEY CONTROL POINT
- SLOPE/DITCH PROTECTION
- 608.30 SPOT GRADES PROVIDED FROM PREVIOUS SURVEY (NOT UPDATED DURING AS-BUILT SURVEY)
- x 610.3 EXISTING SPOT GRADE
- 1 22A GRAVEL
- 3R RIPRAP

TYP TYPICAL
PNT POINT
ELEV ELEVATION

Mineral Building
Torch Lake Area of Concern

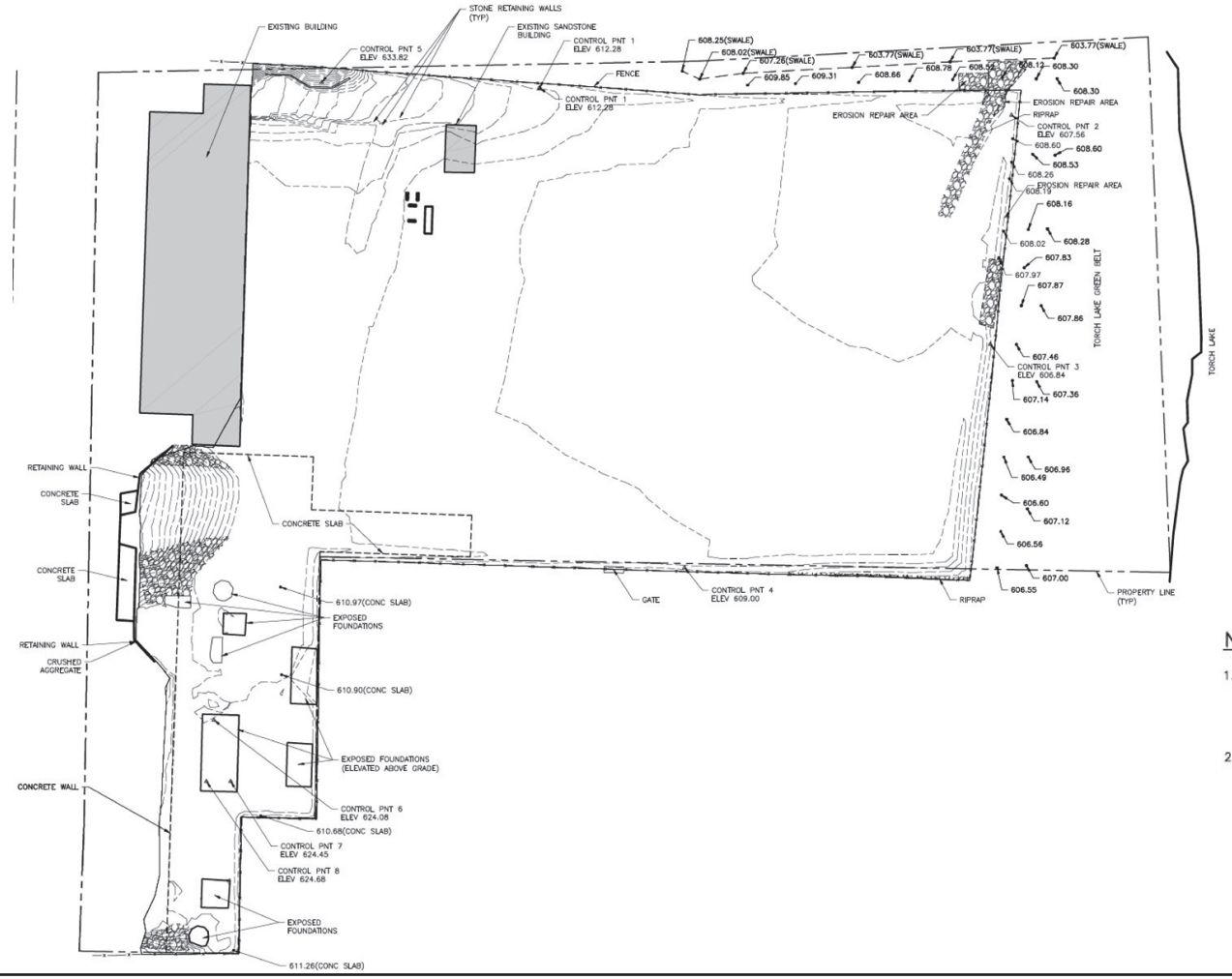
**GRAVEL THICKNESS QUALITY ASSURANCE MEASUREMENTS**

Honeywell EPA

| | |
|---|---|
| Prepared by: DGJ 6/24/2021 | wood. |
| Checked by: LS 6/24/2021 | |
| Project Number: 329319868 | |

FIGURE 4

G:\Honeywell\a_MXD\Torch Lake\ConstructionReport_2021\ThicknessFINAL.mxd 6/23/2021 3:23:02 PM




## NOTES

1. TOPOGRAPHIC SURVEY DATED AUGUST 2020 AND PROVIDED BY COLEMAN ENGINEERING. HORIZONTAL DATUM IS MICHIGAN STATE PLANE NORTH, INTERNATIONAL FEET. VERTICAL DATUM IS NAVD 1929.
2. BOUNDARY FROM CERTIFICATE OF SURVEY PREPARED BY LUCAS S TOMASOSKI, PS 59550, DATED 5-31-2016.

0 20 40 80
SCALE IN FEET


## LEGEND

- EXISTING BUILDING
- MINOR CONTOUR (1' INTERVAL)
- MAJOR CONTOUR (5' INTERVAL)
- FENCE
- PROPERTY LINE
- SURVEY CONTROL POINT
- SLOPE/DITCH PROTECTION
- 608.30 — SPOT GRADES PROVIDED FROM PREVIOUS SURVEY (NOT UPDATED DURING AS-BUILT SURVEY)
- X 610.3 — EXISTING SPOT GRADE

| | |
|---|---|
| TYP | TYPICAL |
| PNT | POINT |
| ELEV | ELEVATION |

Mineral Building
Torch Lake Area of Concern

**FINAL SITE TOPOGRAPHIC SURVEY**

Honeywell EPA

| | |
|---|---|
| Prepared by: DGJ 6/24/2021 | |
| Checked by: LS 6/24/2021 | wood. |
| Project Number: 329319868 | FIGURE 5 |

G:\Honeywell\a_MXD\Torch Lake\ConstructionReport_2021\SiteSurveyFINAL.mxd 6/24/2021 11:40:59 AM

# APPENDIX A

## Photographic Log

**APPENDIX A**
**PHOTOGRAPHIC LOG**
Calumet & Hecla Mineral Building Site
Torch Lake Township, Michigan


June 2016 Aerial photo of Site (facing west) from Google Earth

**APPENDIX A**
**PHOTOGRAPHIC LOG**
Calumet & Hecla Mineral Building Site
Torch Lake Township, Michigan


**Mineral Building (facing west) 2019**

**Mineral Building (facing Northeast) 2019**

**APPENDIX A**
**PHOTOGRAPHIC LOG**
Calumet & Hecla Mineral Building Site
Torch Lake Township, Michigan


**Stack Debris, prior to EnviroBlend® treatment and removal (facing west) 2019**


**Waste piles prior to removal (facing South) 2019**

**APPENDIX A**
**PHOTOGRAPHIC LOG**
Calumet & Hecla Mineral Building Site
Torch Lake Township, Michigan


**Waste piles prior to EnviroBlend® treatment and removal (facing Northeast) 2019**

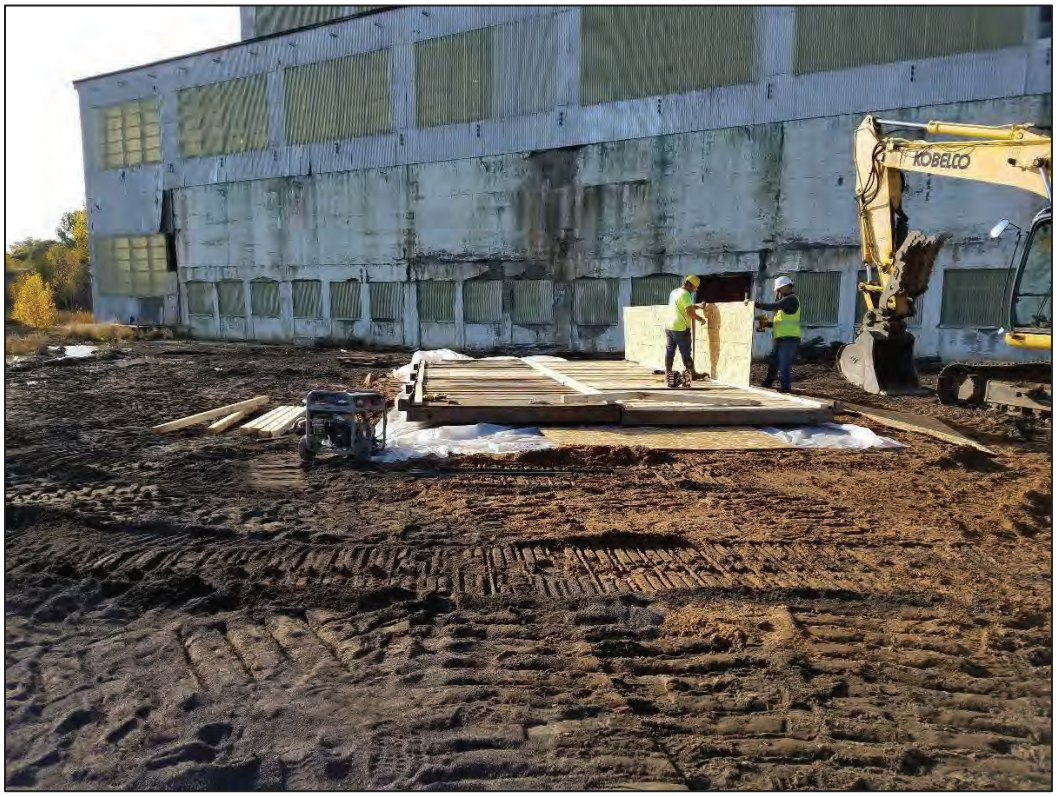

**Waste Pile 48 prior to EnviroBlend® treatment and removal (facing East). 2019**

**Soil Erosion and Sediment Control (SESC) Plan Implementation:**
**Silt Fence installment in lead contaminated area (facing Southwest) 2019**

**SESC Straw waddle placement along the fenced perimeter (facing northwest) 2019**

**APPENDIX A**
**PHOTOGRAPHIC LOG**
Calumet & Hecla Mineral Building Site
Torch Lake Township, Michigan

**Spray painted waste piles (facing South) 2019**




**Decontamination pad construction (facing West) 2019**

**APPENDIX A**
**PHOTOGRAPHIC LOG**
Calumet & Hecla Mineral Building Site
Torch Lake Township, Michigan

**Consolidating non-Regulated waste piles (facing north) 2019**

**Haul road construction (facing Southwest to Northwest) 2019**

**Non-regulated material consolidation area (facing West) 2019**

**Dust suppression in the Stack Debris area (facing south) 2019**


**EnviroBlend® delivery and unloading (facing northwest) 2019**

**EnviroBlend® staging area (facing North) 2019**


**Moving WP-01 to non-hazardous staging/load out area (facing east) 2019**

**Non-hazardous material staging/load out area (facing Southeast) 2019**

**Covered non-hazardous with asbestos soil staging/load out area (facing Southeast) 2019**

**Lined truck being loaded with non-hazardous with asbestos material to be hauled to the landfill (facing South) 2019**

**Sealing truck loaded with non-hazardous with asbestos material(facing East) 2019**


**Mixing EnviroBlend® into portion of WP-48 (facing East) 2019**

**Stack Debris area after substantial debris removal (facing Southwest) 2019**

**Load of sand delivered and placed in former WP-48 excavation (facing South) 2019**

**View of site after waste pile removal completion (facing east) 2019**

**View of site after waste pile removal completion (facing North) 2019**

**APPENDIX A**
**PHOTOGRAPHIC LOG**
Calumet & Hecla Mineral Building Site
Torch Lake Township, Michigan

**View of Mineral Building (facing north) at start of July 2020 mobilization**

**Aerial view of the site (facing west-northwest) at start of July 2020 mobilization**

**Prepare for final cleanup of the Stack Debris Area (facing south), repair exclusion zone delineation 2020**

**Air monitoring sample station on the south fence adjoining Koppers (facing southwest) 2020**

**Filtering collected decontamination water (facing west) 2020**

**Aerial of site (facing south) as the demarcation fabric roll out and sand cover begins**

**Importing sand as general fill over the demarcation fabric (facing northeast) 2020**

**Cleaning elevated foundation using the "dead stick" excavator as a tie off (facing southeast) 2020**

**Elevated foundations in the Stack Debris area cleaned (facing south) 2020**

**Stack Debris area material stockpiled, treated, sampled and covered awaiting disposal (facing west) 2020**


**Hazardous Material from the stack bases has been stockpiled and covered awaiting disposal (facing south) 2020**


**Load out hazardous material from the stack bases at the entrance to the site (facing north) 2020**

**Panorama of haul road and east portion of the Site after a rain storm (facing southeast to south) 2020**

**Washing Stack Debris Area where non-hazardous material with asbestos and EnviroBlend® was staged (facing southwest) 2020**

**Steel secured at Mineral Building doorways to hold fill out of the building (facing north) 2020**


**Final load of non-hazardous material with asbestos and EnviroBlend being sealed prior to leaving the Site (facing southeast) 2020**


**Place sand over demarcation fabric in the Stack Debris area (facing northeast) 2020**

**Pushing out delivered 22A gravel over the compacted sand (facing east)**

**Placing riprap over geotextile fabric on the slope greater than 3 to 1 on the consolidation pile (facing west) 2020**

**Forming the perimeter berm in the subgrade (facing north-northeast) 2020**

**Repairing bulldozer tear in the demarcation fabric (facing northwest) 2020**

**Sand placed and much of the 22A placed on the Site (panorama facing southeast to south) 2020**


**Constructing a swale in the eastern corner of the Site (facing east) 2020**

**The Site swale construction nearly complete (facing southwest) 2020**


**Completing 22A thickness quality control checks (facing south) 2020**


**Placing riprap over geotextile fabric on the slope at the southwest corner of the Stack Debris area (facing west) 2020**

**Placing riprap along the south fence line near the southeast corner of the site (facing southeast) 2020**

**Base of the consolidation pile with final riprap (facing east) 2020**

**Final grading of the Site (facing south) 2020**

**Aerial photo after demobilization; restoration complete (facing west)**

**APPENDIX A**
**PHOTOGRAPHIC LOG**
Calumet & Hecla Mineral Building Site
Torch Lake Township, Michigan

**Erosion issue documented by EGLE on 10/08/2020 (facing southwest)**

**Erosion repair by Silver Shore on 10/13/2020 (facing east)**

**Erosion issue documented by EGLE on 10/08/2020 (facing north)**

**Erosion repair by Silver Shore on 10/13/2020 (facing northeast)**

**APPENDIX A**
**PHOTOGRAPHIC LOG**
Calumet & Hecla Mineral Building Site
Torch Lake Township, Michigan

**Erosion issue documented by EGLE on 10/20/2020 (facing northwest)**

**Erosion repair by Silver Shore on 10/29/2020 (facing east-northeast)**