

Prepared for:
TBAISD and AK Steel

Due Care Plan for TBA Career Technical Center

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1.0 Introduction

Section 20107a of Part 201 of Michigan Natural Resources and Environmental Protection Act 451 of 1994, as amended (NREPA, 1994 PA, 451), hereafter referred to as “Section 7a”, and the related regulatory rules promulgated pursuant to Section 7a in MAC R 299.51001 et seq, commonly referred to as the “Due Care” rules, set forth certain requirements for owners and operators of property that meet the Part 201 definition of “facility”. For purposes of this Due Care Plan, Section 7a and the Due Care rules are collectively referred to as the “due care requirements”.

The due care requirements require that such property owners and operators take due care measures to ensure that existing contamination on a property does not cause unacceptable risks and is not exacerbated. Specifically, the requirements with respect to hazardous substances include measures to:

- Prevent exacerbation of the existing contamination.
- Prevent unacceptable human exposure and mitigate fire and explosion hazards to allow for the intended use of the facility in a manner that protects the public health and safety.
- Take reasonable precautions against the reasonably foreseeable acts or omissions of a third party.
- Provide cooperation and access to persons authorized to conduct response activities at the facility.
- Comply with any land use or resource use restrictions and do not impede the effectiveness or integrity of any restrictions employed.
- Provide notifications to the Michigan Department of Environmental Quality (DEQ) and others.

This Due Care Plan (“Plan”) presents required information to document compliance with the due care requirements for the Traverse Bay Area Career Technical Center property (hereafter designated “TBA Property”) located at 880 Parsons Road (formerly 2902 Parsons Road), in Traverse City, Grand Traverse County, Michigan. The TBA Property is part of the Pine Grove Subdivision Facility, which is a “facility” as defined by Part 201. **Figure 1-1** shows the TBA Property, as well as other areas within the Pine Grove Subdivision Facility. This Plan is completed on behalf of the Traverse Bay Area Intermediate School District (TBAISD), owner of the TBA Property. This Plan supersedes the previous Due Care Plan for the TBA Property issued in 2009 (“2009 Due Care Plan”).

The TBA Property consists of an approximately 22.5-acre property with a main school building, various out-buildings, associated parking lots and driveways, and surrounding grounds (greenspace). The property is located in an area of commercial/industrial properties in the eastern portion of Traverse City, MI, and is zoned in the Government/Public District. The current vocational school has been in operation since 1976. The TBA Property has been developed since the 1940s, with Parsons Corporation operating manufacturing operations on the property from 1952 to 1971.

The presence of hazardous substances in the groundwater and soil at the site at concentrations above Michigan’s Part 201 Generic Residential Cleanup Criteria (GRCC) confirm that the TBA Property is part of a “facility” as defined by Part 201.

Several activities have been implemented at the TBA Property over the years that have actively addressed areas of environmental concern. These activities included:

- Excavation, removal, and disposal of contaminated soil;
- Removal and associated remediation (where necessary) of USTs;
- Installation, operation, and maintenance of a soil vapor extraction (SVE) system from 1996 to 2001 to remediate volatile organic compounds (VOCs) in soil;
- Implementation of improved waste management practices in keeping with current regulations regarding waste materials;

- Execution of a field Bioremediation Pilot Study for treating groundwater from January 2007 through March 2008; and,
- Installation and operation of two In-situ Air Sparge (IAS) remediation systems for treating groundwater and an area-specific Soil Vapor Extraction (SVE) system since September 2011.

A Remedial Action Plan ("RAP"; AECOM, 2012) was approved by the Michigan Department of Environmental Quality (MDEQ) in September 2012. The RAP presented proposed (and continuing) remedial actions for the Pine Grove Subdivision Facility, including the TBA Property. These remedial actions address concentrations of chlorinated VOCs (CVOCs) and inorganic constituents found in environmental media that were identified in historical and recent investigations as being above applicable MDEQ land use based cleanup criteria.

The remedial actions detailed in the RAP included:

- Continued operation and maintenance of IAS groundwater treatment systems installed in 2011 in two areas on the Traverse Bay Area (TBA) Property along the boundary with the Pine Grove Subdivision (PGS) affected area (PGS Area), optimization of the systems operations if needed, and continued monitoring of performance;
- Continued operation and maintenance of a limited SVE treatment system installed in 2011 in one area on the TBA Property, optimization of the system operation if needed, and continued monitoring of performance;
- Monitored natural attenuation on the remainder of the TBA Property;
- Monitored natural attenuation of groundwater in the PGS Area and groundwater surface water interface (GSI) boundary area;
- Continued GSI discharge compliance monitoring in the GSI Area;
- Additional groundwater compliance monitoring in select areas along the northern TBA Property boundary and in adjacent downgradient areas;
- Monitoring of soil gas on the TBA Property;
- Maintaining the footprint of the main TBA building and several large paved areas as a barrier to infiltration and exposure on the TBA Property;
- A restrictive covenant for the TBA Property; and
- "Alternate" land use control notification/monitoring activities in the PGS Area.

The Pine Grove Subdivision Facility is a very low risk site. Levels of CVOCs in groundwater have reduced over time and groundwater treatment systems are in place and operating to further reduce CVOCs in groundwater. The areas within the Facility are supplied with municipal water, groundwater is not used for drinking and there are no residential wells in use. Various controls are in place to prevent future use of groundwater for drinking and to prevent other potential exposures.

Information used in this Plan includes data from previous site investigations as documented in the RAP and from continued monitoring in 2012-2013.

The remainder of this Plan is organized as follows:

- Section 2.0 provides detailed characteristics of property use.
- Section 3.0 outlines information about hazardous substances to which persons may be exposed
- Section 4.0 presents a plan for response activities necessary to satisfy due care requirements.
- Section 5.0 presents summary information to demonstrate compliance with the due care requirements.

2.0 Detailed Characteristics of Property Use

The following section presents an overview of current, past, and future land use of the TBA property.

2.1 Current Use and Site Conditions

In June 1976, TBAISD purchased the TBA Property for the purpose of operating a vocational school; the TBA Career Technical Center (CTC) school classes began in the fall of 1976. Over the years, the CTC has offered a variety of areas of study including skilled trades, manufacturing technology, information technology, cosmetology, and agriscience. The CTC has used solvents, including chlorinated solvents, in connection with various educational programs, including its automotive technology activities.

Figure 2-1 provides a detailed site map. For additional details related to current operations and activities on the TBA Property refer to Appendix 1.1-B of the RAP.

2.2 Past Owners and Land Use

The TBA Property was owned by Parsons Corporation (Parsons) from 1948 until 1973. From 1952 to 1971, Parsons operated a manufacturing operation on the TBA Property. Parsons manufacturing processes included, among others, metal cleaning and bonderizing, metalworking, cutting and shaping, painting, tube fabrication, and manufacture of helicopter blades. The manufacturing operations may have also included metal plating operations; however, various historical records present conflicting information as to whether plating was conducted. Parsons is reported to have used VOCs in the form of solvents between 1952 and 1971. Manufacturing operations ceased in 1971.

Solvents (acetone, methyl ethyl ketone (MEK), toluol, and apparently chlorinated solvents), resins, glues, and acid and alkaline cleaners (e.g., solutions containing sulfuric acid-sodium dichromate wash, Oakite 24 Alkali wash, Oakite 36 acid etch, Alkalume No. 13, Wyandotte Mil Etch) were reported to have been used and/or disposed of at the Parsons operation.

In 1968, HITCO bought Parsons. Manufacturing operations continued on the TBA Property until 1971. In 1969, Armco Steel Corporation, a subsidiary of Armco Inc., acquired HITCO. Note: In 1999, AK Steel Corporation acquired Armco Inc.

In 1973, the TBA Property was sold to the Traverse Bay Area Industrial Fund, Inc., which leased the property for various purposes, and then sold the property to TBAISD in June 1976.

2.3 Proposed Future Land Use

The future use of the site is expected to remain consistent with the current use, i.e., a school zoned under the Government/Public District of the City of Traverse City. As such, the expected activity patterns at the TBA Property are consistent with the exposure assumptions used to calculate the applicable site cleanup criteria defined in the RAP. Furthermore, the land use contemplated is permitted with the current zoning categories, and there are no potential land uses inconsistent with the exposure scenarios of the applicable criteria. The main school building and large parking areas will be maintained as infiltration and presumptive exposure barriers, therefore demolition of these structures (without replacement) will be prohibited; see Section 4.1.2 below for further information.

3.0 Hazardous Substance Information

There are various hazardous substances which a person may potentially be exposed to at the TBA Property. This section provides a brief overview of the pathway evaluation, criteria analysis, soil and groundwater characteristics, organic and inorganic constituents of concern, and fire and explosion potential for the TBA Property.

3.1 Pathway Evaluation

As detailed in the RAP, an analysis has been conducted to determine which pathways, risks, and conditions, per Part 201 rules, are relevant to the TBA Property. Table 4.1-1 of the RAP (copy included in this Plan) provides the exposure pathway analysis for the TBA Property, and includes the rationale for which pathways are relevant to the TBA Property, which generic criteria apply (if applicable), and/or the site-specific criteria that have been calculated (if applicable).

3.2 Cleanup Criteria

The land-use based cleanup category for the TBA Property is Limited Residential (reference: MCL 20120a(1)(c) (2010) of NREPA); thus the Residential Part 201 criteria have been used to evaluate that portion of the Facility.

For the TBA Property, the applicable soil criteria (as discussed in Table 4.1-1) are:

- Drinking Water Protection Criteria (DWPC)
- Groundwater-Surface Water Interface Protection Criteria (GSIPC)
- Groundwater Contact Protection Criteria (GCPC)
- Soil Volatilization to Indoor Air Inhalation Criteria (SVIIC)
- Infinite Source Volatile Soil Inhalation Criteria (VSIC) (ambient air)
- Particulate Soil Inhalation Criteria (PSIC) (ambient air)
- Direct Contact Criteria (DCC)

Of the relevant soil exposure pathways, only the DWPC and the GSIPC have shown exceedances¹. All of the other pathways evaluated, specifically the GCPC, SVIIC, DCC, VSIC and PCIC for ambient air have no exceedances; thus indicating that soil on the TBA Property does not pose a potential risk for these potential exposure pathways. (Note: The specific numerical criteria for soil can be found in Table 4.1-3 of the RAP.)

For the TBA Property, the applicable groundwater criteria are:

- Groundwater Surface Water Interface (GSI) Criteria (GSIC)
- Residential and Commercial I Groundwater Volatilization to Indoor Air Inhalation Criteria (GVIIC)
- Groundwater Contact Criteria (GCC)

It should be noted that, as presented in Table 4.1-1, groundwater on the TBA Property is not compared to the Residential and Commercial I Drinking Water Criteria or the Industrial and Commercial II, III, and IV Drinking

¹ Note, due to a restrictive covenant, groundwater on the TBA Property is not and will not be used for drinking.

Water Criteria because use of groundwater water as drinking water is not considered an applicable pathway because a restrictive covenant for the property restricts the use of groundwater for drinking (see Section 4 below). The only groundwater exceedances of any applicable Part 201 criteria on the TBA Property are for the generic GSI criteria. Thus, all other pathways evaluated, specifically the GVIIC and GCC have no exceedances, thus indicating that these exposure pathways do not pose potential risk. (Note: the specific numerical criteria for groundwater can be found in Table 4.1-4 of the RAP).

The results of the criteria evaluation conducted for the RAP are summarized in Table 4.5-1 of the RAP (copy included in this Plan), which outlines the constituents detected above applicable criteria on the TBA Property. Hazardous substances in the soil and groundwater at the TBA Property include CVOCs and inorganic constituents. The following constituents have exceeded criteria on the TBA Property:

- acetic acid - groundwater
- aluminum - groundwater
- barium – groundwater
- bromomethane - soil
- chloride - groundwater
- chromium - groundwater
- cis-1,2-dichloroethene – groundwater
- cobalt - soil
- copper – groundwater
- dichloromethane - soil
- iron - groundwater
- lead - groundwater
- manganese – groundwater
- methane - groundwater
- mercury – groundwater and soil
- nitrate – groundwater
- nitrite - groundwater
- phosphorus – groundwater
- propionic acid - groundwater
- selenium - groundwater
- sodium - groundwater
- tetrachloroethene – groundwater and soil
- thallium - groundwater
- trichloroethylene - groundwater
- vanadium - groundwater
- vinyl chloride - groundwater

More detailed analysis of the criteria evaluation can be found in Section 4 of the RAP.

3.3 Soil and Groundwater Characteristics

A thorough description of Facility characteristics can be found in Section 2.0 of the RAP, including information on physical characteristics, site investigations, evaluation of potential sources of contamination, and details related to the nature and extent of organic and inorganic contamination. Brief descriptions of site characteristics are provided in the following subsections.

3.3.1 Topography and Hydrogeology

The TBA Property geology is predominantly composed of lacustrine sand and gravel deposits. These deposits range from 1 foot to over 100 feet in thickness and are comprised of pale brown to pale reddish brown fine to medium-grained sand with a measurable number of small gravel and quartz sand beds and lenses. Local bedrock units lie approximately 360 feet below ground surface (bgs) (NUS, 1991).

The subsurface hydrogeology of the Facility consists of a water table (unconfined) aquifer of sands and gravel that extends to a depth of at least 110 feet bgs and potentially deeper, underlain by clay. The elevation of the top of clay is not well known.

The unconfined aquifer has been separated into three “zones” for investigation purposes:

- a shallow zone from 5 to 35 feet bgs;
- an intermediate zone from 35 to 80 feet bgs; and
- a deep zone from 80 to over 100 feet bgs.

Boring logs indicate relative uniformity of the underlying deposits, which are primarily composed of fine to coarse grained sand. Historical depth to groundwater is approximately 12 to 18 feet bgs on the TBA Property, 15 to 17 feet bgs in the PGS Area, and 7 to 9 feet bgs in the GSI Area. Groundwater contour maps are presented in the RAP.

From the RAP, the estimated groundwater velocity is 1.2 ft/day. The main TBA building is located approximately 2,000 feet from the East Arm of Grand Traverse Bay shore, thus the calculated groundwater travel time from the TBA Property to the Bay is approximately 1,667 days or 4.5 years.

Groundwater from the TBA Property has the potential to discharge to two surface water bodies, the East Arm of Grand Traverse Bay or Mitchell Creek. Mitchell Creek is a gaining stream, that is, overall groundwater discharges to the creek (as opposed to a losing stream, whereby the water from the stream infiltrates into the ground (i.e., recharges groundwater)). Based on groundwater contours, the eastern portion of the TBA Property (e.g., east of the main TBA building) will discharge to Mitchell Creek, while the western part will discharge to the Bay (e.g., groundwater in the vicinity of the main building).

Surface water run-off in various areas on the TBA property is collected via the stormwater drainage system which drains to Mitchell Creek, while in other areas, water evapotranspires or infiltrates to the sandy soils.

3.3.2 Nature and Extent of Organic Contamination

Based on historical information and recent investigations, the nature and extent of the organic contamination at the TBA Property is well defined and is adequately characterized.

Historical analytical results indicate that groundwater was impacted by site activities. The horizontal and vertical extent of organic compounds in groundwater has been defined, and presently the only constituent that is consistently detected in areal extent is tetrachloroethene (PCE), although historically trichloroethylene (TCE) and 1,1,1-trichloroethane (TCA) were of concern. Besides PCE, other constituents in groundwater, e.g., cis-1,2-dichloroethene, methane, vinyl chloride, are periodically present in groundwater on the TBA Property (and in the nearby downgradient offsite area) as transient injected materials, by-products or daughter-products due to previous treatment of PCE with enhanced reductive dechlorination during a Bioremediation Pilot Study conducted in select areas of the TBA property. Thus, these constituents are not the result of historical activities on the TBA Property, but due to treatment of PCE itself.

Groundwater and soil sampling throughout the property has confirmed that many parts of the property are “clean”, with soil and groundwater meeting Michigan residential standards. PCE is present in some areas of the TBA Property in shallow groundwater. The current wells known to have PCE above the Michigan residential drinking water criterion in groundwater at the Facility are depicted on **Figure 3-1 and Figure 3-2**. PCE is present above the drinking water criterion in some wells upgradient of both the West and East IAS systems, in some areas downgradient of the East IAS system, and in areas east of the West IAS system (near MW-TBA-24). PCE in groundwater, if present, is found in shallow groundwater which is considered from the top of the water table (approximately 15 ft bgs) to a depth of approximately 35 ft bgs. Intermediate and deep groundwater has been shown through testing not to be impacted.

3.3.3 Nature and Extent of Inorganic Contamination

Based on historical information and recent investigations, there are a limited number of inorganic constituents that require additional discussion.

3.3.3.1 Barium, Chromium and Mercury

Investigations before 2005 at the TBA Property primarily focused on CVOCs. However, at the request of MDEQ, inorganic constituents were investigated at two potential source areas in 2005, 2006 and 2007. A background investigation for mercury and chromium in groundwater was also conducted. In addition, due to barium concentrations in groundwater in the northeastern portion of the TBA Property observed during monitoring related to the Bioremediation Pilot Study, a potential barium source area in the northeastern portion of the TBA Property was identified and further investigated. Thus, three inorganic constituents were identified as potential constituents of concern, i.e., barium, chromium (total and hexavalent), and mercury. Detailed information regarding these investigations and results and conclusions was presented in the RAP.

The current status of each of these constituents is summarized below. The nature and extent of barium in soil and groundwater is adequately defined. Elevated concentrations of barium in groundwater, as described in the RAP, are an unremediated release at the PGS Facility, as detailed in the affidavit in Appendix 1.2-B of the RAP. Therefore, no further action is planned and no response activities are proposed for barium for any portion of the Facility. However, as barium may be encountered in groundwater at the TBA Property above applicable levels, the maximum barium concentrations detected in groundwater at each location that has been sampled is provided in **Figure 3-3**.

The nature and extent of chromium in groundwater on the TBA Property is defined. Chromium has been present in groundwater for more than 40 years in the vicinity of the former Closed Lagoons, and has not migrated substantially beyond the TBA northern property border. Soil samples collected in the former Lagoons area (i.e., the chromium source area) show no continuing source of chromium to groundwater. As a result, no further investigation or monitoring activities are warranted. Per the RAP, paved surfaces in the vicinity of the former Closed Lagoons will remain paved, i.e., to maintain present conditions. Maximum total and hexavalent chromium concentrations detected in groundwater are shown in **Figures 3-4 and 3-5**, respectively.

The nature and extent of mercury in groundwater is defined, with maximum concentrations in the low part per trillion range. There are no known sources of mercury present on the TBA property, other than the expected use of mercury-containing commercial products such as switches and thermometers that are common to commercial buildings and/or schools. Given the very low observed concentrations and the slow rate of migration (if any at all) of mercury in groundwater, no further investigation or monitoring activities are warranted. The map of maximum mercury concentrations in groundwater is presented as **Figure 3-6**.

3.3.3.2 ERD/Secondary Effect Constituents

A Bioremediation Pilot Study, using enhanced reductive dechlorination (ERD) groundwater treatment, was conducted in 2007-2008, with periodic follow-up monitoring through May 2010. During the ERD process, where the aquifer geochemical conditions were altered from aerobic to anaerobic conditions, concentrations of certain constituents in groundwater increased in the area influenced by treatment. These constituents are termed secondary effects ERD constituents. Per the RAP, the following ERD constituents were monitored for four quarters in 2012-2013 groundwater sampling: chloride, iron, manganese, nitrate as N, nitrite as N, phosphorus, acetic acid, and propionic acid. During the 2012-2013 sampling, all ERD constituents except chloride, iron and manganese met criteria. **Figures 3-7 and 3-8** show the wells where these three constituents remain above criteria.

3.4 Discussion of Potential Fire or Explosion Hazards

The Flammability and Explosivity Screening Level (FESL) for methane was developed in the Part 201 criteria to provide a screening concentration in groundwater below which the potential for fire and explosion is unlikely. Groundwater concentrations of methane detected during original site characterization efforts were well below the FESLs.

However, the Bioremediation Pilot Study remediation activities at the site included in-situ treatment of the VOCs via biodegradation in three areas of the TBA Property, under which groundwater conditions were evaluated for potential FESL exceedances for methane, a secondary effect of the ERD treatment process.

Because methane concentrations in groundwater at some select wells historically exceeded the FESL of 520 ug/L due to ERD treatment, indicating some potential for fire and explosion hazard, parties with underground utilities on the property were notified in 2009 as part of the 2009 Due Care requirements. However, as the ERD Pilot Study was discontinued (and IAS treatment was implemented), it was anticipated that methane concentrations in groundwater would decrease. As required under the RAP, methane was monitored for four quarters in 2012-2013. During 2012-2013 sampling, the highest methane concentration measured in groundwater downgradient of the Pilot Study areas was 16 ug/L, confirming that methane concentrations in groundwater had decreased to levels well below the FESL of 520 ug/L.

The RAP also required monitoring of methane in soil gas to demonstrate that concentrations are below the methane soil gas screening level. According to the RAP, final compliance would be demonstrated when methane soil gas concentrations were below the methane soil gas screening level (12,500 ppmV, the ASGSC) for four quarters at ten select soil gas monitoring locations. During four quarters of soil gas sampling in 2012-2013, the highest methane value observed in the ten soil gas monitoring points was 12 ppmV. Thus, per the RAP requirements, final compliance has been demonstrated for methane in soil gas.

In addition, in the 2009 Due Care Plan, a methane concentration in soil gas above 5,000 ppmV (which is 10% of methane's Lower Explosive Limit) was defined to be an indication of a "potential fire or explosion hazard". The 2012-2013 soil gas sampling results have confirmed that methane levels in soil gas are well below this conservative definition for a potential hazard.

Given the results of groundwater and soil gas monitoring over four quarters in 2012-2013, monitoring of methane on the TBA CTC property during excavation activities is no longer required.

Sections 4.1.5 discusses the updated notification to affected utilities.

4.0 Response Activities to Comply with Due Care Requirements

This section provides details on response activities, including groundwater use restriction, infiltration/exposure barriers, soil management plan, permanent markers, dewatering management plan, a notification plan for contractors, easement holders, and the fire department and schedules. The response activities described below are designed to comply with the due care requirements, and are specific to the TBA Property. A Declaration of Restrictive Covenant has been implemented on the TBA Property that, amongst other restrictions, prevents the use of groundwater beneath the property for drinking purposes and requires maintenance of certain paved areas and the building footprint as an infiltration and exposure barrier. A copy of the Restrictive Covenant, recorded on October 8, 2012 at the Grand Traverse County Register of Deeds, is provided in Appendix A.

4.1 Groundwater Use Restriction

Hazardous substances in the soil and groundwater at the TBA Property include chlorinated VOCs and inorganic constituents. Some constituents remain in groundwater above the Michigan Part 201 generic drinking water criteria.

The Restrictive Covenant on the TBA Property prohibits the construction and use of wells or other devices to extract groundwater for consumption, irrigation, or any other purpose, except:

- Wells and other devices constructed as part of the remediation response activities; and.
- Short-term dewatering for construction purposes.

Further, since the TBA Property is within the City and has public water available, private wells are prohibited by City Code on the property.

4.2 Infiltration/Exposure Barriers

As a presumptive remedy to address undelineated potential sources beneath the main building and large paved areas on the TBA Property, the Restrictive Covenant requires TBAISD to maintain structures on the TBA Property as barriers to infiltration and exposure. These barriers include (see **Figure 4-1**):

- the existing Main school building,
- the existing North parking area,
- the existing South parking areas and driveways (which includes the existing paved area at the Former Closed Lagoons Area), and
- the existing paved circular pad in the northeast portion of the property.

More detailed descriptions of the infiltration/exposure barrier areas can be found in Exhibit 2 of the Restrictive Covenant (see Appendix A).

The following activities constitute maintenance of Infiltration Barriers at the site:

- *Routine maintenance of pavement areas:*
 - Routine inspections of the paved Infiltration/Exposure Barrier areas marked on **Figure 4-1** by CTC maintenance personnel. Throughout the year, personnel will verify that the footprint of the building remains as shown on the Figure, and will look for cracks, heaving, and alligator cracking in the pavement surface. Any cracks will be repaired using standard paving, patching and/or sealing techniques. Personnel document inspections and any repairs made in a brief inspection record provided to the TBAISD Superintendent.

- Routine maintenance of paved Infiltration/Exposure Barrier areas may also be needed (i.e., patching of frost heaves, etc.). These events will be recorded in the annual inspection record.
- *Temporary Breaching of Barriers:*
 - Temporary breaching of the Infiltration/Exposure Barriers for the purpose of access to underground utilities, remedial activities or other construction purposes is allowed. Upon completion of the activities, the barrier will be replaced to current conditions, i.e., meeting appropriate Michigan asphalt ratings for parking areas within 14 days of completion of the work. In winter, asphalt cold patch can be used as a temporary repair or the breached area can be replaced with concrete. Engineering controls must be used to prevent the infiltration of water into the soil underlying the barrier until the barrier is repaired or replaced.
 - In the event that soil beneath the barriers is excavated, it will be managed according to the soil management plan in section 4.1.3 below.
 - These activities will be documented in the construction activities checklist (see Appendix B).
- *Annual inspection of the site:*
 - A site walkover will be conducted to ensure that the building and pavement footprints remain as per that outlined in **Figure 4-1**, and to note the overall condition of the paved Infiltration/Exposure Barrier areas.
 - If appropriate, additional Infiltration/Exposure Barrier maintenance activities or actions will be recommended to TBAISD management.

4.3 Soil Management Plan

All removed soil from the TBA Property must be managed in accordance with the applicable requirements of Section 20120c of the NREPA; Part 111, Hazardous Waste Management, of the NREPA; Subtitle C of the Resource Conservation and Recovery Act, 42 U.S.C. Section 6901 et seq.; the administrative rules promulgated thereunder; and all other relevant state and federal laws.

Soil management at the TBA Property includes managing soil during excavation, storage, and relocation or disposal. **Figure 4-2** is a soil management flowchart. The flowchart should be used to determine soil management requirements for an excavation/subsurface project. The following summarizes the basic soil management requirements:

- Most excavation activities on the property will be minor in nature. Minor regrading projects which disturb soil to a depth of 12 inches or less over a small area (e.g. 20 ft x 20 ft) and which reveal no visual signs of contamination will not trigger soil management requirements, as long as the material is distributed in the immediate area. Because these “minor” projects will not significantly “relocate” the soil, no specific management practices are necessary.
- As much as possible, soils should be returned to the point of excavation. However, soil showing visible signs of contamination should not be returned to the excavation.
- Excavated soils should be stored in a secure manner, and may require cover to prevent erosion.
- A central storage area will be used for excess soil that will not be returned to the excavation or spread out in the adjacent area. Soil should be placed on and covered with polyethylene sheeting. The soil will be sampled and characterized for on-site reuse or off-site disposal.
- Contaminated soil should only be relocated to an area on the property that is “similarly contaminated” and “similarly controlled”.

- Off-site disposal of excess soil must meet state and federal regulations and the requirements of the receiving facility.

Additional soil management details can be found in the Soil Management Plan in Appendix C.

4.4 Permanent Markers

Permanent markers detailing site restrictions are installed at the north and south entrances to the TBA Property. **Figure 4-1** shows the locations of the two permanent marker signs. The permanent markers must not be removed, covered, obscured or otherwise altered. Vegetation and other materials must be kept clear of the permanent markers to assure they are visible. The permanent markers are inspected on an annual basis.

4.5 Dewatering Water Management Plan

Incidental groundwater which is collected during activities on the TBA CTC property (hereafter termed “dewatering water”) must be properly managed (i.e., cannot be discharged to the ground). Dewatering water at a Part 201 facility is regulated as a liquid industrial waste in Michigan, according to Section 324 of Part 121 of the NREPA. A “worst case” waste profile has been created for dewatering water (see Appendix D). For the TBA CTC property, it will be assumed that all dewatering water fits the existing waste profile information. Dewatering water may be analyzed and disposed of under a different waste profile on a case-by-case basis.

Management of dewatering water while on-site involves the following:

- Store in an area protected from weather, fire, physical danger and vandals.
- Keep containers closed, except when adding or removing waste.
- Prepare a manifest for disposal.

Typically, disposal of dewatering water will be through a licensed transporter to a licensed commercial industrial waste facility. Depending on the duration and nature of the project which generates dewatering water, there may be an option to discharge the water directly to the Traverse City Publicly Owned Treatment Works (POTW). The POTW has a policy against accepting groundwater, but a temporary permit may be obtained on a case-by-case basis.

4.6 Notification to Contractors, Easement Holders, and Fire Department

Worker exposure is not expected to be of concern due to contamination on the TBA property or by remedial actions associated with the Facility. Concentrations of chemicals detected in soil and groundwater collected to date are several orders of magnitude below levels set by the MDEQ to be protective of workers, including dermal contact with soil and groundwater, inhalation of volatiles from soil or groundwater, and incidental ingestion of these media.

In 2009, utility providers were notified of potential unacceptable risk due to elevated methane in groundwater at the TBA Property. Groundwater and soil gas analyses have now confirmed that methane concentrations are within acceptable ranges and do not pose a potential hazard. Therefore, an updated notice will be sent to utility providers to indicate current site requirements, which no longer include methane monitoring during excavation. The utility providers to be notified will include the City of Traverse City (water and sewer), Traverse City Light and Power (electricity), AT&T (telephone), Feyer Zylestra (fiber optic cables), and DTE Energy/MichCon (natural gas). The City of Traverse City and DTE Energy/MichCon are also easement holders on the TBA Property. A sample of the notification to be sent to utilities providers is included in Appendix E.

TBAISD will provide additional notices to utility providers having easement or other access to the property and to other potentially affected parties, if and when routine sampling shows concentrations of a chemical above levels set by the MDEQ to be protective of workers. If such notice is warranted, it will include the general nature and extent of contamination and potential unacceptable exposures.

No site activities involving potential excavation on the property will be conducted without oversight by TBAISD and/or its consultants. Further, a review of site conditions will be conducted with utilities and contract service providers prior to excavation and/or below-grade work on the TBA Property. **Figures 4-3** and **4-4**, which show active remediation areas at the Facility, will be reviewed with contractors. A Construction Activities Checklist and Environmental Information Sheet are included in Appendix B. This information must be reviewed and the checklist completed before any excavation/below-grade work activities occur on the TBA Property.

Based on current site conditions, there are no fire or explosion hazards expected on the property. In the event that additional sampling indicates a potential for a fire or explosion hazard, the TBA CTC principal or designee will notify the Fire Department of the hazard and take steps to mitigate or eliminate the hazard.

4.7 Implementation Schedule, Operation and Maintenance and Monitoring

The implementation schedule for response activities described in Section 4 is as follows:

Due Care Response Activity	Timing
Drinking Water Restriction	Implemented
Infiltration/Exposure Barriers	Implemented
Permanent Markers	Implemented
Soil Management	As necessary for subsurface work
Dewatering Water Management	As necessary for subsurface work
Notification to Easement Holders / Utilities	Upon issuance of the updated Due Care Plan. And, as needed, upon determining there is potential for unacceptable exposure to workers.
Notification to contract workers	Prior to subsurface work at the TBA Property

The operation and maintenance plan for the infiltration/exposure barriers is detailed in section 4.2 above. At this time, a monitoring plan for due care response activities is deemed unnecessary.

5.0 Evaluation and Demonstration of Compliance with Due Care Requirements

5.1 Exacerbation

Per the due care requirements, the following is a summary explanation of how and why use of the property will not exacerbate existing contamination.

No activities related to operating the property as a vocation school will be conducted at the TBA Property that may increase the severity of the impacted groundwater or lead to increased response activities or costs. As one of the liable parties for the existing contamination, TBAISD is well aware of the contamination, remediation activities, and land use restrictions.

The intended future use of the site by TBAISD will continue to be as a vocational school. No on-site activities are planned by TBAISD that would foreseeably exacerbate existing environmental impacts, except for those activities approved by MDEQ which are currently being performed or planned as part of the environmental remediation. Procedures outlined in this Plan, e.g., infiltration/exposure barrier maintenance, soil management and dewatering water management procedures, will provide adequate controls to avoid exacerbation of existing contamination.

5.2 Due Care

Per the due care requirements, the following is a summary explanation of how and why unacceptable exposures to hazardous substances do not exist or will be prevented.

Concentrations of chemicals detected in soil and groundwater collected to date are several orders of magnitude below levels set by the MDEQ to be protective of workers, including dermal contact with soil and groundwater, inhalation of volatiles from soil or groundwater, and incidental ingestion of these media.

Unacceptable exposures will be reliably prevented by the implementation of the response activities described in this Plan. These include:

- Drinking water wells are prohibited on the property. Municipal water is utilized for all drinking and non-drinking purposes.
- The main school building and major parking areas will be maintained as an infiltration/exposure barrier.
- Soils excavated on the TBA Property will be properly managed according to the Soil Management Plan.
- Permanent Markers will be maintained to provide notice to the public of site restrictions.
- No site activities involving potential excavation will be conducted without oversight by TBAISD and/or its consultants. Notification of site conditions will be made to all prospective contractors or utility easement holders prior to on-site activities.
- A notice of migration has been provided to affected adjacent property owners as required by the "Due Care" rules.

Based on these preventative measures, the pathways for exposure will be reasonably restricted for the TBA Property.

5.3 Reasonable Precautions

Per the due care requirements, the following is a summary explanation of what precautions will be taken against reasonably foreseeable acts or omissions of a third party.

Due to the location of the site along Parsons Road and its use as a vocational school, access to the TBA Property from the outside will not be completely controlled by the fencing used as a property barrier. However, through general operating procedures at the TBA Property and general maintenance, the owner will not allow any activities of third parties to take place on its property that would result in exposure to existing contamination at the subject site, without proper management and notification being made to the third parties.

Precautions that will be taken against foreseeable acts or omissions of a third party will include:

- Maintaining existing fencing around portions of the property, and restricting main building access through locked doors when school is not in session, to discourage trespassing onto the property.
- Maintaining main school building and major paved areas as a presumptive exposure barrier.
- Maintaining permanent markers which describe site restrictions.
- Notifications to utilities and contractors of the contents of this Plan and required procedures prior to performing subsurface work on the property.
- Notifications to utilities, should contaminants exceed levels acceptable for worker exposure.

Tables

Table 4.1-1: Exposure Pathway Analysis for TBA Property
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Exposure Medium/Pathway As per Rule 532(7)	Relevant Pathway (i.e., can exposure occur)?	Criteria Applicable ?	Rationale	Applicable Generic Criteria	Site-Specific Criteria (if applicable)	Rationale
Groundwater						
Risks due to hazardous substances in groundwater as a result of use of that groundwater for drinking water.	Yes	No	Restrictive Covenant for property will restrict the use of groundwater for drinking.	NA	NA	NA
Risks due to hazardous substances in groundwater as a result of dermal contact with that groundwater.	Yes	Yes	Dermal exposure to groundwater on the TBA property could occur during construction activities or maintenance work on buried utilities.	Generic Groundwater Contact Criteria (GCC)	NA	<p>These criteria provide concentrations that are protective against adverse health effects resulting from dermal exposures to hazardous substances in groundwater such as could be experienced by workers in subsurface excavations.</p> <p>The generic criteria are applicable for the TBA property because depth to groundwater is between 11 and 18 feet bgs, and utility work and/or subsurface excavation work could occur at these depths.</p> <p>As per footnote (B), and only for those chemicals noted with a (B), if background level is established for site and is greater than the GCC, the background level becomes the default screening criteria.</p> <p>As per footnote (S), if a hazardous substance has a GCC greater than its respective water solubility (water sol) limit, the GCC for that substance is equal to its water sol screening level.</p>
Risks due to hazardous substances in groundwater as a result of those hazardous substances venting to surface water.	Yes	Yes	<p>Groundwater from TBA property moves toward the PGS area, where it vents to Mitchell Creek and Grand Traverse Bay. As per a letter from DEQ dated October 8, 2010:</p> <ul style="list-style-type: none"> its review of groundwater discharges to Mitchell Creek indicates that concentrations venting to Mitchell Creek do not have the reasonable potential to exceed water quality standards. Chronic and acute mixing zone based criteria for PCE venting to Grand Traverse Bay were developed to be protective of aquatic life and human health. 	Groundwater Surface Water Interface Criteria (GSIC)	Calculated for PCE; submitted to MDEQ in Mixing Zone Determination Request	<p>Criteria provide groundwater concentrations that are protective of receiving surface water.</p> <p>It is noted that several GSIC are footnoted with an (X). This footnote is applicable to Grand Traverse Bay. The footnote indicates that the GSIC are not protective of groundwater that discharges to surface waters used as a drinking water source, or groundwater discharge to the Great Lakes and their connecting waters, in which case the human drinking water value applies (HDV). The Grand Traverse Bay is a connecting water of Lake Michigan; therefore, the HDVs apply. The point of compliance for the GSIC is the groundwater-surface water interface of the receiving water body (GSI wells</p>

Table 4.1-1: Exposure Pathway Analysis for TBA Property
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Exposure Medium/Pathway As per Rule 532(7)	Relevant Pathway (i.e., can exposure occur)?	Criteria Applicable ?	Rationale	Applicable Generic Criteria	Site-Specific Criteria (if applicable)	Rationale
						<p>have been installed along the GSI with the bay).</p> <p>As per MDEQ guidance, the generic or HDV criteria may be replaced by alternate criteria established in a mixing zone Determination (MZD). An MZD renewal request for the PCE plume was submitted to the MDEQ in 2009 and the January 15, 2010 response from MDEQ indicated that the plume should attain a chronic MZD GSIC of 60 ppb and an acute MZD GSIC of 2900 ppb for PCE in groundwater potentially venting to the Grand Traverse Bay. (In the 1/15/10 letter, MDEQ stated that the plume no longer shows the reasonable potential to exceed the acute value.)</p> <p>As per discussions with MDEQ, if groundwater concentrations upgradient of the GSI (i.e., groundwater concentrations on the TBA property) are less than the acute GSI criteria, then this pathway can be eliminated from further consideration:</p> <p>As per footnote (G), the GSIC for certain chemicals should be determined based on the pH or hardness of the receiving surface water body.</p> <p>As per footnote (B), and only for those chemicals noted with a (B), if background level is greater than the GSIC, the background level becomes the default screening criteria.</p>
Risks due to hazardous substances in groundwater as a result of volatilization of those substances to indoor air.	Yes	Yes	Volatilization of substances in groundwater to indoor air could occur.	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria (GVIIC)	NA	<p>These criteria provide concentrations protective of inhalation exposure to hazardous substance vapors that may migrate from groundwater into indoor air.</p> <p>The current land use for the TBA property is a vocational school. The most reasonable predicted future land use is that the site will continue to be used as a vocational school. Therefore, these land uses align most closely with those representing the Limited Residential land use category.</p> <p>The generic criteria are applicable for the TBA property because some chemicals detected on the property are</p>

Table 4.1-1: Exposure Pathway Analysis for TBA Property
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Exposure Medium/Pathway As per Rule 532(7)	Relevant Pathway (i.e., can exposure occur)?	Criteria Applicable ?	Rationale	Applicable Generic Criteria	Site-Specific Criteria (if applicable)	Rationale
						<p>volatile substances, and the depth to groundwater is between 11 and 18 feet bgs (i.e., more than 3 meters bgs).</p> <p>As per footnote (S), if a hazardous substance has a GVIIC greater than its respective water solubility (water sol) limit, the GVIIC for that substance is equal to its water sol screening level.</p> <p>As per footnote (B), and only for those chemicals noted with a (B), if the background level is greater than the GVIIC, the background level becomes the default screening criteria.</p>
Soil						
Risks due to hazardous substances in soil as a result of direct contact with soil.	Yes	Yes	Human exposure to substances in soil via ingestion and dermal contact could occur.	Residential Direct Contact Criteria (DCC)	NA	<p>These criteria provide concentrations in soil that are protective against adverse health effects due to long-term ingestion of and dermal exposure to contaminated soil. These criteria are applicable throughout the soil column, regardless of depth.</p> <p>As per footnote (C), if a hazardous substance has a DCC greater than its respective Csat screening level, the DCC for that substance is equal to its Csat screening level.</p>
Risks due to hazardous substances in soil as a result of the inhalation of the substances being emitted to and dispersed in ambient air.	Yes	Yes	Human exposure to substances in soil via inhalation of volatiles in soil migrating to ambient air could occur.	Residential Infinite Source Volatile Soil Inhalation Criteria (VSIC)	NA	<p>These criteria provide concentrations that are protective of inhalation exposure to hazardous substance vapors that may migrate from soil to ambient air.</p> <p>The infinite source VSIC were selected for comparison to TBA property data because, as per MDEQ guidance, they can serve as a screening tool – i.e., if the available data is representative of the likely maximum soil concentration and these data do not exceed the criteria, then it is not necessary to propose remedial actions to address this pathway.</p> <p>VSIC are based upon a 1/2-acre source area. Criteria should be multiplied by the appropriate modifier when the source area is of a different size. For the TBA</p>

Table 4.1-1: Exposure Pathway Analysis for TBA Property
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Exposure Medium/Pathway As per Rule 532(7)	Relevant Pathway (i.e., can exposure occur)?	Criteria Applicable ?	Rationale	Applicable Generic Criteria	Site-Specific Criteria (if applicable)	Rationale
						<p>property, it was conservatively estimated that the source area would be 1.2 acres; thus as per MDEQ guidance, the modifier is 0.77 (i.e., that for the 2-acre source size).</p> <p>As per MDEQ guidance, if a hazardous substance has an adjusted VSIC greater than its respective Csat screening level, the VSIC for that substance is equal to its Csat screening level.</p> <p>These criteria provide concentrations in soil that are not expected to yield an ambient air concentration of contaminated particulates that would cause adverse human health effects through inhalation of ambient air.</p> <p>Fifty percent vegetative cover for each 1/2-acre is assumed in the PSIC equations. The TBA property has a larger percentage of vegetative cover, thus the values do not need to be adjusted for vegetative cover. Further, PSIC are based upon a 1/2-acre source area. Criteria should be multiplied by the appropriate modifier when the source area is of a different size. For the TBA property, it was conservatively estimated that the source area would be 1.2 acres; thus as per MDEQ guidance, the modifier is 0.77 (i.e., that for the 2-acre source size).</p> <p>As per MDEQ guidance, if a hazardous substance has an adjusted VSIC greater than its respective Csat screening level, the VSIC for that substance is equal to its Csat screening level.</p>
Risks due to hazardous substances in soil as a result of the leaching of the substances to drinking water.	Yes	Yes	While the TBA property will have a restrictive Covenant prohibiting use of groundwater for drinking water, this does not apply to the PGS area.	Residential Generic Drinking Water Protection Criteria (DWPC)	Site-Specific Leachate Testing (see notes)	<p>These criteria provide concentrations that are protective of groundwater, should hazardous substances leach to groundwater that is used for drinking.</p> <p>As per footnote (B), and only for those chemicals noted with a (B), if the state-wide background level is greater than the DWPC, the background level becomes the default screening criteria.</p>

Table 4.1-1: Exposure Pathway Analysis for TBA Property
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Exposure Medium/Pathway As per Rule 532(7)	Relevant Pathway (i.e., can exposure occur)?	Criteria Applicable ?	Rationale	Applicable Generic Criteria	Site-Specific Criteria (if applicable)	Rationale
						As per MDEQ Guidesheet #11, leachate testing may be done to determine site-specific leachate concentrations, which may be compared to the Residential Drinking Water Criteria. If the site-specific soil leachate concentration is less than the generic residential drinking water criterion, then the corresponding soil concentration may be used as the applicable soil criterion protective of drinking water. SPLP tests are acceptable leaching test methods as per Operational Memorandum #2 (Attachment 2). Further, facility-specific and appropriately collected groundwater data may, in some cases, serve as an in-situ demonstration that the soil contaminants do not pose a threat to the groundwater.
Risks due to hazardous substances in soil as a result of the leaching of the substances to groundwater and subsequent dermal contact with the groundwater.	Yes	Yes	Dermal exposure to groundwater could occur during construction activities or maintenance work on buried utilities.	Groundwater Contact Protection Criteria (GCPC)	Site-Specific Leachate Testing (see notes)	<p>Criteria provide concentrations that are protective against adverse health effects resulting from dermal exposures to hazardous substances in groundwater resulting from the leaching of hazardous substances in soil to groundwater.</p> <p>The generic criteria are applicable to the TBA property because the depth to groundwater is between 11 and 18 feet bgs, and utility work and/or subsurface excavation work could occur at these depths.</p> <p>As per footnote (C), if a hazardous substance has a GCPC greater than its respective Csat screening level, the criterion for that substance is equal to its Csat screening level.</p> <p>As per MDEQ Guidesheet #13, leachate testing may be done to determine site-specific leachate concentrations, which may be compared to the groundwater contact criteria (GCC). If the site-specific soil leachate concentration is less than the generic GCC, then the corresponding soil concentration may be used as the applicable soil criterion protective for groundwater contact. SPLP tests are acceptable leaching test methods as per Operational Memorandum #2 (Attachment 2). Further, facility-specific and appropriately collected groundwater data</p>

Table 4.1-1: Exposure Pathway Analysis for TBA Property
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Exposure Medium/Pathway As per Rule 532(7)	Relevant Pathway (i.e., can exposure occur)?	Criteria Applicable ?	Rationale	Applicable Generic Criteria	Site-Specific Criteria (if applicable)	Rationale
						may, in some cases, serve as an in-situ demonstration that the soil contaminants do not pose a threat to the groundwater.
Risks due to hazardous substances in soil as a result of the leaching of the substances to groundwater and the subsequent venting of the groundwater to surface water.	Yes	Yes	Groundwater from TBA property moves from the property, to the PGS area, and eventually vents to Mitchell Creek and Grand Traverse Bay.	Generic Groundwater to Surface Water Interface Protection Criteria (GSIPC)	Site-specific for PCE due to established Mixing Zone Determination Site-Specific Leachate Testing (see notes)	<p>These criteria provide soil concentrations that are not expected to leach hazardous substances to groundwater at levels greater than the corresponding generic GSI criterion.</p> <p>As per footnote (G), the GSIPC for certain chemicals should be determined based on the pH or hardness of the receiving surface water body. For these chemicals, the GSIPC is the higher of 20*GSI criterion for groundwater or the value determined by the process described in footnote (G). Further, as per Guidesheet #12, if a mixing zone determination has been made, the GSIPC can be established using similar methods by substituting the mixing zone based GSI criterion as the allowable groundwater concentration. An MZD has been made for PCE (Groundwater chronic MZD criterion of 60 ppb); thus, the corresponding GSIPC for PCE is 20*GSI or 1,200 ppb.</p> <p>As per footnote (X), the GSIPC for some chemicals are deemed not protective of groundwater that discharges to surface waters used as a drinking water source, or groundwater discharging to the Great Lakes and their connecting waters. The Grand Traverse Bay is a connecting water of Lake Michigan; therefore, the values in footnote (X) (i.e., the Soil Protection Criteria, or SPC) apply to the TBA property.</p> <p>As per footnote (B), and only for those chemicals noted with a (B), if the background level is greater than the GSIPC, the background level becomes the default screening criteria.</p> <p>As per MDEQ Guidesheet #12, leachate testing may be done to determine site-specific leachate concentrations, which may be compared to the groundwater GSI criteria. If the site-specific soil leachate concentration is less than the generic GW</p>

Table 4.1-1: Exposure Pathway Analysis for TBA Property
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Exposure Medium/Pathway As per Rule 532(7)	Relevant Pathway (i.e., can exposure occur)?	Criteria Applicable ?	Rationale	Applicable Generic Criteria	Site-Specific Criteria (if applicable)	Rationale
						<p>GSI, then the corresponding soil concentration may be used as the applicable soil criterion protective of GSI. SPLP tests are acceptable leaching test methods as per Operational Memorandum #2 (Attachment 2). Further, facility-specific and appropriately collected groundwater data may, in some cases, serve as an in-situ demonstration that the soil contaminants do not pose a threat to the groundwater.</p> <p>Finally, as per Guidesheet #12, the GSIPC that are calculated directly from the generic or mixing zone based GSI criteria do not need to be met at all points at the facility, if it is demonstrated that an alternative soil concentration will not leach hazardous substances to the groundwater at levels which will result in exceedance of the generic or mixing zone based criteria at the GSI..</p>
Risks due to hazardous substances in soil as a result of the direct transport of those substances to surface water as a result of erosion, runoff, or other similar means.	Yes	No	As per discussions with MDEQ, soil transport via erosion, runoff, or other similar transport mechanism is not a significant pathway at the TBA property.	NA	NA	NA
Risks due to hazardous substances in soil as a result of volatilization of those substances to indoor air.	Yes	Yes	Human exposure to substances in soil as a result of volatilization of those substances to indoor air could occur.	Residential Soil Volatilization to Indoor Air Inhalation Criteria (SVIIC)	NA	<p>These criteria provide concentrations that are protective of inhalation exposure to hazardous substance vapors that may migrate from soil to indoor air.</p> <p>These criteria are applicable to the TBA property because volatile substances are present in soil.</p> <p>As per footnote (C), if a hazardous substance has an SVIIC greater than its respective Csat screening level, the criterion for that substance is equal to its Csat screening level.</p>
Surface Water Sediments						
Risks due to hazardous substances in surface water sediments (GRAND	Yes	No	As per discussions with DEQ, this pathway is considered relevant, but the criteria are not applicable. Surface water and sediments are	NA	NA	NA

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Exposure Medium/Pathway As per Rule 532(7)	Relevant Pathway (i.e., can exposure occur)?	Criteria Applicable ?	Rationale	Applicable Generic Criteria	Site-Specific Criteria (if applicable)	Rationale
TRAVERSE BAY) when considering the factors identified in R 299.5730.			being addressed as a part of the overall site review (i.e., that for the PGS area). Further, transport of hazardous substances to Grand Traverse Bay is only through venting of groundwater, and the substances of concern do not pose a risk from bioaccumulation or bioconcentration, and do not require further evaluation.			
Risks due to hazardous substances in surface water sediments (MITCHELL CREEK) when considering the factors identified in R 299.5730.	Yes	Yes	Because chemicals were potentially discharged through the stormdrain directly to Mitchell Creek, further evaluation of the sediments in the creek is appropriate.	No numerical criteria are available for this pathway	USEPA Region V RCRA Ecological Screening Levels (ESLs)	As per discussions with MDEQ, this pathway should be evaluated using MDEQ's Operational Memorandum #4 (RRD-4), Attachment 3 -- Sediments (dated 8/2/2006 on MDEQ website). This memo suggests the use of the USEPA Region V ESLs as screening level criteria for evaluating surface water sediments. As per the memo, these criteria are intended to be protective of all potential pathways and exposures to sediment - human health and ecological, although protection of aquatic resources is the primary objective. More specifically, the sediment screening criteria referenced in the memo are derived to be protective of aquatic (surface water) and benthic (sediment-dwelling) receptors. The memo recommends using these screening criteria to evaluate sediment chemistry data. If data pass, then no further evaluation is necessary. If data does not pass the initial screen, then further evaluation (identification of site-specific criteria – e.g., through toxicity testing) is necessary.
Free-Phase Liquids						
Risks due to free-phase liquids and abandoned or discarded hazardous substances that have not yet been dispersed in the environment.	Yes	Yes	When reviewing all investigations that have occurred at the TBA property, free-phase liquids have not been observed. Further, groundwater data collected during this period do not indicate levels of contaminants at concentrations that would indicate the presence of free-phase liquids (e.g., concentrations of contaminants in groundwater are not near the saturation limit).	Numerical criteria have not been established for this pathway	Soil: Csat screening levels GW: solubility screening levels	As per discussions with MDEQ, this pathway can be evaluated by comparing soil data to Csat screening levels and groundwater data to water solubility screening levels.
Other Human Health or Environmental Effects						
Risks due to hazardous substances when	Yes	Yes	For acute hazards, the acute mixing zone based criteria calculated (i.e., the acute GSI criteria) are	Numerical criteria have	Acute GSI criteria; and	As per discussions with MDEQ, if the following conditions are met, this pathway can be eliminated

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Exposure Medium/Pathway As per Rule 532(7)	Relevant Pathway (i.e., can exposure occur)?	Criteria Applicable ?	Rationale	Applicable Generic Criteria	Site-Specific Criteria (if applicable)	Rationale
considering acute toxic effects, physical hazards, and other hazards not accounted for in the development of generic cleanup criteria.			protective of aquatic organisms, and the chemicals of concern for the site do not otherwise pose acute inhalation toxicity, flammability/explosivity potential, or ignitibility, corrosivity, or reactivity effects.	not been established for this pathway	Flammability and Acute Inhalation Screening Levels	from further consideration: <ul style="list-style-type: none"> - GW concentrations upgradient of the GSI (i.e., groundwater concentrations on the TBA property) are less than the acute GSI criteria - GW concentrations are less than their respective Flammability and Acute inhalation screening levels
Risks due to hazardous substances when considering impacts on terrestrial flora and fauna, on the food chain, and on the aesthetic characteristics of the affected environmental media, consistent with the requirements of R 299.5728.	Yes	No	Terrestrial ecological impacts and adverse aesthetic impacts are not addressed by the generic criteria, and thus were evaluated qualitatively. First, no evidence of a problem (e.g., soil discoloration or odors, stressed vegetation, injured wildlife, etc.) has been observed at the TBA property, thus further evaluation of aesthetics and/or ecological impacts is not necessary. Further, as per MDEQ guidance, facilities that are protective of surface water (i.e., the GSI criteria) are assumed to be protective of ecological hazards. Therefore, consideration of ecological impacts is not necessary.	NA	NA	NA

Table 4.5-1: Summary of Areas with Exceedances
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Area		Media	Constituent Exceeding Criteria	Pathway	Criteria	Maximum Value Exceeding Criteria ²	Maximum Value Exceeding Criteria (Recent Data) ³	Units	Discussion/Rationale	Evaluation of Remedial Objectives?	
	ORGANIC CONSTITUENTS IN GROUNDWATER										
TBA		Groundwater (Monitoring Wells)	TETRACHLOROETHENE	DWCres ¹	5	200	66	ug/L	PCE is the only CVOC at the Facility that constitutes a plume in groundwater. The source of PCE is within the northern portions of the TBA Property. The highest PCE concentration (200 ug/L at MW-TBA-03S located north of the main TBA CTC building) was reduced below the DWCres via the ERD Pilot Study treatment. Based on recent data, the highest PCE concentration was at MW-DBE-19B located north of the building (66 ug/L on 8/31/2009), with a lower concentration (40 ug/L) at this well on 5/7/10, In general, the maximum vertical extent of PCE is 40 feet bgs on the TBA Property, 60 feet bgs in the PGS Area, and 30 feet bgs in the GSI Area.	Yes	
				GSIC (generic)	11						
PGS		Groundwater (Monitoring Wells)		DWCres	5	95 (PGS wells) / 120 (GSI wells)	55 (PGS wells) / 100J (GSI wells)	ug/L			Groundwater discharges to East Bay and downriver portions of Mitchell Creek (i.e., water level data shows the creek is a gaining stream, thus, PCE will not migrate east of Mitchell Creek). PCE has never exceeded the acute GSIC of 2900 ug/L, nor have GSI PCE plume 95% UCL concentrations exceeded the site-specific MZD chronic GSI criterion of 60 ug/L. It is acknowledged that concentrations exceed the generic GSIC of 11 ug/L, and that restoration to the generic GSIC is requiredby MDEQ.
				GSIC (generic)	11						
TBA		Groundwater (Monitoring Wells)	TRICHLOROETHYLENE	DWCres ¹	5	8.5	6	ug/L	TCE has been a constituent of historical concern, but it was only sporadically detected at low concentrations, and it does not constitute a groundwater plume. In fact, TCE was not detected in soil above criteria, and was detected only three times in groundwater in the PGS area above the DWCres (twice in MW-04 (8.1 and 5.7 ug/l – both detected in 2005) and once in MW-13 at a concentration of 5.7 ug/l (in 2005)). Recent groundwater data indicate only one reported concentration of TCE above the DWCres (6 ug/L at MW-DBE-17A on 9/2/2009; TCE was detected at 2.6 ug/L in this well on 5/5/2010). The observed concentrations of TCE are likely due to degradation of PCE in the environment. Because PCE and TCE are within the same group of chemical compounds (chlorinated organics), and behave similarly in the environment, and because the two monitoring wells where TCE is detected above the DWCres are within the defined PCE plume, remedial actions proposed for PCE will address TCE.	Yes, with PCE	
PGS				DWCres	5	8.1	Not detected above DWCres	ug/L			

Table 4.5-1: Summary of Areas with Exceedances
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Area	Media	Constituent Exceeding Criteria	Pathway	Criteria	Maximum Value Exceeding Criteria ²	Maximum Value Exceeding Criteria (Recent Data) ³	Units	Discussion/Rationale	Evaluation of Remedial Objectives?	
TBA	Groundwater (Monitoring Wells)	CIS-1,2-DICHLOROETHENE	DWCres ¹	70	180	Not detected above DWCres	ug/L	The presence of these compounds in groundwater is likely due to degradation of PCE in the environment , especially as a result of the ERDPilot Study. Because cis-1,2-DCE and vinyl chloride are within the same group of chemical compounds (chlorinated organics), and behave similarly in the environment, and because the monitoring wells where these compounds have been detected above the DWCres are within the defined PCE plume, remedial actions proposed for PCE will address cis-1,2-DCE and vinyl chloride.	Yes, with PCE	
PGS			DWCres	70	230	Not detected above DWCres				
TBA	Groundwater (Monitoring Wells)	VINYL CHLORIDE	DWCres ¹	2	10	1.8	ug/L			
			GSIC	1						
			DWCres	2	8.9	8.9				ug/L
PGS			GSIC	1						
POTENTIAL SOURCE AREAS ON TBA PROPERTY										
TBA: Trench System	Soil	DICHLOROMETHANE	DWPC	0.1	0.14	-	mg/kg	Dichloromethane was only detected in SB-TBA-009 within the area; however, all detections were "J" qualified and the highest concentration was only 140 ug/kg. Dichloromethane was detected in groundwater (in soil borings) within the area only once at SB-TBA-009 at 1.7J ug/L. In groundwater (in all monitoring wells) dichloromethane was only detected once (1J ug/L at MW-4 in December 2005). As the criteria exceeded the DWPC and there are limited detections in groundwater, all below DW criteria, no further evaluation is necessary. The Trench System is beneath the CTC Building, thus maintaining the building as an infiltration barrier is included in the remedial objectives.	Yes, Infiltration Barrier	
		TETRACHLOROETHENE	DWPC	0.1	0.2	-	mg/kg	PCE only detected 2 times in 33 samples above criteria within the Trench System area. The maximum detect was only slightly above criteria. No further evaluation warranted as extent in soil well characterized. The Trench System is beneath the CTC Building, thus maintaining the building as an infiltration barrier is included in the remedial objectives.	Yes, Infiltration Barrier	
	Groundwater (Soil Boring)	None	-	-	-	-	-	No constituents detected above applicable criteria. Although the drinking water criteria are not applicable on the TBA Property, PCE values were compared to the DWCres. PCE values in some borings in this area exceed the DWCres.	No	
TBA: East Sediment Trap	Soil	None	-	-	-	-	-	No constituents were detected above applicable criteria.	No	
	Groundwater (Soil Boring)	None	-	-	-	-	-	No constituents detected above applicable criteria. Although the drinking water criteria arenot applicable on the TBA Property, PCE values were compared to the DWCres. PCE values in this area do not exceed the DWCres.	No	
TBA: SWDS Line near North Central Portion of Building	Soil	None	-	-	-	-	-	No constituents detected above applicable criteria.	No	
	Groundwater (Soil Boring)	None	-	-	-	-	-	No constituents detected above applicable criteria. Although the drinking water criteria are not applicable on the TBA Property, PCE values were compared to the DWCres. PCE values in some borings in this area exceed the DWCres.	No	

Table 4.5-1: Summary of Areas with Exceedances
Pine Grove Subdivision Facility
Traverse City, Michigan

Area	Media	Constituent Exceeding Criteria	Pathway	Criteria	Maximum Value Exceeding Criteria ²	Maximum Value Exceeding Criteria (Recent Data) ³	Units	Discussion/Rationale	Evaluation of Remedial Objectives?
TBA: SWDS Line East of Building	Soil	DICHLOROMETHANE	DWPC	0.1	0.22 JB	-	mg/kg	Pathway incomplete. Dichloromethane was detected in one boring (TBA-026) within the area; however all data is "JB" qualified indicating potential laboratory contamination. Dichloromethane was not detected in groundwater (in soil borings) within the area. In groundwater (in all monitoring wells) dichloromethane was only detected once (1J ug/L at MW-4 in December 2005). As the criteria exceeded is the DWPC and there are limited detections in groundwater, all below DW criteria, no further evaluation in necessary, and no further evaluation of remedial objectives is necessary (i.e., not detected in groundwater, no infiltration barrier present, thus incomplete pathway).	No
	Groundwater (Soil Boring)	None	-	-	-	-	-	No constituents detected above applicable criteria. Although the drinking water criteria are not applicable on the TBA Property, PCE values were compared to the DWCrises. PCE values in some borings in this area exceed the DWCrises.	No
TBA: SWDS Under East Side TBA Building	Soil	DICHLOROMETHANE	DWPC	0.1	0.12 JB	-	mg/kg	Dichloromethane was only detected in one boring (SB-TBA-015) in the area; however all data is "JB" qualified indicating potential laboratory contamination. Dichloromethane was not detected in groundwater (in soil borings) within the area. In groundwater (in all monitoring wells) dichloromethane was only detected once (1J ug/L at MW-4 in December 2005). As the criterion exceeded is the DWPC and there are limited detections in groundwater, all below DW criteria, no further evaluation in necessary. The SWDS System is beneath the CTC Building, thus maintaining the building as an infiltration barrier is included in the remedial objectives.	Yes, Infiltration Barrier
	Groundwater (Soil Boring)	None	-	-	-	-	-	No constituents detected above applicable criteria. Although the drinking water criteria are not applicable on the TBA Property, PCE values were compared to the DWCrises. PCE values in this area do not exceed the DWCrises.	No
TBA: SWDS Line junction North of Building/Pipe A/C Junction	Soil	BROMOMETHANE	DWPC	0.2	0.22 JB	-	mg/kg	Bromomethane was detected in 1 boring (SB-TBA-020), and all data were "JB" or "B" qualified indicating potential laboratory contamination. Bromomethane was detected in one groundwater sample (in soil borings) in the area, but the data was "JB" qualified. In groundwater (in all monitoring wells) bromomethane has never been detected. As the criteria exceeded is the DWPC and there are limited detections in groundwater, all below DW criteria, no further evaluation in necessary. The Pipe A/C junction is beneath the CTC Building, thus maintaining the building as an infiltration barrier is included in the remedial objectives.	Yes, Infiltration Barrier
		DICHLOROMETHANE	DWPC	0.1	0.17 JB	-	mg/kg	Dichloromethane was detected in 1 boring (SB-TBA-020), and all data were "JB" qualified indicating potential laboratory contamination. Dichloromethane was detected in one groundwater sample (in soil borings) in the area, but the data was "JB" qualified. In groundwater (in all monitoring wells) dichloromethane was only detected once (1J ug/L at MW-4 in December 2005). As the criterion exceeded is the DWPC and there are limited detections in groundwater, all below DW criteria, no further evaluation in necessary. The Pipe A/C junction is beneath the CTC Building, thus maintaining the building as an infiltration barrier is included in the remedial objectives.	Yes, Infiltration Barrier

Table 4.5-1: Summary of Areas with Exceedances
Pine Grove Subdivision Facility
Traverse City, Michigan

Area	Media	Constituent Exceeding Criteria	Pathway	Criteria	Maximum Value Exceeding Criteria ²	Maximum Value Exceeding Criteria (Recent Data) ³	Units	Discussion/Rationale	Evaluation of Remedial Objectives?
TBA: SWDS Line junction North of Building/Pipe A/C Junction (continued)	Groundwater (Soil Boring)	None	-	-	-	-	-	No constituents detected above applicable criteria. Although the drinking water criteria are not applicable on the TBA Property, PCE values were compared to the DWCres. PCE values in some borings in this area exceed the DWCres.	No
TBA: Near Main Entrance	Soil	None	-	-	-	-	-	No constituents were detected above applicable criteria.	No
	Groundwater (Soil Boring)	None	-	-	-	-	-	No constituents detected above applicable criteria. Although the drinking water criteria are not applicable on the TBA Property, PCE values were compared to the DWCres criteria. PCE values in this area do not exceed the DWCres.	No
TBA: South Central Portion of the TBA Building (BH-8) Area	Soil	BROMOMETHANE	DWPC	0.2	0.22 B	-	mg/kg	Bromomethane was detected in one boring (SB-TBA-028) ; however the data is "B" qualified indicating potential laboratory contamination. Bromoromethane was not detected in groundwater (in soil borings) in the area. In groundwater (in all monitoring wells) bromomethane has never been detected. As the criteria exceeded is the DWPC and there are limited detections in groundwater, all below DW criteria, no further evaluation in necessary. The BH-8 area is beneath the CTC Building or pavement, thus maintaining the building as an infiltration barrier is included in the remedial objectives.	Yes, Infiltration Barrier
		COBALT	Background	6.8	0.87	-	mg/kg	The Statewide default background level is 6.8 mg/kg, which is higher than the maximum value detected. No further evaluation necessary.	
			DWPC	0.8		-			No
		DICHLOROMETHANE	DWPC	0.1	0.24 JB	-	mg/kg	Dichloromethane was detected in one boring (SB-TBA-028) ; however the data is "JB" qualified indicating potential laboratory contamination. Dichloromethane was not detected in groundwater (in soil borings) in the area. In groundwater (in all monitoring wells) dichloromethane was only detected once (1J ug/L at MW-4 in December 2005). As the criterion exceeded is the DWPC and there are limited detections in groundwater, all below DW criteria, no further evaluation in necessary. The BH-8 area is beneath the CTC Building or pavement, thus maintaining the building as an infiltration barrier is included in the remedial objectives.	Yes, Infiltration Barrier
	Groundwater (Soil Boring)	COPPER (TOTAL)	GSIC	11	39.7	-	ug/L	Exceedance in a total analysis sample only; was not exceeded in companion dissolved analysis sample. Suggests bias due to particulate matter. At the request of MDEQ, additional sampling in groundwater from monitoring wells was performed in February 2006, no detections above criteria found. No further evaluation necessary.	No
		LEAD (TOTAL)	GSIC	14	19.3	-	ug/L	Exceedance in a total analysis sample only; was not exceeded in companion dissolved analysis sample. Suggests bias due to particulate matter. At the request of MDEQ, additional sampling in groundwater from monitoring wells was performed in February 2006 (to assess concentrations in groundwater without particulate interference). Refer to row below discussing inorganics in groundwater from monitoring wells.	(see "Inorganic Constituents in Groundwater" below)
		MERCURY (DISSOLVED)	GSIC	0.0013	0.14	-	ug/L	Additional sampling in groundwater from monitoring wells has been performed; see later row discussing groundwater from monitoring wells.	(see "Inorganic Constituents in Groundwater" below)

Table 4.5-1: Summary of Areas with Exceedances
Pine Grove Subdivision Facility
Traverse City, Michigan

Area	Media	Constituent Exceeding Criteria	Pathway	Criteria	Maximum Value Exceeding Criteria ²	Maximum Value Exceeding Criteria (Recent Data) ³	Units	Discussion/Rationale	Evaluation of Remedial Objectives?
TBA: South Central Portion of the TBA Building (BH-8) Area (continued)	Groundwater (Soil Boring) (continued)	MERCURY (TOTAL)	GSIC	0.0013	0.11	-	ug/L	Additional sampling in groundwater from monitoring wells has been performed; see later row discussing groundwater from monitoring wells.	(see "Inorganic Constituents in Groundwater" below)
		VANADIUM (TOTAL)	GSIC	12	64.9	-	ug/L	Additional sampling in groundwater from monitoring wells has been performed; see later row discussing groundwater from monitoring wells.	(see "Inorganic Constituents in Groundwater" below)
TBA: Vicinity of GM-3	Soil	DICHLOROMETHANE	DWPC	0.1	0.11 J	-	mg/kg	Pathway incomplete. Dichloromethane was detected in two borings (SB-TBA-017, -018); however all data were "J" qualified and the highest detection was only 0.11 mg/kg. Dichloromethane was not detected in groundwater (in soil borings) in the area. In groundwater (in all monitoring wells) dichloromethane was only detected once (1J ug/L at MW-4 in December 2005). As the criteria exceeded is the DWPC and there are limited detections in groundwater, all below DW criteria, no further evaluation in necessary, and no further evaluation of remedial objectives is necessary (i.e., not detected in groundwater, no infiltration barrier present, thus incomplete pathway).	No
	Groundwater (Soil Boring)	None	-	-	-	-	-	No constituents detected above applicable criteria. Although the drinking water criteria are not applicable on the TBA Property, PCE values were compared to the DWCrises. PCE values in some borings in this area exceed the DWCrises.	No
TBA: Former Helicopter Blade Testing Pad	Soil	None	-	-	-	-	-	No constituents were detected above applicable criteria.	No
TBA: Closed Lagoons - South Side of TBA property	Soil	COBALT	Background	6.8	1.27 (95UCL = 0.70)	-	mg/kg	The Statewide default background level is 6.8 mg/kg, which is higher than the maximum value detected. Further, the 95% UCL value does not exceed criteria.	No
			DWPC	0.8		-			
		MERCURY	Background	0.13	0.144 (95UCL = 0.043)	-	mg/kg	95% UCL value does not exceed criteria; maximum value only exceeded criterion slightly and only once in 16 samples; therefore, likely represents background conditions, unrelated to site activities.	No
			GSIPC	0.05		-			
	Groundwater (Soil Boring)	CHROMIUM (HEXAVALENT)	GSIC	11	50	-	ug/L	Additional sampling in groundwater from monitoring wells has been performed; see later row discussing groundwater from monitoring wells.	(see "Inorganic Constituents in Groundwater" below)
		CHROMIUM (TOTAL)	GSIC	92	656	-	ug/L	Additional sampling in groundwater from monitoring wells has been performed; see later row discussing groundwater from monitoring wells.	(see "Inorganic Constituents in Groundwater" below)
		COPPER (TOTAL)	GSIC	11	57.3	-	ug/L	Exceedance in a total analysis sample only; was not exceeded in companion dissolved analysis sample. Suggests bias due to particulate matter. At the request of MDEQ, additional sampling in groundwater from monitoring wells was performed in February 2006 (to assess concentrations in groundwater without particulate interference), no detections above criteria found. No further evaluation necessary.	No

Table 4.5-1: Summary of Areas with Exceedances
Pine Grove Subdivision Facility
Traverse City, Michigan

Area	Media	Constituent Exceeding Criteria	Pathway	Criteria	Maximum Value Exceeding Criteria ²	Maximum Value Exceeding Criteria (Recent Data) ³	Units	Discussion/Rationale	Evaluation of Remedial Objectives?
TBA: Closed Lagoons - South Side of TBA property (continued)	Groundwater (Soil Boring) (continued)	MERCURY (TOTAL)	GSIC	0.0013	0.16	-	ug/L	Additional sampling in groundwater from monitoring wells has been performed; see later row discussing groundwater from monitoring wells.	(see "Inorganic Constituents in Groundwater" below)
		VANADIUM (TOTAL)	GSIC	12	32	-	ug/L	Additional sampling in groundwater from monitoring wells has been performed; see later row discussing groundwater from monitoring wells.	(see "Inorganic Constituents in Groundwater" below)
SOILS OUTSIDE POTENTIAL SOURCE AREAS ON TBA PROPERTY									
TBA: Soils Outside Potential Source Areas	Soil	None	-	-	-	-	-	All soils outside potential source areas were sampled and analyzed for VOCs; all results were below applicable criteria. Based on groundwater impacts there is no evidence to suggest that there are unidentified PCE source areas. Additional investigation or evaluation of soils outside potential source areas will not be pursued as there is no evidence of historical use or impact. (See Note 4).	No
INORGANIC CONSTITUENTS IN GROUNDWATER									
TBA	Groundwater (Monitoring Wells)	ALUMINUM	DWCres ¹	50	677	-	ug/L	The identified DWCres for aluminum is the aesthetic (secondary drinking water criterion). Per the footnote (V), if the concentrations of aluminum are above the DWCres, but below the health-based value of 300 ug/L, a notice of aesthetic impact could be implemented in lieu of further remedial action. Only groundwater samples collected from the TBA property exceed the HDV; aluminum was not detected above this health-based value in the PGS Area. Because the drinking water criteria are not applicable on the TBA property (due to the Restrictive Covenant), and exceedances of the drinking water criteria are not present in the PGS Area, no further evaluation of aluminum in groundwater is necessary.	No
			HDV	300					
TBA	Groundwater (Monitoring Wells)	CHROMIUM (HEXVALENT)	GSIC	11	105	-	ug/L	Concentrations of hexavalent chromium exceed the GSIC in several monitoring wells on the TBA property, including MW-08s, MW-09s, MW-11s, MW-14s, OW-01s, and MW-DBE-16b, but only at two monitoring wells in the upgradient portion of the PGS Area (MW-08 and MW-12s). Hexavalent chromium is not detected further downgradient in the PGS Area. The DWCres for hexavalent chromium is 100 ug/L, which is not applicable on the TBA property and is not exceeded in the PGS Area.	No
PGS			DWCres ¹	100					
TBA	Groundwater (Monitoring Wells)	CHROMIUM (TOTAL)	GSIC	11	58.6	-	ug/L		
			DWCres ¹	100					
TBA	Groundwater (Monitoring Wells)	CHROMIUM (TOTAL)	GSIC	92	125	-	ug/L	The GSIC for total chromium is 92 ug/L, and is only exceeded at MW-08s and MW-09s on the TBA Property. Because total chromium was not detected above the GSIC in the PGS Area, this pathway is not a concern for total chromium. The DWCres for total chromium is only exceeded on the TBA Property. Because the drinking water criteria are not applicable on the TBA Property (due to the Restrictive Covenant), and exceedances of the drinking water criteria are not present in the PGS Area, no further evaluation of chromium in groundwater is necessary.	No
			DWCres ¹	100					

Table 4.5-1: Summary of Areas with Exceedances
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Area	Media	Constituent Exceeding Criteria	Pathway	Criteria	Maximum Value Exceeding Criteria ²	Maximum Value Exceeding Criteria (Recent Data) ³	Units	Discussion/Rationale	Evaluation of Remedial Objectives?	
TBA	Groundwater (Monitoring Wells)	IRON	DWCres ¹	300	12,900	12,900	ug/L	The identified DWCres for iron is the aesthetic (secondary drinking water criterion). Per the footnote (E), if the concentrations of iron are above the DWCres, but below the health-based value of 2,000 ug/L, a notice of aesthetic impact could be implemented in lieu of further remedial action. Iron was detected at a maximum concentration of 12,900 ug/L on the TBA Property and at 11,800 ug/L in the PGS Area (10,800 ug/L using more recent data). During the ERD Pilot Study treatment process, where the aquifer geochemical conditions are altered from aerobic to anaerobic, concentrations of certain constituents in groundwater can increase in the area influenced by injections. As discussed in Section 2.0, the anaerobic conditions that were created as a result of the ERD treatment resulted in the presence of elevated dissolved iron. Discussion of iron is included in the discussion of ERD secondary effects in Section 2, while performance objectives are provided in Section 5 and response activities are provided in Section 7.	Yes	
			HDV	2,000						
PGS				DWCres	300	11,800	10,800			ug/L
				HDV	2,000					
TBA	Groundwater (Monitoring Wells)	LEAD	DWCres ¹	4	6.8	-	ug/L	Lead was detected only once above the DWCres of 4 ug/L, on the TBA property. This concentration is below the state action level of 15 ug/L, thus no further action is warranted regarding lead.	No	
TBA	Groundwater (Monitoring Wells)	MANGANESE	DWCres ¹	50	2,510	464	ug/L	The identified DWCres for manganese is the aesthetic (secondary drinking water criterion). Per the footnote (E), if the concentrations of manganese are above the DWCres, but below the health-based value of 860 ug/L, a notice of aesthetic impact could be implemented in lieu of further remedial action. Manganese was detected at a maximum detected concentration of 2,510 ug/L on the TBA property and at 2,040 ug/L in the PGS area. Recent data show a maximum concentration of 464 ug/L on the TBA property and 685 ug/L in the PGS area. Recent data show compliance with the HDV and GSIC for manganese. During the ERD process, where the aquifer geochemical conditions are altered from aerobic to anaerobic, concentrations of certain constituents in groundwater can increase in the area influenced by injections. As discussed in Section 2.0, the anaerobic conditions that were created as a result of the ERD treatment resulted in the presence of dissolved manganese. Concentrations are continuing to decrease, as shown with recent data. Discussion of manganese is included in the discussion of ERD secondary effects in Section 2, while performance objectives are provided in Section 5 and response activities are provided in Section 7.	Yes	
			HDV	860						
PGS				GSIC	1,300	2,040	685			ug/L
				DWCres	50					
TBA	Groundwater (Monitoring Wells)	MERCURY	Background	0.0045	0.19	-	ug/L	Concentrations of mercury were detected above background (0.0045 ug/L) and above the GSIC at several wells on the TBA property, but not above background in the PGS area. No further evaluation of mercury is necessary.	No	
			GSIC	0.0013						
PGS				Background	0.0045	0.0038	-			ug/L
				GSIC	0.0013					
TBA	Groundwater (Monitoring Wells)	SELENIUM	GSIC	5	6.5	-	ug/L	Selenium was detected 6 of 47 samples, with a maximum detected concentration of 6.5 ug/L at MW-TBA-03s on the TBA property. This value exceeds the GSIC of 5 ug/L, but not the DWCres of 50 ug/L; thus the drinking water pathway is not a pathway of concern for selenium. Selenium was not detected above criteria in the PGS area, thus the GSI pathway is not a pathway of concern.	No	

Table 4.5-1: Summary of Areas with Exceedances
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Area	Media	Constituent Exceeding Criteria	Pathway	Criteria	Maximum Value Exceeding Criteria ²	Maximum Value Exceeding Criteria (Recent Data) ³	Units	Discussion/Rationale	Evaluation of Remedial Objectives?
TBA	Groundwater (Monitoring Wells)	SODIUM	DWCres ¹	120,000	290,000	-	ug/L	Sodium was detected at a maximum detected concentration of 290,000 ug/L . Concentrations of sodium exceed the DWCres of 120,000 ug/L at only two wells: MW-DBE-14 and MW-DBE-15a; there is no associated GSIC for sodium. Sodium was not detected above the DWCres in the PGS area. Because the drinking water criteria are not applicable on the TBA property (due to the Restrictive Covenant), and exceedances of the drinking water criteria are not present in the PGS area, no further evaluation of sodium in groundwater is necessary.	No
TBA	Groundwater (Monitoring Wells)	THALLIUM	DWCres ¹	2	6.9	-	ug/L	Thallium was detected at a maximum concentration of 6.9 ug/L, and was not detected in the PGS area. Detected concentrations of thallium have been qualified with a “B” indicating possible laboratory contamination. Further, drinking water criteria are not applicable on the TBA property (due to the Restrictive Covenant), and exceedances of the drinking water and GSI criteria are not present in the PGS area, thus no further evaluation of thallium in groundwater is necessary.	No
			GSIC	2					
TBA	Groundwater (Monitoring Wells)	VANADIUM	DWCres ¹	4.5	4.6	-		Vanadium was detected only once above the DWCres – the maximum detected concentration of vanadium was 4.6 B ug/L at PW-1. Further, this value is qualified with a “B” indicating possible laboratory contamination. Vanadium was not detected above the DWCres or the GSIC in the PGS area. Because the drinking water criteria are not applicable on the TBA property (due to the Restrictive Covenant), and exceedances of the drinking water and GSI criteria are not present in the PGS area, no further evaluation of vanadium in groundwater is necessary.	No
SEC PARAMETERS IN GROUNDWATER									
TBA	Groundwater (Monitoring Wells)	ACETIC ACID	DWCres ¹	4,200	520,000	31,000	ug/L	As a part of the evaluation of the ERD Pilot Study, several parameters were measured in groundwater, some of which have corresponding Part 201 criteria. The parameters that exceed criteria include acetic acid, chloride, methane, nitrite, propionic acid and phosphorous. The presence of these compounds in groundwater are related to the ERD treatment and are indicators that reductive dechlorination are occurring and the injected materials are migrating in the treatment areas, thus their detection was considered beneficial to the ERD Pilot Study at the site. Regarding methane, the ERD process generated methane in groundwater; methane generation (i.e., methanogenesis) indicates that anaerobic conditions were developing. Because of this methane exceedance, regular monitoring of vapor phase methane in groundwater headspace of monitoring wells, soil gas and indoor air of the CTC Building was conducted and showed methane never approached the screening level of 1.25% methane (25% of	Yes
PGS			GSIC	11,000					
			DWCres	4,200	410,000	Not detected above DWCres or GSIC	ug/L		
TBA	Groundwater (Monitoring Wells)	CHLORIDE	DWCres ¹	250,000					
PGS			GSIC	50,000	260,000	260,000	ug/L		
			TBA	Groundwater (Monitoring Wells)					
PGS	FESL	520	26,000		26,000	ug/L			

Table 4.5-1: Summary of Areas with Exceedances
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Area	Media	Constituent Exceeding Criteria	Pathway	Criteria	Maximum Value Exceeding Criteria ²	Maximum Value Exceeding Criteria (Recent Data) ³	Units	Discussion/Rationale	Evaluation of Remedial Objectives?
TBA	Groundwater (Monitoring Wells)	NITRATE	DWCres ¹	10,000	29,000	Not detected above DWCres	ug/L	methane's LEL) at any location. Discussion of all these parameters is included in the discussion of ERD secondary effects in Section 2, while performance objectives are provided in Section 5 and response activities are provided in Section 7.	
PGS			DWCres	10,000	4,740	Not detected above DWCres	ug/L		
TBA	Groundwater (Monitoring Wells)	NITRITE	DWCres ¹	1,000	1,280	Not detected above DWCres	ug/L		
PGS			DWCres	1,000	2,980	Not detected above DWCres	ug/L		
TBA	Groundwater (Monitoring Wells)	PROPIONIC ACID	DWCres ¹	12,000	59,000	Not detected above DWCres	ug/L		
PGS			DWCres	12,000	41,000	Not detected above DWCres	ug/L		
TBA	Groundwater (Monitoring Wells)	PHOSPHOROUS	GSIC	1,000	14,300	Not detected above GSIC	ug/L		
SEDIMENT									
Mitchell Creek	Sediment	ACETONE - UPSTREAM	R5ESL	0.0099	0.48		mg/kg	Acetone is a laboratory contaminant (was detected in trip blank). Acetone was detected upstream, downstream, and at point of discharge at similar concentrations. Therefore, the concentration is not likely associated with the stormwater point of discharge.	No
		ACETONE - DOWNSTREAM	R5ESL	0.0099	0.48		mg/kg		
		ACETONE - SWDS LINE POINT OF DISCHARGE	R5ESL	0.0099	0.47		mg/kg		
		BROMOMETHANE - SWDS LINE POINT OF DISCHARGE	R5ESL	0.00137	0.13		mg/kg	Bromomethane was detected only at the point of discharge. However, based on weight of evidence, further evaluation is not considered necessary. The keys points in coming to this conclusion are the modifications in the Mitchell Creek area, the limited sediment extent and thickness, no known use of bromomethane on the TBA property, the potential contributions from unknown upstream sources, nearby road construction during sampling, and the lack of PCE impacts. See text in Section 2.1.2.4 and 2.2.4 of the RAP for additional details.	No

Table 4.5-1: Summary of Areas with Exceedances
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Area	Media	Constituent Exceeding Criteria	Pathway	Criteria	Maximum Value Exceeding Criteria ²	Maximum Value Exceeding Criteria (Recent Data) ³	Units	Discussion/Rationale	Evaluation of Remedial Objectives?
<p>Notes:</p> <p>DWPC - Drinking Water Protection Criteria</p> <p>DWCres - Residential Drinking Water Criteria.</p> <p>GSIC - Groundwater Surface Water Interface Criteria.</p> <p>GSIPC - Groundwater Surface Water Interface Protection Criteria.</p> <p>FESL – Flammability and Explosivity Screening Level</p> <p>NA - Not Applicable.</p> <p>R5ESL - USEPA Region 5 RCRA Sediment Ecological Screening Level</p> <p>(1) It is recognized that while the DWCres are not applicable on the TBA Property, they are applicable in the PGS Area; thus, comparison to these criteria are presented for summary purposes.</p> <p>(2) Maximum values from data set incorporating sampling events from January 2005-September 2011.</p> <p>(3) Maximum values from more recent data, indicating progress since the ERD Pilot Study (data from March 2009 – September 2011).</p> <p>(4) PCE was detected in only 3 borings outside of potential source areas (SB-TBA-143, SB-TBA-163 and SB-TBA-167). All 3 borings were below applicable criteria including the DWPC. Furthermore, all 3 borings are located south of the main TBA building where, based on 3 rounds of recent groundwater sampling, there are no indications of PCE levels in groundwater above DWCres criteria.</p>									

Figures

Path: J:\Rem Eng\Project Files\AK Steel\0076-045 AK Steel\GIS\Projects\Due Care Plan\Figure 1-1 Site Map.mxd



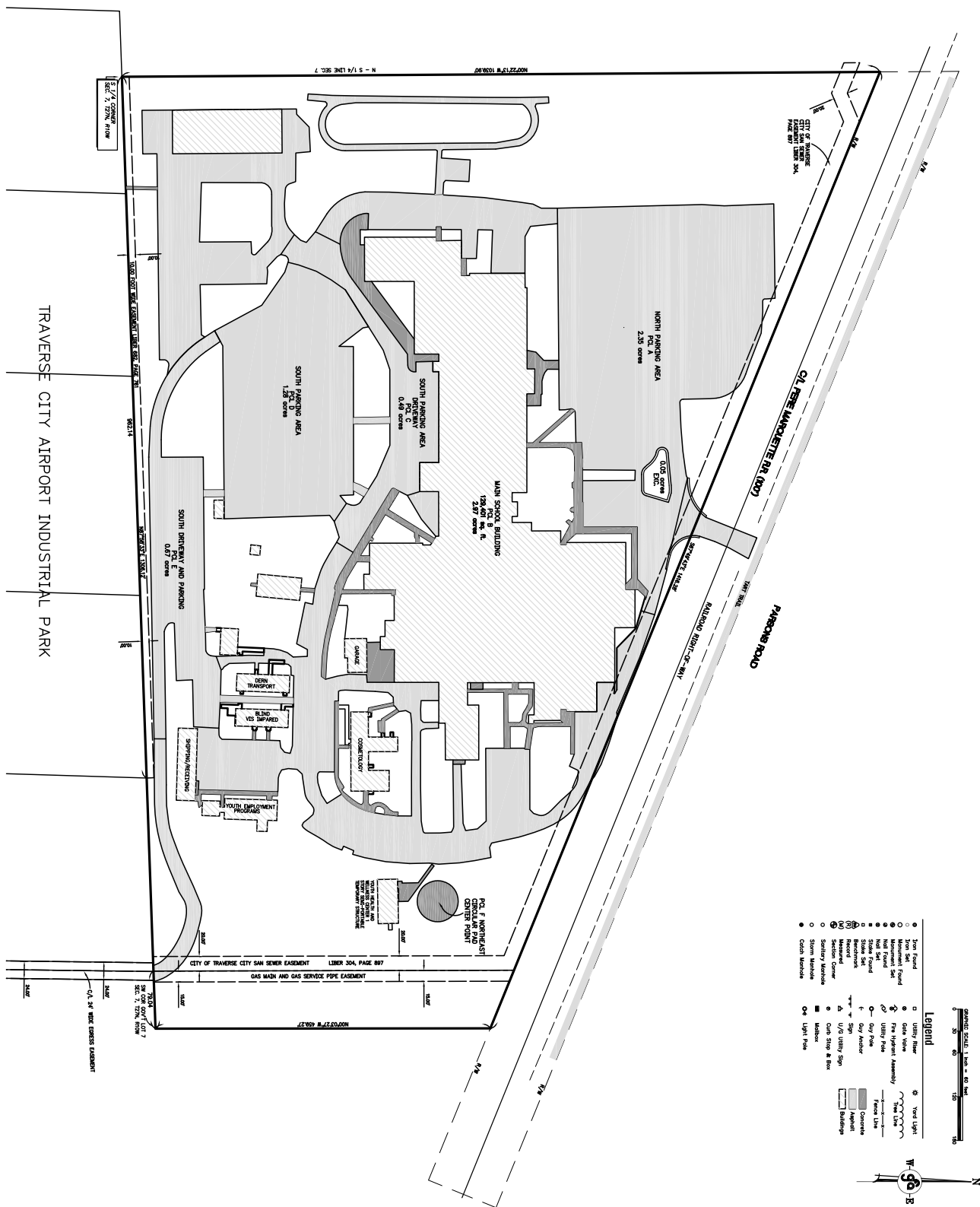


Figure 2-1: TBA Site Map

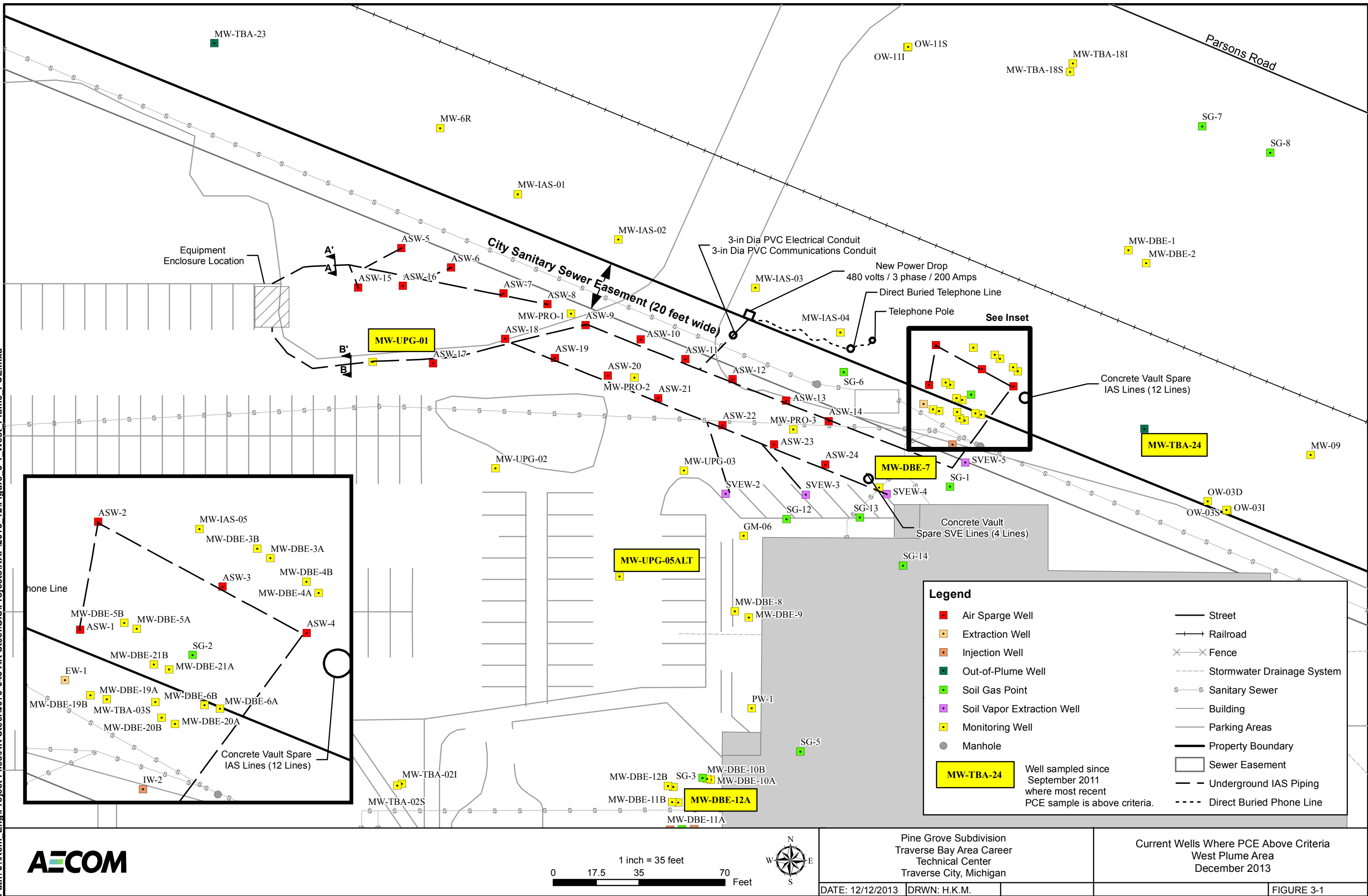
SECTION 7, TOWN 27 NORTH, RANGE 10 WEST
EAST BAY TWP, GRAND TRAVERSE CO, MI

[illegible]

PH 231.946.5874
FAX 231.946.3703
WWW.goundfraser.com
123 W Front Street
Traverse City, MI 49684



Path: J:\Rem Eng\Project Files\AK Steel\GIS\Projects\RAP\2013 12\Figure 3-1 West Plume PCE.mxd



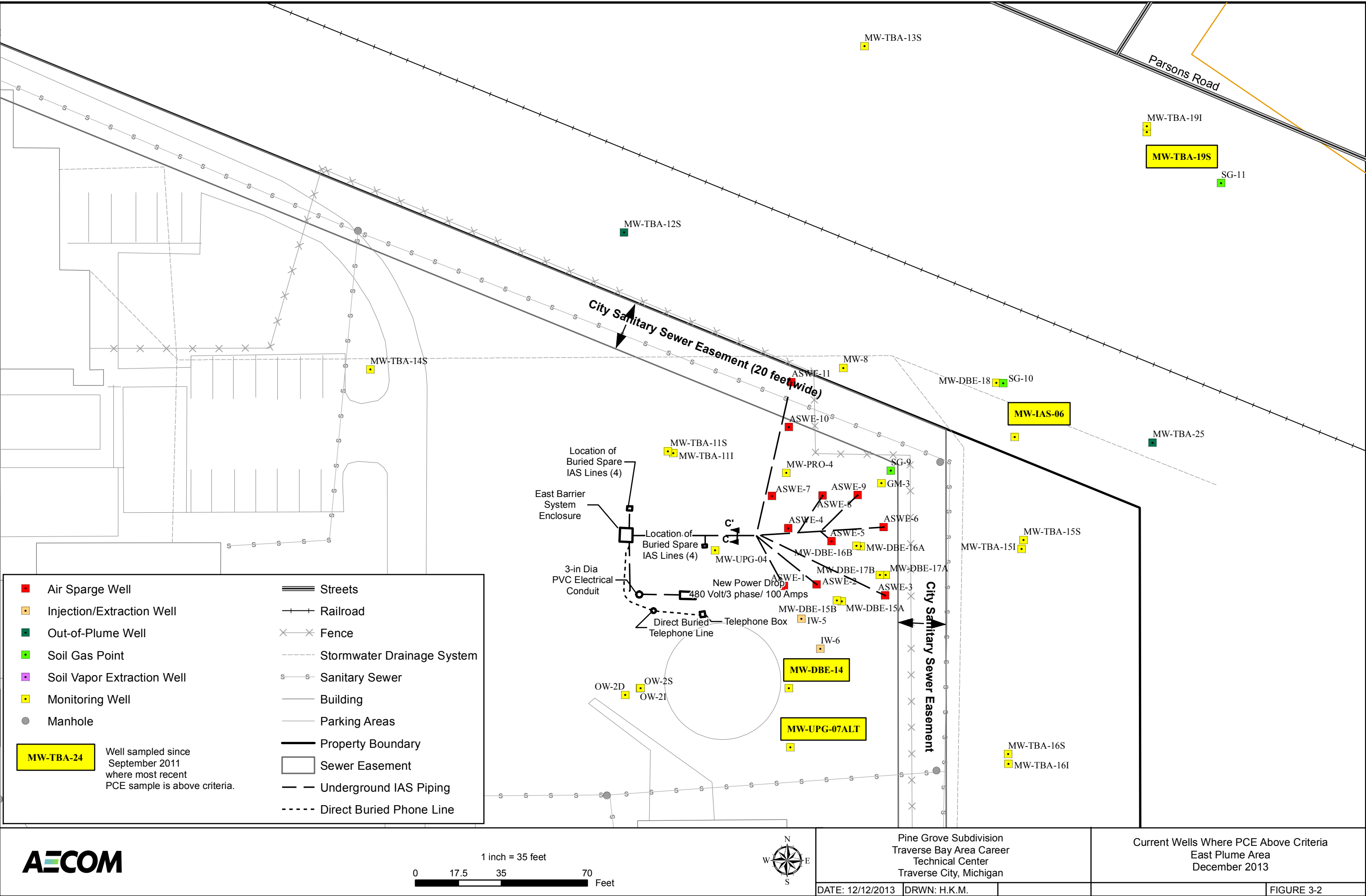
Pine Grove Subdivision
Traverse Bay Area Career
Technical Center
Traverse City, Michigan

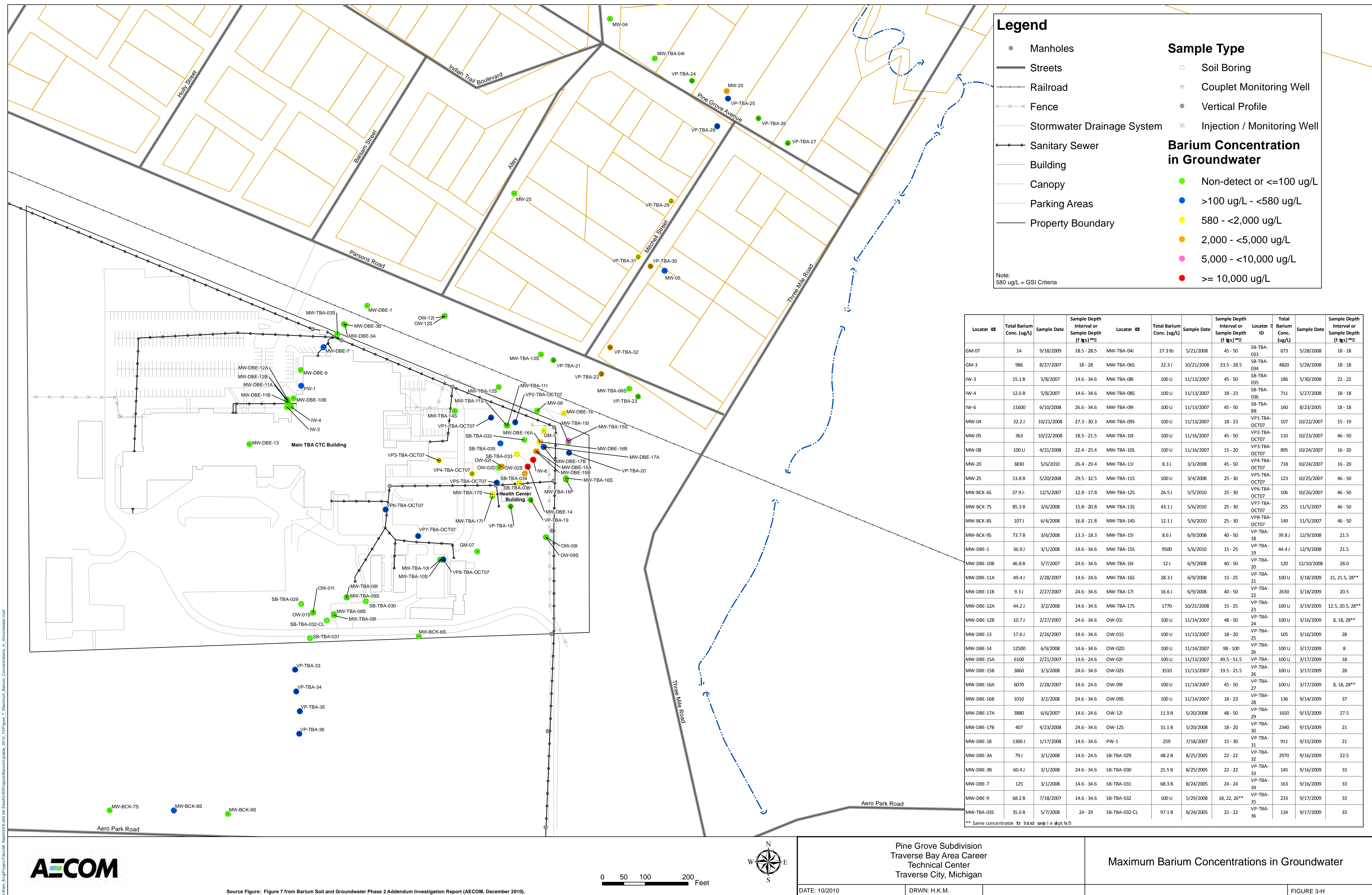
Current Wells Where PCE Above Criteria
West Plume Area
December 2013

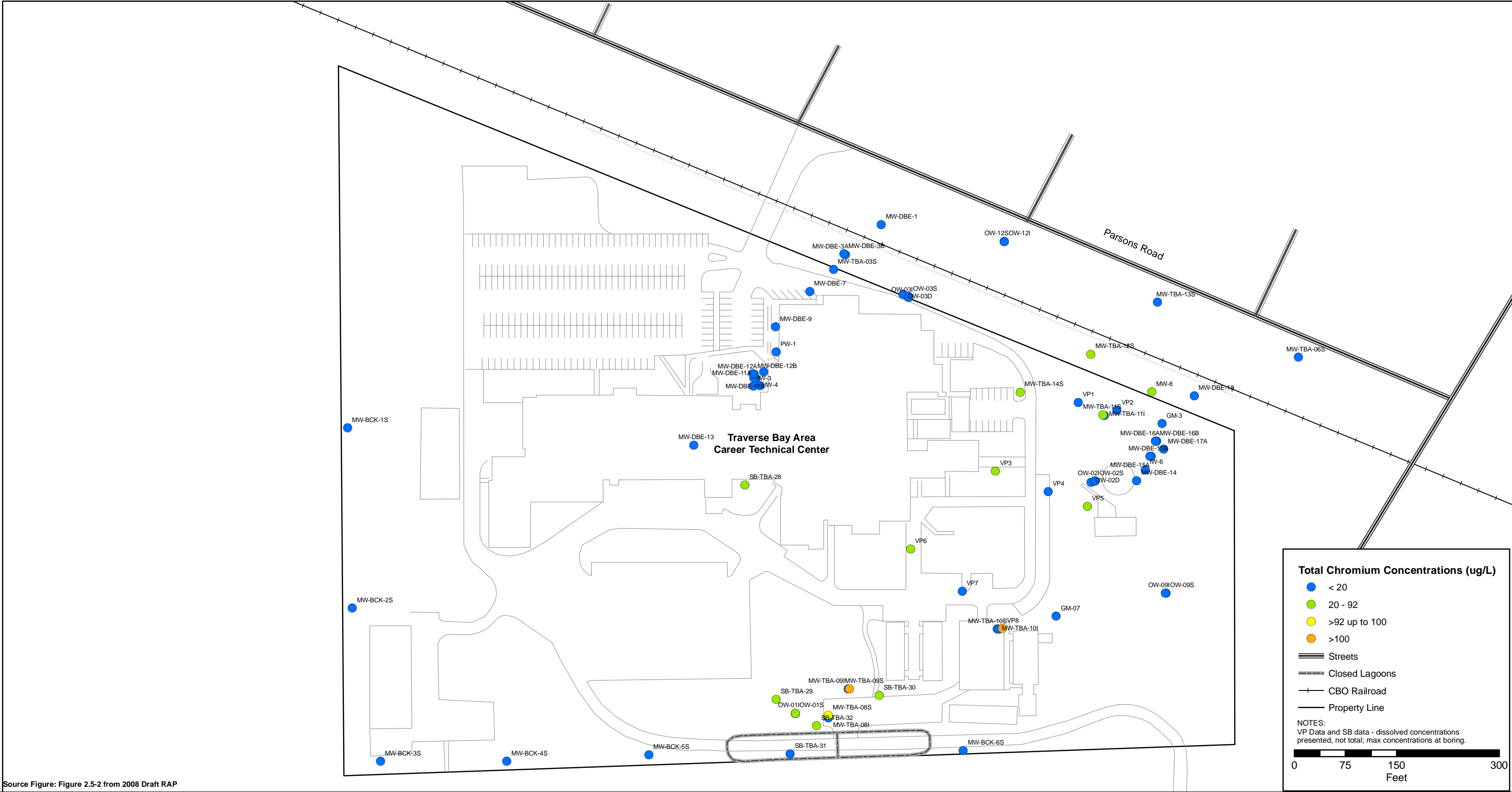
DATE: 12/12/2013 DRWN: H.K.M.

FIGURE 3-1

Path: J:\Rem_Eng\Project Files\AK Steel\0076-045 AK Steel\GIS\Projects\RAP\2013_12\Figure 3-2 East Plume_PCE.mxd

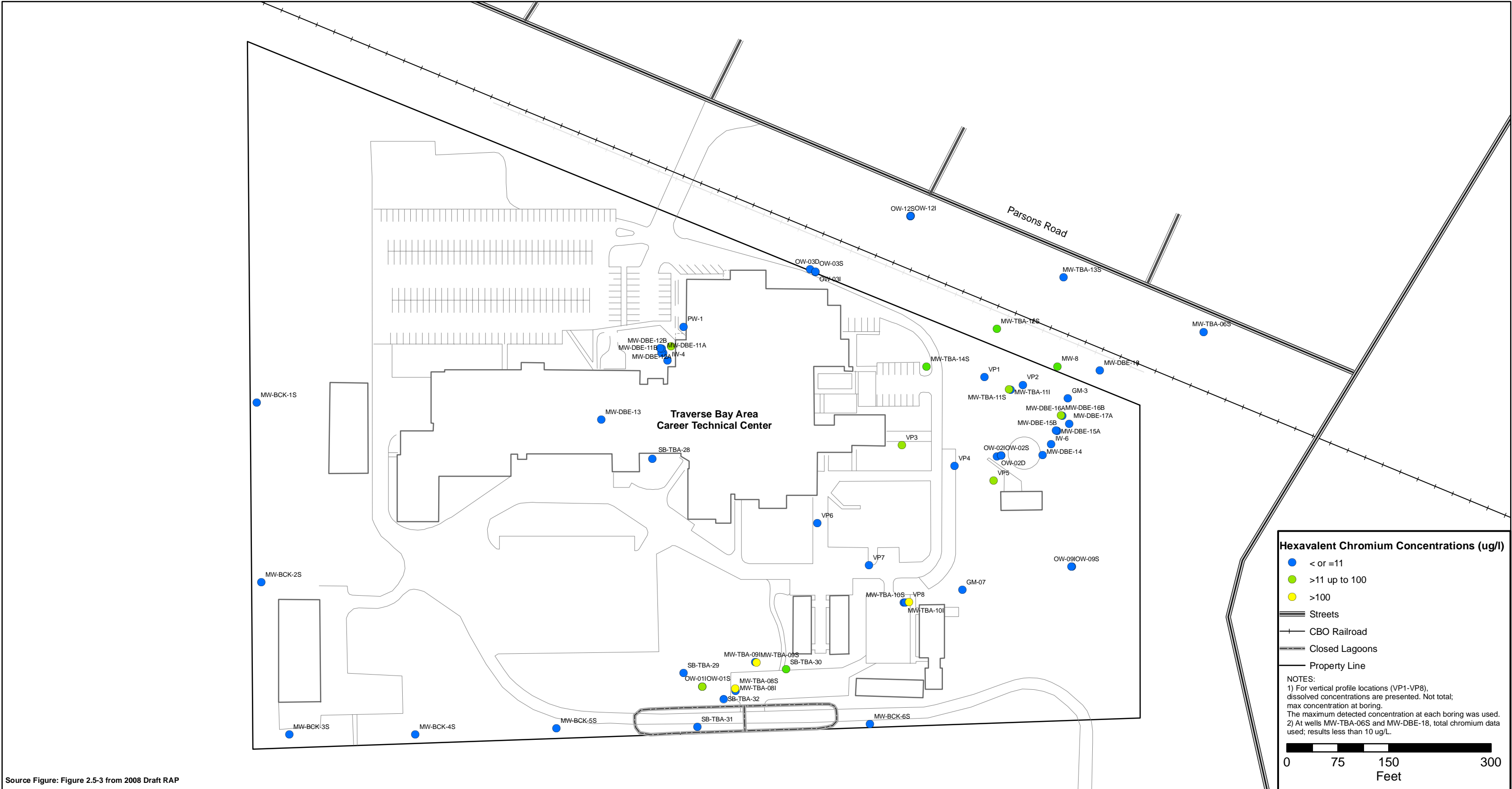






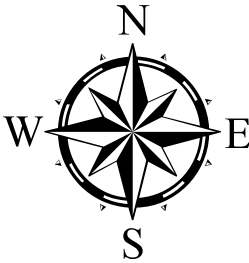
Source Figure: Figure 2.5-2 from 2008 Draft RAP

Figure Number:	Maximum Total Chromium Concentrations in Groundwater August 2005 - May 2008 Pine Grove Subdivision Site Traverse Bay Area Career Technical Center Traverse City, Michigan			 AECOM Environment 2 TECHNOLOGY PARK DRIVE WESTFORD, MA 01886 PHONE: (978) 589-3000 WEB: WWW.ENSUR.AECOM.COM	Designed By:	Revisions			
3-4	Scale:	Date:	Project Number:			No.:	Description:	Date:	By:
Sheet Number:	1" = 200'	11/2013	60287589						
1					Drawn By:				
					MH				
					Checked By:				
					CW				
					Approved By:				

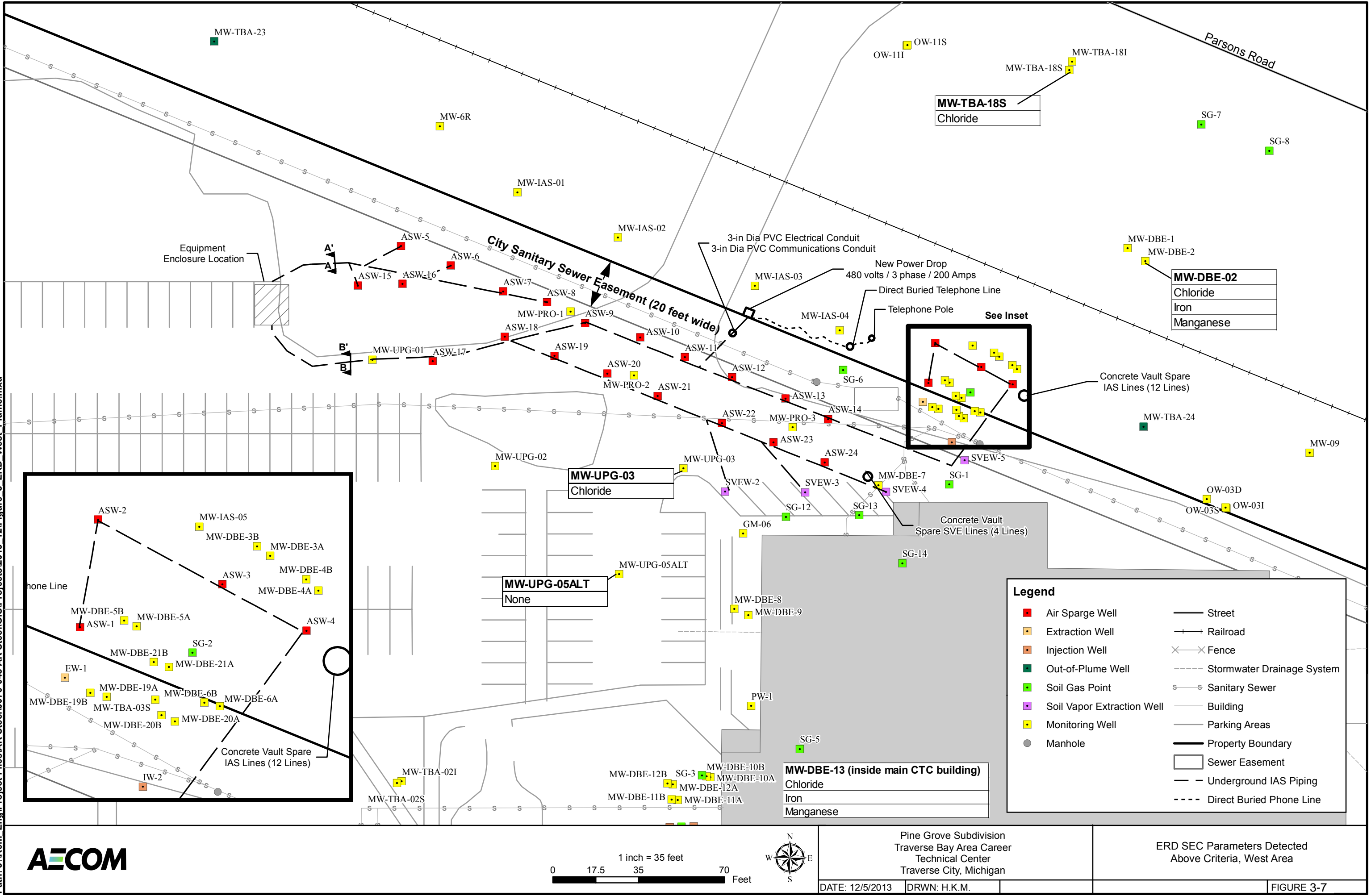


Source Figure: Figure 2.5-3 from 2008 Draft RAP

Figure Number:	Maximum Hexavalent Chromium Concentration; January 2006 - May 2008 Pine Grove Subdivision Site Traverse Bay Area Career Technical Center Traverse City, Michigan			 AECOM ENVIRONMENT 2 TECHNOLOGY PARK DRIVE WESTFORD, MA 01886 PHONE: (978) 589-3000 WEB: WWW.ENSRAECOM.COM	Designed By:	Revisions				
3-5	Scale:	Date:	Project Number:		No.:	Description:	Date:	By:		
Sheet Number:	1" = 200'	11/2013	60287589							
1										



Path: J:\Rem Eng\Project Files\AK Steel\GIS\Projects\2013 12\Figure 3 ERD West Plume.mxd

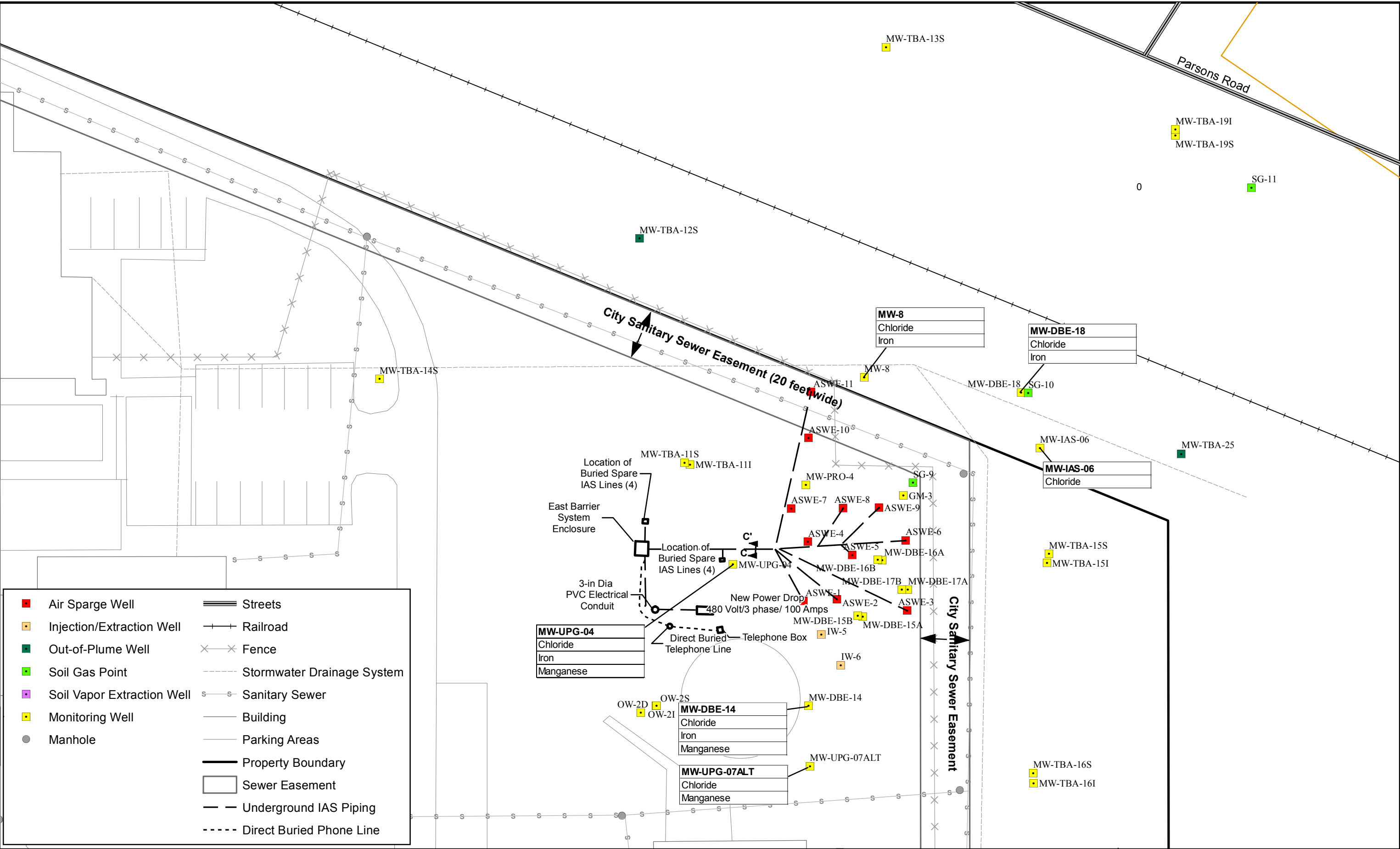


Pine Grove Subdivision
Traverse Bay Area Career
Technical Center
Traverse City, Michigan

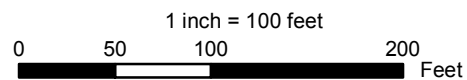
DATE: 12/5/2013 | DRWN: H.K.M.

ERD SEC Parameters Detected
Above Criteria, West Area

Path: J:\Rem_Eng\Project Files\AK Steel\GIS\Projects\2013_12\Figure 4 ERD East Area.mxd



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Pine Grove Subdivision
Traverse Bay Area Career
Technical Center
Traverse City, Michigan

DATE: 11/22/2013 DRWN: H.K.M.

Infiltration/Exposure Barrier
and Permanent Markers

FIGURE 4-1

Legend

- Railroad
- Infiltration/Exposure Barrier
- Driveway
- Property Line

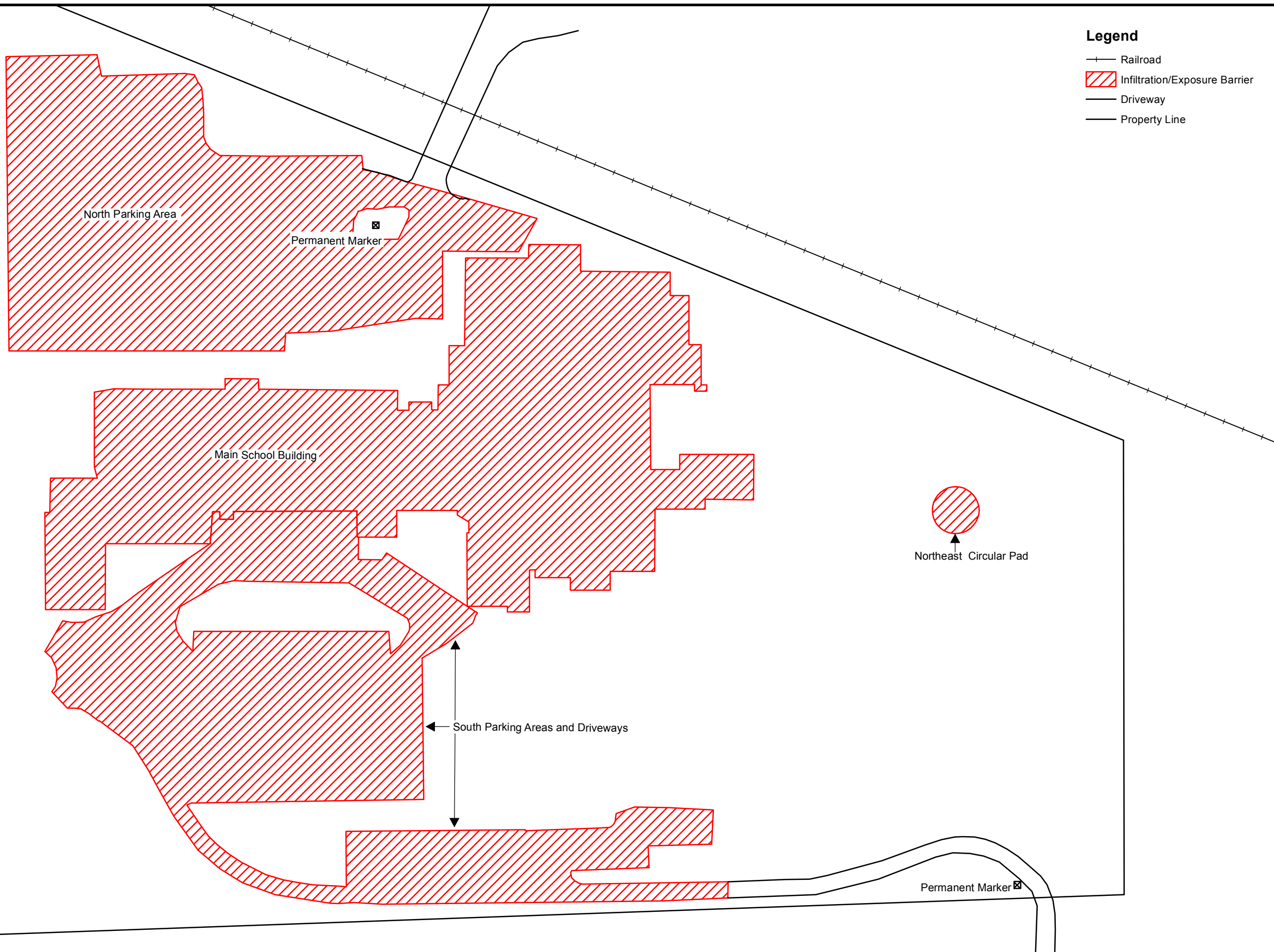
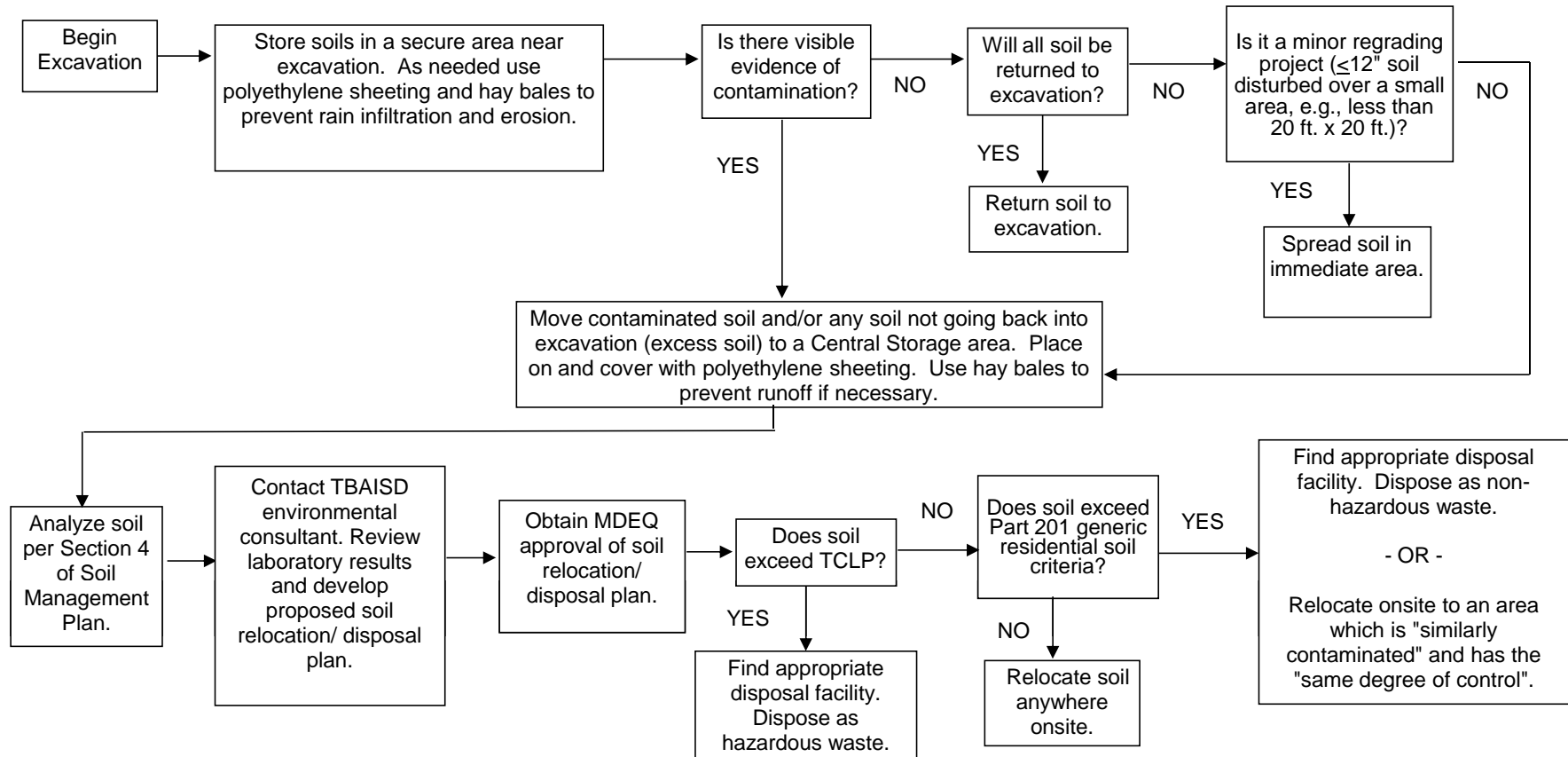
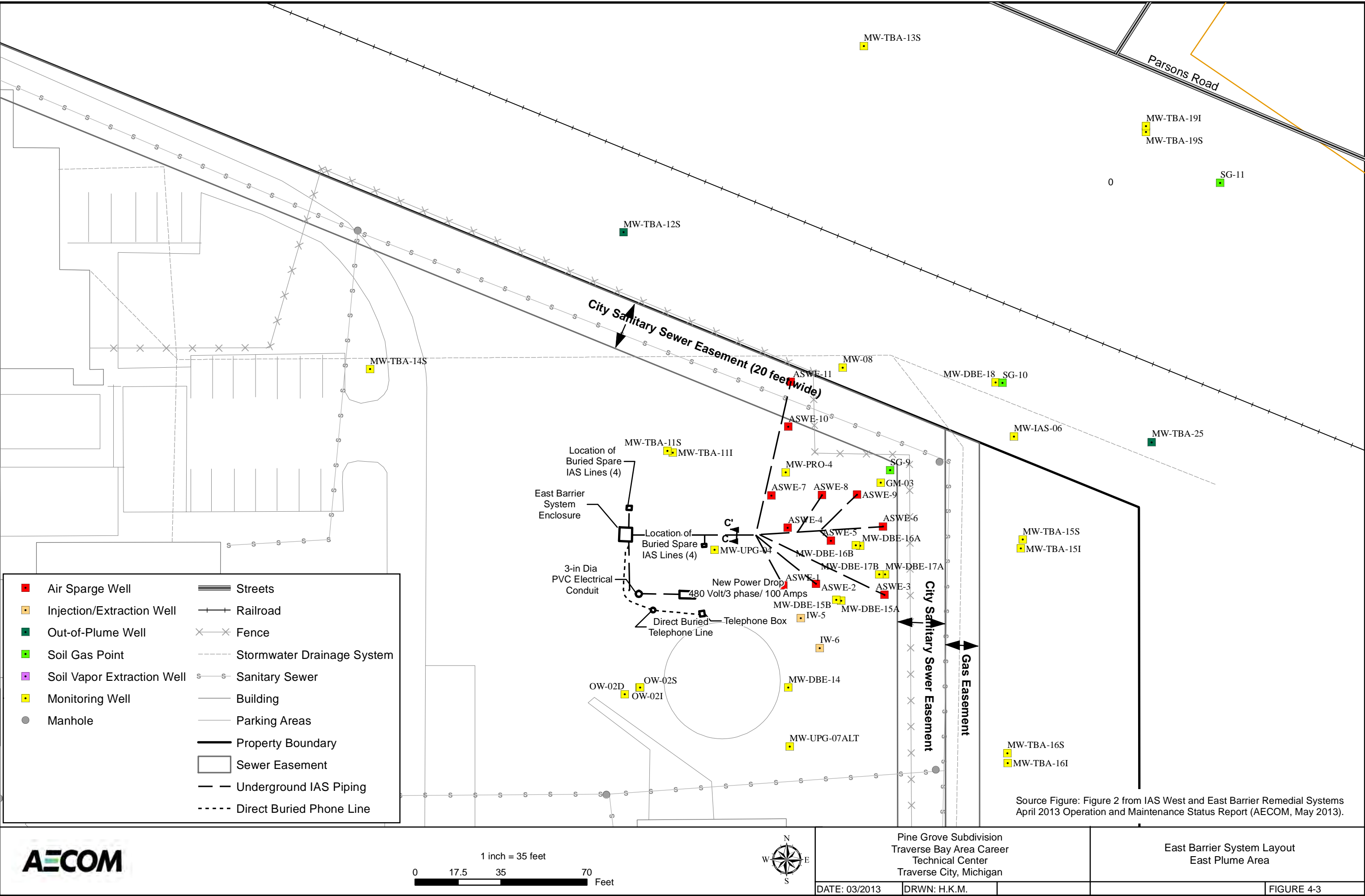


Figure 4-2: TBA Career Tech Center Soil Management Flowchart



Path: J:\Rem_Eng\Project Files\AK Steel\GIS\Projects\Due Care Plan\Figure 4-3.mxd



Source Figure: Figure 2 from IAS West and East Barrier Remedial Systems April 2013 Operation and Maintenance Status Report (AECOM, May 2013).



Pine Grove Subdivision
Traverse Bay Area Career
Technical Center
Traverse City, Michigan

East Barrier System Layout
East Plume Area

DATE: 03/2013

DRWN: H.K.M.

FIGURE 4-3

Appendix A

Restrictive Covenant



8 1 0 0 5 2 7
Tx:4044119

2012R-18858
STATE OF MICHIGAN
GRAND TRAVERSE COUNTY
RECORDED
10/08/2012 11:29 AM PAGE 1 OF 24
PEGGY HAINES REGISTER OF DEEDS

DECLARATION OF RESTRICTIVE COVENANT

DEQ Reference No: RC-RRD-201-11-023

This Declaration of Restrictive Covenant ("Restrictive Covenant") has been recorded with the Grand Traverse County Register of Deeds for the purpose of protecting public health, safety, and welfare, and the environment by prohibiting or restricting activities that could result in unacceptable exposure to environmental contamination present at the property located at 880 Parsons Road, Traverse City, Grand Traverse County, Michigan and legally described in Exhibit 1 attached hereto ("Property").

Response activities are being implemented to address environmental contamination at the Property pursuant to Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA), MCL 324.20101 *et seq.* The response activities that are being implemented to address environmental contamination are fully described in the Response Activity Plan titled Pine Grove Subdivision Site, Traverse City, Michigan, Remedial Action Plan dated January 2012, and prepared by AECOM on behalf of AK Steel Corporation and Traverse Bay Area Intermediate School District. The Michigan Department of Environmental Quality (DEQ) approved the Response Activity Plan on September 21, 2012, pursuant to Part 201 of the NREPA.

The Property described contains hazardous substances in excess of the concentrations developed as the unrestricted residential criteria under Section 20120a(1)(a) or (17) of the NREPA. The DEQ recommends that prospective purchasers or users of the Property undertake appropriate due diligence prior to acquiring or using this Property, and undertake appropriate actions to comply with the requirements of Section 20107a of the NREPA.

The response activities required the recording of this Restrictive Covenant with the Grand Traverse County Register of Deeds to: 1) restrict unacceptable exposures to hazardous substances located on the Property; 2) assure that the use of Property is consistent with the exposure assumptions used to develop the Residential cleanup criteria under Section 20120a(1)(a) of the NREPA and the exposure control measures relied upon at the Property; and 3) to prevent damage or disturbance of any element of the response activity constructed on the Property.

The restrictions contained in this Restrictive Covenant are based upon information available at the time the response activities were implemented. Failure of the response activities to achieve and maintain the criteria, exposure controls, and any requirements specified by the response activities; future changes in the environmental condition of the Property or changes in the Residential cleanup criteria under Section 20120a(1)(a) of the NREPA; the discovery of environmental conditions at the Property that were not accounted for during implementation of the response activities; or use of the Property in a manner inconsistent with the restrictions

described herein, may result in this Restrictive Covenant not being protective of public health, safety, and welfare, and the environment.

Exhibit 2 provides a survey of the Property that is subject to the groundwater restrictions specified herein. The "*Limits of Land Use Restrictions*," attached hereto as Exhibit 3, provides the legal description(s) and survey that distinguish those portions of the Property that are subject to the additional land use restrictions as specified in this Restrictive Covenant.

Definitions

For the purposes of this Restrictive Covenant, the following definitions shall apply:

"DEQ" means the Michigan Department of Environmental Quality, its successor entities, and those persons or entities acting on its behalf.

"Owner" means at any given time the then current title holder of the Property or any portion thereof.

All other terms used in this document which are defined in Part 3, Definitions, of the NREPA; Part 201 of the NREPA; or the Part 201 Administrative Rules, 2002 Michigan Register; Effective December 21, 2002, shall have the same meaning in this document as in Parts 3 and 201 of the NREPA and the Part 201 Administrative Rules, as of the date of filing of this Restrictive Covenant.

Summary of Response Activities

Hazardous substances in the soil and groundwater at the Property include volatile organic compounds (VOCs) and inorganic constituents. Prior to recording of this Restrictive Covenant, response activities have been undertaken to address sources of contamination (where known).

The constituents that remain in groundwater above the Michigan Part 201 generic drinking water criteria [R 299.5744] and that require controls to prevent unacceptable exposure are acetic acid, aluminum, chloride, chromium, cis-1,2-dichloroethene, iron, lead, manganese, sodium, tetrachloroethylene, thallium, trichloroethylene, and vinyl chloride. These controls are comprised of restrictions on use of groundwater underlying the Property that prohibit the installation or utilization, or allow, permit or provide for the installation or utilization of a well on the Property.

Further, VOC and inorganic constituents remain in soil at the Property. At the time this Restrictive Covenant was recorded, soils beneath the existing building and certain paved parking areas, depicted on Exhibit 3 as North parking area, Main school building, South parking area and driveway, and Northeast circular pad, had not been fully characterized. Based upon historic data, it is known that there are one or more areas of VOC or inorganic impacts to soil. Constituents showing potential exceedances of drinking water protection criteria in soil include: bromomethane, dichloromethane, and tetrachloroethylene. These VOCs and certain inorganic constituents remain at levels in the soil that require controls to minimize the soil to groundwater pathway. Since the soils beneath the entire footprint of the building and paved parking areas have not been investigated, it is not known if other impacts to soil exist. To be protective of human health from the unknown conditions, the Remedial Action Plan establishes that the

existing building and paved parking areas are a presumptive component of the remedial action that serves as an infiltration barrier and exposure barrier.

NOW THEREFORE,

1. Declaration of Land Use or Resource Use Restrictions

Traverse Bay Area Intermediate School District, as the Owner of the Property, hereby declares and covenants that the Property shall be subject to the following restrictions and conditions:

a. Prohibited Activities to Eliminate Unacceptable Exposure to Hazardous Substances and to Ensure the Effectiveness and Integrity of the Response Activity. The Owner shall prohibit activities on the Property that may result in exposures to hazardous substances and activities that may interfere with any element of the response activities, including the performance of operation and maintenance activities, monitoring, or other measures necessary to ensure the effectiveness and integrity of the response activities implemented at the Property. These prohibited activities include:

1. The construction and use of wells or other devices on the Property to extract groundwater for consumption, irrigation, or any other purpose, except as provided below:

(a) Wells and other devices constructed as part of a response activity for the purpose of evaluating groundwater quality or to remediate subsurface contamination associated with a release of hazardous substances into the environment are permitted provided the construction of the wells or devices complies with all applicable local, state, and federal laws and regulations and does not cause or result in a new release, exacerbation of existing contamination, or any other violation of local, state, or federal laws or regulations.

(b) Short-term dewatering for construction purposes is permitted provided the dewatering, including management and disposal of the groundwater, is conducted in accordance with all applicable local, state, and federal laws and regulations and does not cause or result in a new release, exacerbation of existing contamination, or any other violation of local, state, and federal environmental laws and regulations.

2. The Main School Building at the location shown in Exhibit 3 as Parcel B serves to prevent exposures to contaminated soils and infiltration of water through contaminated soil at the Property. Any excavation or other intrusive activity that could affect the integrity of the barrier provided for by the building is prohibited, except during short-term construction or repair projects or for purposes of further treating or remediating the subject contamination. Any excavation or other intrusive activity, including removing, altering, or disturbing the Main School Building, that could affect the integrity of the barrier, must include the use of engineering controls to prevent the infiltration of water into the contaminated soil underlying the barrier until the barrier is repaired or replaced. The barrier must be repaired or replaced with a cover that provides at least an equivalent degree of protection as the original barrier within 14 days of completion of the work. Repair and/or replacement of the barrier must be completed unless additional sampling is conducted that

demonstrates that a barrier in the area is no longer necessary in accordance with the applicable provisions and requirements of Part 201 of the NREPA.

3. The asphalt and concrete paved areas that have base elevations of 603.03 ft (Parcel A), 601.08 ft (Parcel C), 601.07 ft (Parcel D), 602.03 ft (Parcel E) and 600.51 ft (Parcel F) at the locations shown in Exhibit 3 as North parking area (Parcel A), South parking areas and driveways (Parcels C, D, and E), and Northeast circular pad (Parcel F) serve to prevent exposures to contaminated soils and infiltration of water through contaminated soil at the Property. Any excavation or other intrusive activity that could affect the integrity of the asphalt and concrete paved areas is prohibited, except during short-term construction or repair projects or for purposes of further treating or remediating the subject contamination. Any excavation or other intrusive activity, including removing, altering, or disturbing the asphalt and concrete paved areas, that could affect the integrity of the barrier, must include the use of engineering controls to prevent the infiltration of water into the contaminated soil underlying the barrier until the barrier is repaired or replaced. The barrier must be repaired or replaced with a cover that provides at least an equivalent degree of protection as the original barrier within 14 days of completion of the work. Repair and/or replacement of the barrier must be completed unless additional sampling is conducted that demonstrates that a barrier in the area is no longer necessary in accordance with the applicable provisions and requirements of Part 201 of the NREPA.

b. Contaminated Soil Management. The Owner shall manage all soils, media and/or debris located on the Property in accordance with the applicable requirements of Section 20120c of the NREPA; Part 111, Hazardous Waste Management, of the NREPA; Subtitle C of the Resource Conservation and Recovery Act, 42 U.S.C. Section 6901 *et seq.*; the administrative rules promulgated thereunder; and all other relevant state and federal laws.

2. Permanent Markers. The Owner shall not remove, cover, obscure, or otherwise alter or interfere with the permanent markers placed at the locations noted in Exhibit 3. The Owner shall keep vegetation and other materials clear of the permanent markers to assure that the markers are readily visible.

3. Access. The Owner grants to the DEQ and its designated representatives the right to enter the Property at reasonable times for the purpose of determining and monitoring compliance with the response activities, including the right to take samples, inspect the operation of the response activities and inspect any records relating thereto, and to perform any actions necessary to maintain compliance with Part 201.

4. Conveyance of Property Interest. The Owner shall provide notice to the DEQ of the Owner's intent to transfer any interest in the Property at least fourteen (14) business days prior to consummating the conveyance. A conveyance of title, easement, or other interest in the Property shall not be consummated by the Owner without adequate and complete provision for compliance with the applicable provisions of Section 20116 of the NREPA. The notice required to be made to the DEQ under this Paragraph shall be made to: Chief, Remediation Division, Michigan DEQ, P.O. Box 30426, Lansing, Michigan 48909-7926; and shall include a statement that the notice is being made pursuant to the requirements of this Restrictive Covenant, DEQ Reference Number RC-RRD-201-09-002. A copy of this Restrictive Covenant shall be provided to all future owners, heirs, successors, lessees, easement holders, assigns, and transferees by the person transferring the interest.

5. Term of Restrictive Covenant. This Restrictive Covenant shall run with the Property and shall be binding on the Owner; future owners; and their successors and assigns, lessees, easement holders, and any authorized agents, employees, or persons acting under their direction and control. This Restrictive Covenant shall continue in effect until the DEQ or its successor determines that hazardous substances no longer present an unacceptable risk to the public health, safety, or welfare, or the environment. This Restrictive Covenant may only be modified or rescinded with the written approval of the DEQ.

6. Enforcement of Restrictive Covenant. The State of Michigan, through the DEQ, AK Steel Corporation and Traverse Bay Area Intermediate School District may individually enforce the restrictions set forth in this Restrictive Covenant by legal action in a court of competent jurisdiction.

7. Severability. If any provision of this Restrictive Covenant is held to be invalid by any court of competent jurisdiction, the invalidity of such provision shall not affect the validity of any other provisions hereof, and all such other provisions shall continue unimpaired and in full force and effect.

8. Authority to Execute Restrictive Covenant. The undersigned person executing this Restrictive Covenant is the Owner, or has the express written permission of the Owner and all other holders of a legal interest whose interest is materially affected by this Restrictive Covenant as documented and attached hereto as Exhibit 4, and represents and certifies that he or she is duly authorized and has been empowered to execute and deliver this Restrictive Covenant

IN WITNESS WHEREOF, Traverse Bay Area Intermediate School District has caused this Restrictive Covenant, RC-RRD-201-11-023, to be executed on this 8 day of October, 2012.

Traverse Bay Area Intermediate School District

By: Michael J. Hill
Signature

Name: Michael J. Hill
Print or Type Name

Its: Superintendent
Title

STATE OF MICHIGAN
COUNTY OF GRAND TRAVERSE

The foregoing instrument was acknowledged before me this Oct. 8th of 2012, by Michael J. Hill, the Superintendent of Traverse Bay Area Intermediate School District, on behalf of the Traverse Bay Area Intermediate School District.

Shauna Janowiak
Notary Public Signature

Notary Public, State of Michigan
County of Grand Traverse

My Commission Expires: 3-29-18
Acting in the County of Grand Traverse



Prepared by and when recorded return to:

Steven M. Wesloh, Esq.
Frost Brown Todd LLC
2200 PNC Center
201 East Fifth Street
Cincinnati, Ohio 45202-4182

EXHIBIT 1

LEGAL DESCRIPTION OF PROPERTY

That part of the Southwest quarter of Section 7, Town 27 North, Range 10 West, lying South of the Pere Marquette Railroad right of way, more fully described as: Beginning at the South quarter corner of said section 7; thence North 1 degree 33'40" East; 1039.73 feet along the North and South Quarter line of said Section 7 to the South right of way line of the Pere Marquette Railroad; thence South 65 degrees 53'20" East, 1417.18 feet along said right of way line to the East eighth line of said Section 7; thence South 1 degree 53'40" West 459.40 feet along said East eighth line to the South line of said Section 7; thence South 89 degrees 55'40" West, 1306.36 feet along said Section line to the Point of Beginning

Parcel identification number 51-007-004-50.

EXHIBIT 2

**SURVEY OF THE PROPERTY FOR GROUNDWATER RESTRICTIONS DETAILED IN
SECTION 1 OF THIS RESTRICTIVE COVENANT**

Note: The entire Property is subject to the stated groundwater restrictions.



Legend

- | | |
|---|-----------|
|  | Concrete |
|  | Asphalt |
|  | Buildings |

- Property Boundary Area Subject to Groundwater Restriction

PROPERTY BOUNDARY

SW COR GOV'T LOT 7
SEC. 7, T27N, R10W

[illegible]

gfa **Gourdie-Fraser**
Planning | Development | Transportation

Groundwater Restrictions

Groundwater Restrictions detailed in Section 1.a.1 of this restrictive covenant apply to the entire property. The legal description for the area covered by the groundwater restrictions is as follows:

That part of the Southwest quarter of Section 7, Town 27 North, Range 10 West, lying South of the Pere Marquette Railroad right of way, more fully described as: Beginning at the South quarter corner of said section 7; thence North 1 degree 33'40" East; 1039.73 feet along the North and South Quarter line of said Section 7 to the South right of way line of the Pere Marquette Railroad; thence South 65 degrees 53'20" East, 1417.18 feet along said right of way line to the East eighth line of said Section 7; thence South 1 degree 53'40" West 459.40 feet along said East eighth line to the South line of said Section 7; thence South 89 degrees 55'40" West, 1306.36 feet along said Section line to the Point of Beginning

Parcel identification number 51-007-004-50.

EXHIBIT 3

"LIMITS OF LAND USE RESTRICTIONS"

**LEGAL DESCRIPTION AND SURVEY OF THE EXPOSURE AND INFILTRATION BARRIER
SUBJECT TO RESTRICTIONS DETAILED IN SECTION 1 OF THIS RESTRICTIVE
COVENANT**

LINE	LENGTH	BEARING
L1	129.45	N85.10.20"E
L2	12.76	S04.10.44"E
L3	13.71	N69.20.17"E
L4	29.33	S85.47.45"E
L5	42.09	S68.48.55"E
L6	17.79	S70.35.31"E
L7	8.42	S04.38.00"E
L8	36.74	S01.02.42"E
L9	12.90	N87.53.50"E
L10	22.32	N87.18.30"E
L11	31.81	N85.28.43"E
L12	24.04	N82.63.37"E
L13	10.17	N81.22.16"E
L14	3.56	S63.24.43"W
L15	99.87	S76.35.39"E
L16	8.43	S73.06.42"E
L17	19.90	S77.28.04"E
L18	1.78	M16.56.56"E
L19	64.51	S74.52.59"E
L20	19.10	S16.04.37"W
L21	16.87	N73.55.52"E
L22	0.98	N09.21.19"E
L23	11.64	N73.16.28"W
L24	21.80	S48.27.30"W
L25	26.92	S89.27.32"W
L26	44.58	N89.53.22"W
L27	74.14	S00.09.16"E
L28	33.92	N85.58.53"W
L29	0.96	S04.10.28"W
L30	29.81	N89.59.56"W
L31	71.90	N00.16.44"W
L32	13.93	N89.01.35"W
L33	72.44	S00.24.41"W
L34	12.20	N86.49.51"W
L35	25.38	S86.36.47"E
L36	7.72	S02.35.55"E
L37	42.08	S88.41.53"W
L38	8.79	S01.49.59"E
L39	8.01	S01.08.43"E
L40	255.39	N89.29.37"W
L67	198.23	N01.25.30"W
L68	31.01	N03.02.59"E
L69	67.72	N02.14.54"W
L70	20.45	N07.33.35"W
L71	20.75	N84.40.30"E
L72	23.64	N84.29.37"E
L73	13.13	S73.58.76"E
L74	31.95	S76.50.49"W
L75	11.22	S68.44.08"W
L76	11.21	S88.57.05"W
L77	4.51	N42.33.35"E
L78	222.04	N89.37.47"E
L79	98.48	N00.02.04"W
L80	5.07	N89.57.56"E
L81	34.52	N00.54.50"W
L82	48.20	S89.55.31"E
L83	11.14	N00.02.04"W
L84	3.00	S88.57.56"W
L85	76.03	N00.02.04"W
L86	19.72	N89.24.17"E
L87	2.50	N05.02.04"W

L88	111.30	N89.57.56"E
L89	10.64	N00.02.04"W
L90	34.06	S88.35.20"E
L91	10.71	S01.10.37"E
L92	135.40	N89.57.56"E
L93	20.21	S00.02.04"E
L94	12.64	N89.57.56"E
L95	7.34	N00.02.04"W
L96	20.00	N89.57.56"E
L97	7.34	S00.02.04"E
L98	8.22	N89.57.56"E
L99	26.55	N00.02.04"W
L100	11.67	N89.57.56"E
L101	39.67	N80.02.04"W
L102	18.60	N89.57.56"E
L103	7.36	N00.02.04"W
L104	2.68	S89.57.56"W
L105	82.00	N00.02.04"W
L106	64.39	S89.57.40"E
L107	12.64	N00.02.04"W
L108	52.37	N89.57.56"E
L109	27.88	S00.24.04"E
L110	90.05	N89.57.56"E
L111	1.30	S00.02.04"E
L112	0.68	S89.57.56"W
L113	0.68	N00.02.04"W
L114	14.40	S89.57.56"W
L115	24.00	S00.02.04"E
L116	40.05	N89.57.56"E
L117	41.94	S00.02.49"W
L118	2.70	S89.57.56"W
L119	7.37	S00.02.04"E
L120	14.76	N89.57.56"E
L121	36.95	S00.29.32"E
L122	4.50	N89.57.56"E
L123	7.37	S00.02.04"E
L124	12.33	S89.57.56"W
L125	7.68	N00.02.04"W
L126	44.20	S89.57.56"W
L127	91.26	S00.02.04"E
L128	30.67	N89.57.56"E
L129	15.30	N00.02.04"W
L130	75.28	N89.57.56"E
L131	45.76	S00.03.00"W
L132	50.48	S89.38.23"W
L133	8.70	S00.02.04"E
L134	53.90	S89.57.56"W
L135	51.13	S00.02.04"E
L136	44.86	N88.47.56"W
L137	19.30	S89.57.56"W
L138	18.00	S89.57.56"W
L139	6.50	N00.02.04"W
L140	22.08	S89.57.56"W
L141	12.60	N00.02.04"W
L142	35.77	S89.57.56"W
L143	1.80	N00.02.04"W
L144	6.07	S89.57.56"W
L145	43.24	S00.02.04"E
L146	21.56	S89.26.21"W
L147	7.87	N00.02.04"W
L148	42.57	S89.57.56"W
L149	73.00	N89.02.04"W
L150	2.45	N89.57.56"E

L151	10.70	N00.02.04"W
L152	0.36	S89.57.56"W
L153	0.51	N00.02.04"W
L154	12.77	N57.51.57"W
L155	0.60	S89.57.56"W
L156	4.03	N00.02.04"W
L157	61.24	S89.57.56"W
L158	23.97	S00.02.04"E
L159	39.86	S89.53.07"W
L160	26.39	N00.14.17"E
L161	12.66	S89.57.56"W
L162	8.18	S00.02.04"E
L163	14.05	S89.57.56"W
L164	8.17	N00.02.04"W
L165	10.00	S89.57.56"W
L166	33.66	S00.02.04"E
L167	99.66	S89.56.22"W
L168	68.14	S00.02.04"E
L169	60.75	S89.57.56"W
L170	127.48	N53.59.30"E
L171	15.13	N88.23.44"E
L172	13.49	N89.47.43"W
L173	23.39	N01.32.13"W
L174	17.75	S17.20.32"E
L175	20.53	S27.19.21"W
L176	100.82	S58.42.03"E
L177	26.75	S31.08.23"E
L178	7.54	S62.00.32"E
L179	22.83	S27.30.34"W
L180	29.96	N65.07.17"W
L181	8.55	N19.44.53"E
L182	42.07	N57.55.95"W
L183	46.04	N88.50.07"W
L184	103.88	S88.56.07"W
L185	28.02	S27.17.54"W
L186	97.88	S57.52.32"E
L187	23.78	S34.46.42"W
L188	25.76	S19.39.46"W
L189	15.37	S14.12.03"W
L190	6.63	S15.17.39"W
L191	32.99	N55.45.01"W
L192	11.28	N41.22.14"E
L193	8.21	N21.25.50"E
L194	19.33	N49.48.95"W
L195	73.41	N28.17.48"W
L196	53.22	N55.12.44"W
L197	14.37	N27.18.19"W
L198	60.16	N57.57.32"E
L199	7.88	S10.00.05"E
L200	41.55	S37.38.12"E
L201	19.77	N00.27.49"E
L202	20.51	N89.53.53"E
L203	18.78	S02.31.45"E
L204	13.94	N50.15.11"E
L205	10.55	S53.42.44"W
L206	14.63	S01.53.38"E
L207	237.09	S89.29.58"W
L208	23.72	S61.44.47"W
L209	23.47	N50.10.40"E
L210	21.21	S89.28.37"W
L211	16.67	N61.44.47"E
L212	24.48	S34.42.26"E
L241	24.01	N89.26.24"E

L242	57.38	N00.16.11"W
L243	181.42	N88.29.31"E
L244	1.14	S09.33.10"E
L245	59.69	N87.31.24"E
L246	7.27	S08.21.59"W
L247	19.64	N70.10.32"E
L248	35.50	S88.53.13"E
L249	44.73	S87.02.18"E
L250	34.67	S03.09.29"W
L251	64.37	S89.42.23"W
L252	22.28	S02.40.33"E
L253	78.47	S87.58.44"W
L254	147.14	N89.05.55"E
L255	16.23	S00.28.25"W
L256	196.13	S88.54.51"W
L257	42.69	N67.21.36"W
L258	15.84	N33.01.30"W
L259	38.10	S26.53.08"W
L260	24.41	N88.54.08"E

CURVE	LENGTH	RADIUS	DELTA	CHORD
C1	6.99	3.49	114.4331°	581.36.24"E
C2	85.08	50.79	62.07.59°	N39.18.44"W
C3	6.56	4.51	80.92.41°	S41.45.35"E
C4	7.34	6.38	63.44.22°	S47.04.35"W
C5	10.93	47.26	13.16.49°	S88.59.28"W
C6	9.66	7.54	73.33.58°	N48.00.24"E
C7	11.28	12.39	25.08.45°	S88.00.44"E
C8	15.12	33.71	22.01.36°	N48.18.53"W
C9	6.44	16.74	27.01.36°	N48.18.53"W
C10	15.12	33.71	22.01.36°	N48.18.53"W
C11	6.44	16.74	27.01.36°	N48.18.53"W
C12	24.13	8.23	187.57.81°	S07.94.28"W
C13	51.61	87.69	33.43.88°	N71.01.27"E
C14	16.37	9.03	103.93.00°	N30.05.21"E
C15	4.31	2.67	92.15.48°	S00.10.06"E
C16	14.37	12.90	63.46.00°	M16.23.15"W
C17	10.63	7.07	86.07.52°	S68.08.38"W
C18	140.56	148.89	34.05.96°	S68.31.44"E
C19	140.56	148.89	34.05.96°	S68.31.44"E
C20	10.23	10.22	57.21.36°	N44.39.43"E
C21	8.16	7.56	66.26.10°	S03.15.45"E
C22	12.08	21.25	32.35.07°	S61.56.02"E
C23	148.75	161.57	57.45.05°	S89.27.59"E


BN	ELEVATION	DESCRIPTION
BN-A	602.03	NW CORNER OF NORTH PARKING LOT
BN-B	601.08	BASE OF LIGHT POLE ON THE NORTH SIDE OF SOUTH PARKING AREA DRIVEWAY
BN-C	601.07	NW CORNER OF SOUTH PARKING AREA
BN-D	602.03	SOUTH END OF BIT DRIVE ON NORTH SIDE OF SOUTH DRIVEWAY AND PARKING
BN-F	600.51	CENTER OF HELICOPTER PAD

Parcel "A"

PARCEL "A" (North Parking Area)

Part of the Southeast 1/4 of Section 7, Town 27 North, Range 10 West,
City of Traverse City, Grand Traverse County, Michigan, more fully described as
follows;

Commencing at the South 1/4 corner of said Section 7;
thence North 00°22'13" West, 893.04 feet,
along the North and South 1/4 line of said Section 7;
thence North 89°37'47" East, 180.04 feet,
along a line perpendicular to the said North and South 1/4 line, and to the
Point of Beginning;
thence North 89°10'20" East, 129.46 feet;
thence South 04°10'44" East, 12.76 feet;
thence southeasterly, 6.99 feet, along the arc of a 3.49 foot radius curve to
the left, the central angle of is 114°43'51", and the long chord of which
bears
South 41°34'24" East, 5.88 feet;
thence North 89°20'17" East, 13.71 feet;
thence South 85°47'45" East, 29.33 feet;
thence South 68°46'55" East, 42.09 feet;
thence South 70°36'31" East, 17.79 feet;
thence southeasterly, 55.08 feet, along the arc of a 50.79 foot radius curve
to the right, the central angle of is 62°07'59", and the long chord of which
bears
South 39°18'40" East, 52.42 feet;
thence South 04°38'00" East, 8.42 feet;
thence South 01°02'42" East, 36.74 feet;
thence southeasterly, 6.96 feet, along the arc of a 4.51 foot radius curve to
the left, the central angle of is 88°22'41", and the long chord of which
bears
South 41°45'35" East, 6.29 feet;
thence North 87°53'50" East, 12.90 feet;
thence North 87°18'30" East, 22.32 feet;
thence North 85°28'43" East, 31.81 feet;
thence North 82°16'37" East, 24.04 feet;
thence North 81°22'16" East, 10.17 feet;
thence North 63°24'43" East, 3.56 feet;
thence South 76°35'39" East, 99.87 feet;
thence South 73°26'42" East, 8.43 feet;
thence South 77°28'04" East, 19.90 feet;
thence North 16°56'56" East, 1.78 feet;
thence South 74°52'39" East, 64.51 feet;
thence South 16°04'37" West, 19.10 feet;
thence North 73°35'52" West, 16.87 feet;
thence North 09°21'19" East, 0.98 feet;
thence North 73°16'28" West, 11.64 feet;
thence South 48°27'30" West, 21.80 feet;
thence South 89°27'32" West, 26.92 feet;
thence North 89°53'22" West, 44.58 feet;
thence South 00°09'16" East, 74.14 feet;
thence North 89°58'53" West, 33.92 feet;
thence South 04°10'29" West, 0.96 feet;
thence North 89°59'56" West, 29.81 feet;
thence North 00°16'44" West, 71.90 feet;
thence North 88°01'38" West, 13.93 feet;
thence South 00°24'41" West, 72.44 feet;
thence North 88°49'51" West, 12.20 feet;
thence South 86°36'47" West, 25.38 feet;
thence South 02°35'55" East, 7.72 feet;
thence South 88°41'53" West, 42.08 feet;
thence southwesterly, 7.34 feet, along the arc of a 6.38 foot radius curve to
the left, the central angle of is 65°54'22", and the long chord of which
bears

PH 231.946.5874 FAX 231.946.3703 WWW.gourdiefrazer.com 123 W. Front Street Traverse City, MI 49684	 Municipal Development Transportation	Location: TBA/PGS PROJECT SECTION 7, T27N, R10W EAST BAY TWP, GRAND TRAVERSE CO, MI	DATE: 07-31-08 PM GW DRN MF CK GW 05033L SH 1 of 2
THESE DOCUMENTS ARE PREPARED IN ACCORDANCE WITH THE TERMS AND CONDITIONS OF THE CONTRACT FOR THIS PROJECT			

Parcel "A"

South 40°10'35" West, 6.94 feet;
thence South 08°49'59" East, 8.79 feet;
thence South 01°08'43" East, 8.01 feet;
thence South 89°29'37" West, 255.39 feet;
thence South 89°29'37" West, 21.21 feet;
thence North 01°25'30" West, 198.23;
thence North 03°02'59" East, 31.01 feet;
thence North 02°14'34" West, 67.72 feet;
to the Point of Beginning.

Said Parcel contains 2.35 acres.


Excepting thereout

Part of the Southeast 1/4 of Section 7, Town 27 North, Range 10 West,
City of Traverse City, Grand Traverse County, Michigan, more fully described as
follows;

Commencing at the South 1/4 corner of said Section 7;
thence North 00°22'13" West, 717.17 feet,
along the North and South 1/4 line of said Section 7;
thence North 89°37'47" East, 536.86 feet,
along a line perpendicular to the said North and South 1/4 line, and to the
POINT OF BEGINNING;
said point also being the beginning of a curve to the left, of which the
radius point lies South 54°34'04" West, a radial distance of 33.71 feet;
thence northwesterly along the arc, through a central angle of 25°41'55",
a distance of 15.12 feet thence westerly, 6.44 feet, along the arc of a
16.74 foot radius curve to the left, the central angle of is 22°01'36",
and the long chord of which bears
North 69°29'56" West, 6.40 feet;
thence northerly, 24.13 feet, along the arc of a 8.23 foot radius curve to
the right, the central angle of is 167°57'18", and the long chord of which
bears
North 02°54'28" East, 16.37 feet;
thence North 84°40'30" East, 20.75 feet;
thence North 84°29'37" East, 23.64 feet;
thence easterly, 10.95 feet, along the arc of a 47.26 foot radius curve to
the right, the central angle of is 13°16'49", and the long chord of which
bears
North 89°59'26" East, 10.93 feet;
thence South 73°56'26" East, 13.13 feet;
thence South 16°50'49" West, 31.95 feet;
thence southwesterly, 9.66 feet, along the arc of a 7.54 foot radius curve
to the right, the central angle of is 73°23'58", and the long chord of which
bears
South 48°00'24" West, 9.01 feet;
thence South 89°44'08" West, 11.22 feet;
thence South 88°57'05" West, 11.21 feet;
thence northwesterly, 11.28 feet, along the arc of a 12.39 foot radius curve
to the right, the central angle of is 52°08'45", and the long chord of which
bears
North 66°00'43" West, 10.89 feet;
thence North 42°33'36" West, 4.51 feet;
to the Point of Beginning.

Said Parcel contains 0.0512 acres.

Said Parcel contains 2.30 acres net.

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			DRN MF CK GW
			SH 2 of 2
05033L			

THESE DOCUMENTS ARE PREPARED IN ACCORDANCE WITH THE TERMS AND CONDITIONS OF THE CONTRACT FOR THIS PROJECT.

Parcel "B"

PARCEL "B" (Main School Building)

Part of the Southeast 1/4 of Section 7, Town 27 North, Range 10 West,
City of Traverse City, Grand Traverse County, Michigan, more fully described as
follows;


Commencing at the South 1/4 corner of said Section 7;
thence North 00°22'13" West, 331.37 feet,
along the North and South 1/4 line of said Section 7;
thence North 89°37'47" East, 222.04 feet,
along a line perpendicular to the said North and South 1/4 line, and to the
Point of Beginning
thence North 00°02'04" West, 98.48 feet;
thence North 89°57'56" East, 5.07 feet;
thence North 00°54'50" West, 34.52 feet;
thence South 89°55'31" East, 48.20 feet;
thence North 00°02'04" West, 11.14 feet;
thence South 89°57'56" West, 3.00 feet;
thence North 00°02'04" West, 76.03 feet;
thence North 89°24'17" East, 19.72 feet;
thence North 00°02'04" West, 2.60 feet;
thence North 89°57'56" East, 111.30 feet;
thence North 00°02'04" West, 10.64 feet;
thence South 89°35'20" East, 34.06 feet;
thence South 01°10'37" East, 10.71 feet;
thence North 89°57'56" East, 135.40 feet;
thence South 00°02'04" East, 20.21 feet;
thence North 89°57'56" East, 12.64 feet;
thence North 00°02'04" West, 7.34 feet;
thence North 89°57'56" East, 20.00 feet;
thence South 00°02'04" East, 7.34 feet;
thence North 89°57'56" East, 8.22 feet;
thence North 00°02'04" West, 26.65 feet;
thence North 89°57'56" East, 11.67 feet;
thence North 00°02'04" West, 39.87 feet;
thence North 89°57'56" East, 18.60 feet;
thence North 00°02'04" West, 7.36 feet;
thence South 89°57'56" West, 2.68 feet;
thence North 00°02'04" West, 82.00 feet;
thence South 89°57'40" East, 64.39 feet;
thence North 00°02'04" West, 12.64 feet;
thence North 89°57'56" East, 52.37 feet;
thence South 00°24'04" East, 27.88 feet;
thence North 89°57'56" East, 90.05 feet;
thence South 00°02'04" East, 1.30 feet;
thence South 89°57'56" West, 0.68 feet;
thence North 00°02'04" West, 0.66 feet;
thence South 89°57'56" West, 14.40 feet;
thence South 00°02'04" East, 24.00 feet;
thence North 89°57'56" East, 40.05 feet;
thence South 00°02'49" West, 41.94 feet;
thence South 89°57'56" West, 2.70 feet;
thence South 00°02'04" East, 7.37 feet;
thence North 89°57'56" East, 14.76 feet;
thence South 00°25'32" East, 36.95 feet;
thence North 89°57'56" East, 4.50 feet;
thence South 00°02'04" East, 7.37 feet;
thence South 89°57'56" West, 12.33 feet;
thence North 00°02'04" West, 7.68 feet;
thence South 89°57'56" West, 44.20 feet;
thence South 00°02'04" East, 91.26 feet;
thence North 89°57'56" East, 30.67 feet;
thence North 00°02'04" West, 15.30 feet;
thence North 89°57'56" East, 75.28 feet;
thence South 00°03'00" West, 45.78 feet;

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PM	GW										
DRN	MF CK GW										
05033L											
SH 1 of 2											
<p>THESE DOCUMENTS ARE PREPARED IN ACCORDANCE WITH THE TERMS AND CONDITIONS OF THE CONTRACT FOR THIS PROJECT</p>											

Parcel "B"

thence South 89°38'23" West, 50.48 feet;
 thence South 00°02'04" East, 8.70 feet;
 thence South 89°57'56" West, 55.90 feet;
 thence South 00°02'04" East, 61.13 feet;
 thence North 89°47'56" West, 44.86 feet;
 thence South 00°02'04" East, 19.30 feet;
 thence South 89°57'56" West, 18.00 feet;
 thence North 00°02'04" West, 6.50 feet;
 thence South 89°57'56" West, 22.08 feet;
 thence North 00°02'04" West, 12.60 feet;
 thence South 89°57'56" West, 35.77 feet;
 thence North 00°02'04" West, 1.80 feet;
 thence South 89°57'56" West, 6.07 feet;
 thence South 00°02'04" East, 43.24 feet;
 thence South 89°26'21" West, 21.56 feet;
 thence North 00°02'04" West, 7.87 feet;
 thence South 89°57'56" West, 42.57 feet;
 thence North 00°02'04" West, 73.00 feet;
 thence North 89°57'56" East, 2.46 feet;
 thence North 00°02'04" West, 10.70 feet;
 thence South 89°57'56" West, 0.56 feet;
 thence North 00°02'04" West, 0.31 feet;
 thence North 57°51'57" West, 12.77 feet;
 thence South 89°57'56" West, 0.60 feet;
 thence North 00°02'04" West, 4.03 feet;
 thence South 89°57'56" West, 61.24 feet;
 thence South 00°02'04" East, 25.97 feet;
 thence South 89°53'07" West, 39.86 feet;
 thence North 00°14'17" East, 26.39 feet;
 thence South 89°57'56" West, 124.68 feet;
 thence South 00°02'04" East, 8.18 feet;
 thence South 89°57'56" West, 14.05 feet;
 thence North 00°02'04" West, 8.17 feet;
 thence South 89°57'56" West, 10.00 feet;
 thence South 00°02'04" East, 33.66 feet;
 thence South 89°56'22" West, 99.69 feet;
 thence South 00°02'04" East, 68.14 feet;
 thence South 89°57'56" West, 60.75 feet;
 to the Point of Beginning.

Said Parcel contains 2.97 acres.


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THESE DOCUMENTS ARE PREPARED IN ACCORDANCE WITH THE TERMS AND CONDITIONS OF THE CONTRACT FOR THIS PROJECT.			

Parcel "C"

PARCEL "C" (South Parking Area Driveway)

Part of the Southeast 1/4 of Section 7, Town 27 North, Range 10 West, City of Traverse City, Grand Traverse County, Michigan, more fully described as follows;

Commencing at the South 1/4 corner of said Section 7;
thence North 00°22'13" West, 264.10 feet,
along the North and South 1/4 line of said Section 7;
thence North 89°37'47" East, 214.15 feet,
along a line perpendicular to the said North and South 1/4 line, and to the Point of Beginning;
thence North 26°53'08" East, 38.10 feet;
thence easterly, 51.61 feet, along the arc of a 87.69 foot radius curve to the left, the central angle of is 33°43'28", and the long chord of which bears
North 71°01'27" East, 50.87 feet;
thence North 53°32'30" East, 127.48 feet;
thence North 88°23'44" East, 15.13 feet;
thence northeasterly, 16.36 feet, along the arc of a 9.05 foot radius curve to the left, the central angle of is 103°35'50", and the long chord of which bears
North 39°05'21" East, 14.22 feet;
thence North 89°47'43" West, 13.49 feet;
thence North 01°32'13" West, 23.32 feet;
thence North 89°57'56" East, 14.05 feet;
thence North 00°02'04" West, 8.18 feet;
thence North 89°57'56" East, 124.68 feet;
thence South 00°14'17" West, 26.39 feet;
thence North 89°53'07" East, 39.86 feet;
thence South 17°20'32" East, 17.75 feet;
thence South 27°15'21" West, 20.53 feet;
thence southerly, 4.30 feet, along the arc of a 2.67 foot radius curve to the left, the central angle of is 92°16'48", and the long chord of which bears
South 20°10'06" East, 3.85 feet;
thence South 58°47'03" East, 100.82 feet;
thence South 31°09'23" West, 26.75 feet;
thence North 62°00'32" West, 7.64 feet;
thence South 72°30'34" West, 22.83 feet;
thence North 56°07'17" West, 29.96 feet;
thence North 19°44'43" East, 6.45 feet;
thence northerly, 14.37 feet, along the arc of a 12.90 foot radius curve to the left, the central angle of is 63°49'00", and the long chord of which bears
North 16°23'35" West, 13.64 feet;
thence North 57°55'36" West, 42.07 feet;
thence North 66°50'02" West, 46.04 feet;
thence South 89°56'07" West, 103.88 feet;
thence South 71°17'54" West, 28.02 feet;
thence South 57°52'32" West, 97.89 feet;
thence South 34°49'42" West, 23.74 feet;
thence South 30°10'40" West, 23.47 feet;
thence South 19°35'46" West, 25.28 feet;
thence South 14°12'03" West, 15.37 feet;
thence westerly, 10.63 feet, along the arc of a 7.07 foot radius curve to the left, the central angle of is 86°07'52", and the long chord of which bears
South 68°08'38" West, 9.66 feet;
thence South 15°17'39" West, 6.63 feet;
thence North 55°45'50" West, 32.99 feet;
thence North 41°27'14" East, 11.78 feet;
thence North 21°25'50" East, 8.21 feet;
thence North 49°48'55" West, 19.33 feet;
to the Point of Beginning.

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Parcel "C"

Said Parcel contains 0.49 acres.

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Parcel "D"

PARCEL "D" (South Parking Area)

Part of the Southeast 1/4 of Section 7, Town 27 North, Range 10 West,
City of Traverse City, Grand Traverse County, Michigan, more fully described as
follows;

Commencing at the South 1/4 corner of said Section 7;
thence North 00°22'13" West, 124.96 feet,
along the North and South 1/4 line of said Section 7;
thence North 89°37'47" East, 348.96 feet;
along a line perpendicular to the said North and South 1/4 line, and to the
Point of Beginning;
thence North 28°17'48" West, 73.41 feet;
thence North 55°12'44" West, 55.22 feet;
thence North 71°18'19" West, 14.37 feet;
thence North 14°12'03" East, 15.37 feet;
thence North 19°35'46" East, 25.28 feet;
thence North 30°10'40" East, 23.47 feet;
thence North 34°49'42" East, 23.74 feet;
thence North 57°52'32" East, 60.16 feet;
thence South 10°00'05" East, 7.88 feet;
thence South 37°38'12" East, 41.55 feet;
thence North 00°27'49" East, 19.77 feet;
thence North 89°53'53" East, 203.51 feet;
thence South 02°33'45" East, 18.79 feet;
thence North 50°35'11" East, 13.94 feet;
thence South 56°07'17" East, 29.96 feet;
thence South 53°42'44" West, 10.55 feet;
thence South 01°53'38" East, 144.63 feet;
thence South 89°29'58" West, 237.09 feet;
thence South 61°44'47" West, 23.72 feet;
to the Point of Beginning.

Said Parcel contains 1.28 acres.

PH 231.946.5874 FAX 231.946.3703 www.gourdiefraser.com 123 W. Front Street Traverse City, MI 49684	 Gourdie-Fraser Municipal Development Transportation	Location: TBA/PGS PROJECT SECTION 7, T27N, R10W EAST BAY TWP, GRAND TRAVERSE CO, MI	DATE: 07-31-08 PM GW DRN MF CX GW 05033L SH 1 of 1
THESE DOCUMENTS ARE PREPARED IN ACCORDANCE WITH THE TERMS AND CONDITIONS OF THE CONTRACT FOR THIS PROJECT.			

Parcel "E"

PARCEL "E" (South Driveway and Parking Area)

Part of the Southeast 1/4 of Section 7, Town 27 North, Range 10 West, City of Traverse City, Grand Traverse County, Michigan, more fully described as follows;

Commencing at the South 1/4 corner of said Section 7;
thence North 00°22'13" West, 124.96 feet,
along the North and South 1/4 line of said Section 7;
thence North 89°37'47" East, 348.96 feet;
along a line perpendicular to the said North and South 1/4 line, and to the Point of Beginning;
thence North 61°44'47" East, 16.67 feet;
thence South 34°42'26" East, 24.48 feet;
thence southeasterly, 140.58 feet, along the arc of a 148.89 foot radius curve to the left, the central angle of is 54°05'56", and the long chord of which bears
South 63°14'44" East, 135.42 feet;
thence North 89°26'24" East, 24.01 feet;
thence North 00°16'11" West, 57.38 feet;
thence North 89°29'31" East, 181.42 feet;
thence South 09°33'10" East, 1.14 feet;
thence North 87°31'24" East, 59.69 feet;
thence North 88°54'08" East, 24.41 feet;
thence northeasterly, 10.23 feet, along the arc of a 10.22 foot radius curve to the left, the central angle of is 57°21'38", and the long chord of which bears
North 44°32'43" East, 9.81 feet;
thence North 06°23'59" East, 7.27 feet;
thence North 70°10'32" East, 19.64 feet;
thence South 88°53'13" East, 35.30 feet;
thence South 87°02'18" East, 44.73 feet;
thence South 03°09'29" West, 34.67 feet;
thence South 88°42'23" West, 64.37 feet;
thence South 02°40'33" East, 22.28 feet;
thence South 87°59'44" West, 78.47 feet;
thence southerly, 8.77 feet, along the arc of a 7.56 foot radius curve to the left, the central angle of is 66°26'10", and the long chord of which bears
South 05°16'00" East, 8.28 feet;
thence southeasterly, 12.09 feet, along the arc of a 21.25 foot radius curve to the left, the central angle of is 32°35'07", and the long chord of which bears
South 61°56'23" East, 11.92 feet;
thence North 89°05'55" East, 147.14 feet;
thence South 00°25'25" West, 16.23 feet;
thence South 88°54'51" West, 386.13 feet;
thence North 87°21'38" West, 42.69 feet;
thence northwesterly, 148.75 feet, along the arc of a 161.57 foot radius curve to the right, the central angle of is 52°45'05", and the long chord of which bears
North 58°27'58" West, 143.56 feet;
thence North 33°01'30" West, 15.84 feet;
to the Point of Beginning.

Said Parcel contains 0.67 acres.

<p>PH 231.946.5874 FAX 231.946.3703 WWW.gourdiefrazer.com 123 W. Front Street Traverse City, MI 49684</p>	<p>gfa Gourdie-Fraser Municipal Development Transportation</p>	<p>Location: TBA/PGS PROJECT SECTION 7, T27N, R10W EAST BAY TWP, GRAND TRAVERSE CO, MI</p>	DATE: 07-31-08-
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Parcel "F"

PARCEL "G" (Northeast Circular Pad)

A 28.14 foot radius circle in part of the Southeast 1/4 of Section 7, Town 27 North, Range 10 West,
City of Traverse City, Grand Traverse County, Michigan, the center point of which
is more fully described follows;

Commencing at the South 1/4 corner of said Section 7;
thence North 00°22'13" West, 425.89 feet,
along the North and South 1/4 line of said Section 7;
thence North 89°37'47" East, 1133.31 feet;
along a line perpendicular to the said North and South 1/4 line,
to the center of a said 28.14 foot radius circle.

said parcel contains 2847.06 square feet.

<p>PH 231.946.5874 FAX 231.946.3703 www.gourdiefraser.com 123 W. Front Street Traverse City, MI 49684</p>	<p>gfa Gourdie-Fraser Municipal Development Transportation</p>	<p>Location:</p> <p>TBA/PGS PROJECT SECTION 7, T27N, R10W EAST BAY TWP, GRAND TRAVERSE CO, MI</p>	<table border="1"><tr><td colspan="4">DATE: 07-31-08</td></tr><tr><td colspan="2">PM.</td><td colspan="2">GW</td></tr><tr><td>DRN</td><td>MF</td><td>CK</td><td>GW</td></tr><tr><td colspan="4">05033L</td></tr><tr><td colspan="4">SH 1 of 1</td></tr></table>	DATE: 07-31-08				PM.		GW		DRN	MF	CK	GW	05033L				SH 1 of 1			
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<p>THESE DOCUMENTS ARE PREPARED IN ACCORDANCE WITH THE TERMS AND CONDITIONS OF THE CONTRACT FOR THIS PROJECT.</p>																							

EXHIBIT 4

CONSENT OF EASEMENT HOLDERS

As evidenced below by my signature, I agree and consent to the recording of the land use and resource use restrictions specified in this Restrictive Covenant and hereby agree that my property interest shall be subject to and subordinate to the terms of the Restrictive Covenant.

City of Traverse City

By: 
Signature

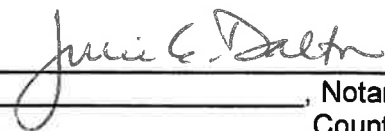
Name: Makayla Vitous
Print or Type Name

Its: Assistant City Manager as Acting City Manager
Title

STATE OF MICHIGAN)
COUNTY OF GRAND TRAVERSE)

On this 31st day of July, 2012, before me personally appeared Makayla Vitous, to me sworn to be the person described in and who executed the foregoing instrument and acknowledged that she executed the same, as her free act and deed, in the capacity above described.

Julie E. Dalton
Notary Public - Leelanau County MI
Acting in Grand Traverse County
My commission expires: 11/6/2016


_____, Notary Public
_____, County, Michigan
Acting in _____ County, Michigan
My Commission Expires: _____

Appendix B

Construction Activities Checklist and Environmental Information Sheet

Construction Activities Checklist

Traverse Bay Area Career Technical Center
880 Parsons Road
Traverse City, Michigan 49686

If any construction activities that will disturb the ground below the existing grade level are planned, complete the following checklist. The following actions must be performed before any construction activities that will result in digging on the TBA Property occur:

Activity	Date Completed	Name/Affiliation
Provide Contractor with Environmental Information Sheet.		
Provide Contractor access to Due Care Plan and RAP (upon request).		
Review Contractor Health and Safety plan for the specific activity.		
Establish an on-site stockpile area for excavated soil. See Soil Management Flowchart and/or Soil Management Plan for additional information.		
All soil returned to excavation. Return all soil to excavation if possible.		
If soil not returned to excavation, perform testing to determine suitable soil relocation/disposal, and complete the next five rows.		
<ul style="list-style-type: none"> ○ Contact TBAISD environmental consultant and develop proposed soil relocation/disposal plan. 		
<ul style="list-style-type: none"> ○ Obtain MDEQ approval of proposed soil relocation/disposal plan. 		
<ul style="list-style-type: none"> ○ Relocate clean soil within the site. 		
<ul style="list-style-type: none"> ○ Dispose of contaminated soil not returned directly to the excavation. 		
<ul style="list-style-type: none"> ○ Retain the name of the disposal location, the date of disposal, and proof of disposal (manifest, load ticket and invoice, etc.). 		
Replace any disturbed infiltration/exposure barrier to current conditions, i.e., meeting appropriate Michigan asphalt ratings for parking areas, within 14 days of completion of the work.		
Keep dewatering water in closed containers.		
Dispose of dewatering water as liquid industrial waste using non-hazardous waste profile. (Disposal to sanitary sewer acceptable only if a temporary permit is obtained.)		

The original copy of this form, along with the documentation listed above, will be kept at the TBA CTC maintenance office.

Environmental Information Sheet for Contractors and Utilities Performing Subsurface Work

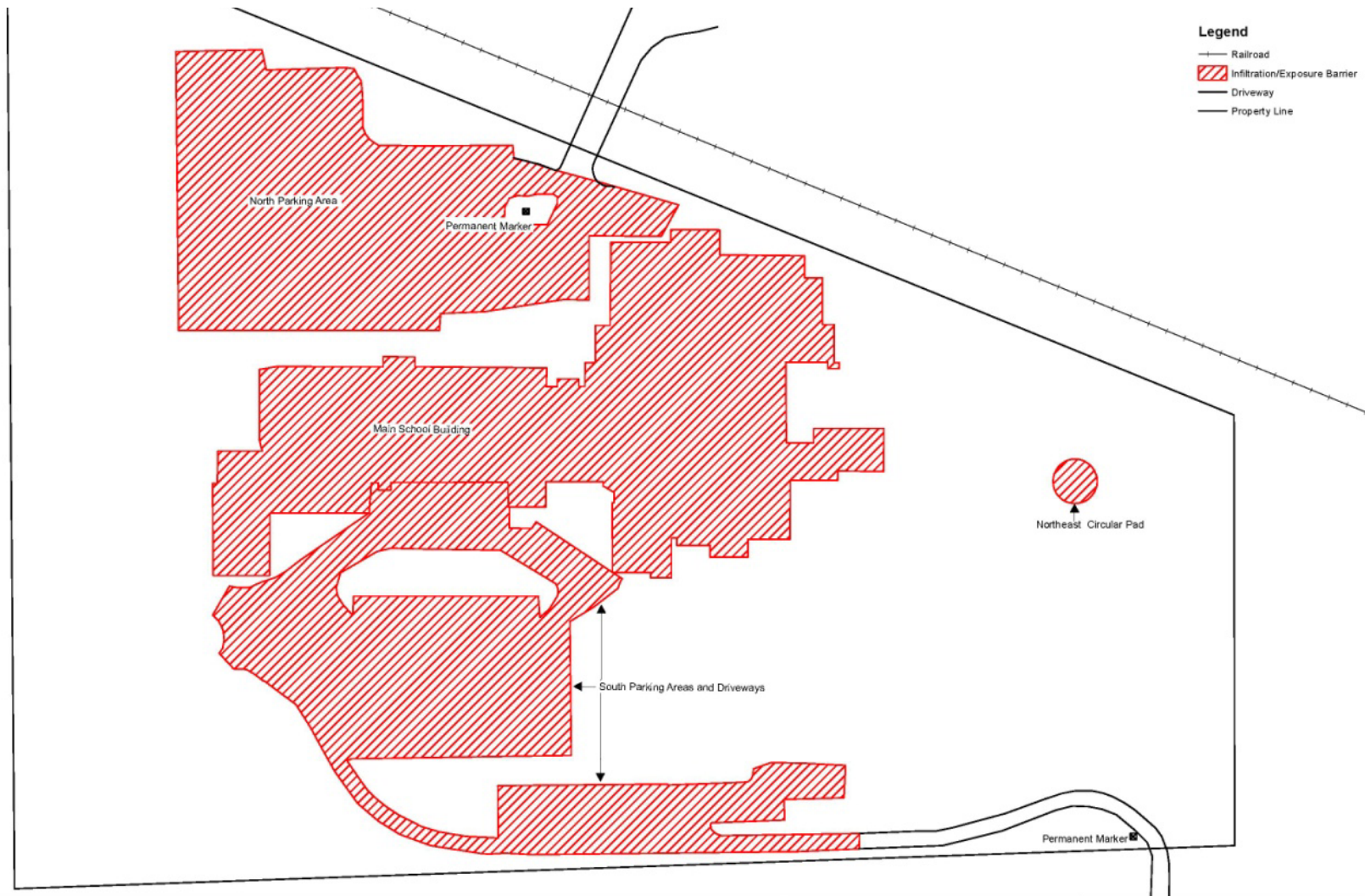
Traverse Bay Area Career Technical Center
880 Parsons Road
Traverse City, Michigan 49686

The TBA Career Tech Center property meets the definition of “facility” as defined in Part 201 of Michigan’s Natural Resources Environmental Protection Act, PA 451 of 1994, as amended, meaning that it has certain areas of contamination that exceed Michigan’s generic residential cleanup criteria. In-situ air sparging remediation activities are being performed in certain areas on the property. A Remedial Action Plan (RAP) has been approved by the Michigan Department of Environmental Quality for the site, which outlines the actions that are being taken to address these areas of contamination. A Restrictive Covenant is in place on the property.

The following information summarizes site conditions, which may potentially affect subsurface work (e.g., excavation or below-grade activities) at the TBA Career Tech Center property:

1. Groundwater wells are prohibited on the property. The exceptions to this prohibition are 1) the construction of wells needed to implement the RAP, or 2) the temporary construction of wells for dewatering excavations.
2. Excavation or intrusive activities are prohibited in certain areas of the property where infiltration/exposure barriers are maintained (i.e., designated large pavement areas and the existing main TBA building footprint – see Figure 1 attached). Temporary removal of the pavement and excavation of soils is allowed, provided the pavement is restored within 14 days of completion of the work.
3. Activities which could interfere with the implementation of remediation activities are prohibited. Planned subsurface activities must be reviewed and approved by TBAISD prior to start of any subsurface work on the property.
4. The TBA Career Tech Center must properly manage any soils, media (e.g., groundwater), and/or debris generated during excavation activities on the property. If soil, media or debris generated during excavation activities are considered “contaminated” by sources on the TBA property to the extent they could not be returned to the excavation, then they will be managed by TBAISD and AK Steel. During excavations, soils will be managed according to a Soil Management Plan (see attached soil management flowchart). Dewatering water will be managed as a liquid industrial waste.

Figure 1 – Infiltration/Exposure Barriers



TBA Career Tech Center Soil Management Flowchart

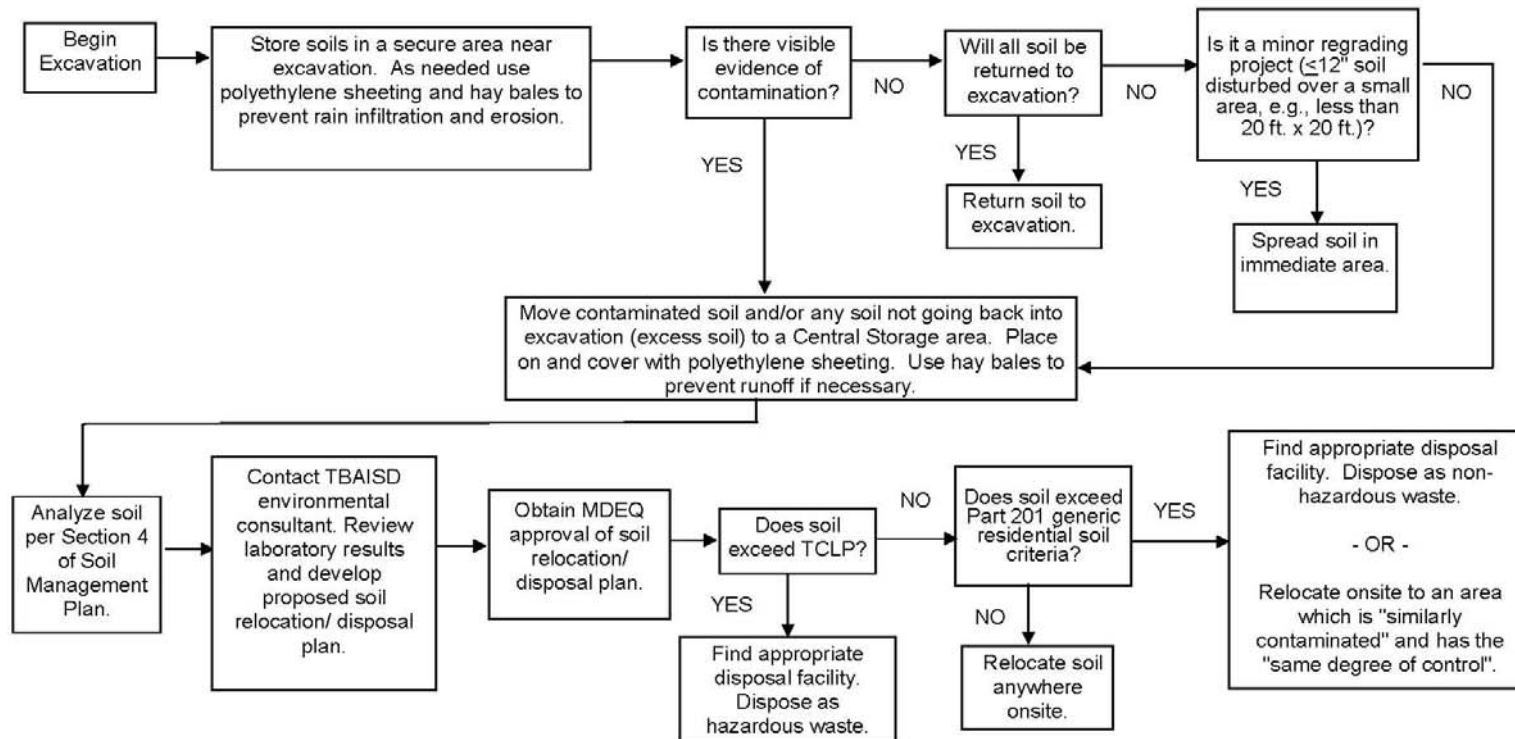


Figure 4-2 from Due Care Plan

Appendix C

Soil Management Plan

Prepared for:
TBAISD and AK Steel
Traverse City, MI

Soil Management Plan for the TBA Career Technical Center

AECOM, Inc.
January 2014
Document No.: 60287589.REG1

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Table 2 RCRA TCLP Criterion and Michigan Soil Criterion for Metals

1.0 Introduction

This Soil Management Plan (SMP) was prepared for the property currently owned and operated by the Traverse Bay Area Intermediate School District (TBAISD), which encompasses the Career Technical Center (CTC), and is herein after referred to as the TBA property.

This plan is intended to address excavated soil generated during periodic repair of existing subgrade features (for example, storm drains and gas mains) or shallow trench excavations for the installation of new piping runs, electric lines, or similar utilities, or other similar work. In most cases it will be appropriate to return all soil removed for any repairs or construction back to the excavation. Excess soil remaining upon project completion, however, must be handled as described in this soil management plan.

This soil management plan focuses only on the requirements for handling property soil, and does not address other worker safety requirements. A Health and Safety Plan must be prepared and implemented as required, to address applicable regulatory requirements (for example, shoring of excavations).

1.1 Background

The TBA property is a part of the Pine Grove Subdivision Facility, where remedial actions are being conducted to address concentrations of volatile organic compounds (VOCs) and inorganics found in environmental media that were identified in historical and recent investigations as being above applicable Michigan Department of Environmental Quality (MDEQ) land use based cleanup criteria.

1.2 Scope of Soil Management Plan

This plan has been prepared to offer guidance to personnel who may generate spoils from routine maintenance or construction work at the TBA property. TBA CTC must manage all soils, media and/or debris located on the property in accordance with the applicable requirements of Section 20120c of the NREPA; Part 111, Hazardous Waste Management, of the NREPA; Subtitle C of the Resource Conservation and Recovery Act, 42 U.S.C. Section 6901 et seq.; the administrative rules promulgated thereunder; and all other relevant state and federal laws.

To date, low concentrations of constituents have been detected in soil on the TBA Property, at levels well below MDEQ Part 201 standards for the protection of workers performing onsite construction. Therefore, limited construction activities are allowed, with the goal of returning stockpiled soil to the excavation.

Most excavation activities on the property will be minor in nature. Minor regrading projects which disturb soil to a depth of 12 inches or less over a small area (e.g. 20 ft x 20 ft) and which reveal no visual signs of contamination will not trigger the requirements of this Soil Management Plan, as long as the material is distributed in the immediate area. Because these “minor” projects will not significantly “relocate” the soil, no specific management practices are necessary.

1.3 Infiltration/Exposure Barriers

As a presumptive remedy to address undelineated potential sources beneath the main building and large paved areas on the TBA Property, TBAISD is required to maintain structures on the TBA Property as barriers to infiltration and exposure. The Career Technical Center main school building

and several other large paved areas on the property will be maintained as barriers to infiltration and exposure at the site (refer to Figure 4-1 of the Due Care Plan for the location of these barriers).

Soils from beneath the infiltration/exposure barriers may be restricted in where they can be reused, depending on analytical results.

1.4 Points of Contact

Any work requiring soil excavation with hand tools or heavy equipment, or work requiring the removal of pavement to expose the soil surface must be cleared with the CTC Maintenance Supervisor.

2.0 Excavation and Segregation

The goal of excavation and segregation activities will be to return stockpiled soil back into the excavation or be relocated as close as possible to the point of origin. Details of the excavation and segregation criteria are described below.

2.1 Backfilling

If new utilities are installed with the use of imported fill, excess soil from the upper 12 inches (assuming there are no signs of contamination) can be spread out at the land surface near the excavation, and covered with gravel (or loam and seeded). For paved areas, excess soil cannot be spread out at the land surface, and must be moved to the central storage area (refer to Section 3.4).

2.2 Restoration of Land Surface

If paving was removed to perform the excavation, it must be replaced to its original condition and grade upon completion of the project. If the disturbed paving is part of the infiltration/exposure barriers (see Figure 4-1 of the Due Care Plan), it must be replaced within 14 days of completion of the work. If gravel or topsoil was removed to access the underlying soil, it must be replaced over the area of excavation to a thickness of 3 to 6 inches.

3.0 Storage and Stockpiling

Storage and stockpiling requirements are described in this section. Stockpiling should be conducted in a manner to prevent rain infiltration, erosion, and dust generation. Stockpiled soil should not be positioned so that it is readily accessible to the general public.

3.1 General Requirements

Excavated soil should be handled and stored as follows.

- Soils should be stored in a secure manner to prevent access to site visitors and exposure to the environment, immediately adjacent to the excavation where possible.
- As needed, soil will be covered to minimize infiltration of precipitation, to limit dust, and/or to prevent erosion of the stockpile. Cover material should be properly secured and possess the

necessary physical strength to resist tearing by the wind. Failure of materials used to cover soil should be repaired, replaced, or re-secured.

3.2 Temporary Storage

During excavation, soil should be placed next to the excavation. For most repairs it is expected that the soil will be returned to the excavation the same day, or within a few days.

3.3 Interim Storage

Interim storage procedures should be used when excavated soil is held outside of the excavation for an extended period of time (for example, over a weekend). Interim storage may be located adjacent to the trench or at a location near the trench (e.g., if soil is moved away from the trench where it crosses a road). Stockpiled soil should be covered with polyethylene sheeting, with hay bales positioned as needed to prevent runoff.

3.4 Central Storage

Central storage is only required for excess soil that cannot be returned to the excavation or spread out at the land surface adjacent to the excavation in areas. The central storage area should be paved. Stockpiled soil should be placed on, and covered with, polyethylene sheeting. Hay bales should be positioned to prevent runoff. Material moved to central storage must be characterized for either offsite disposal or onsite reuse.

4.0 Sampling and Analysis of Excavated Soils (if necessary)

Soil which is returned directly to the point of excavation will not require sampling and analysis. Any soil showing visible signs of contamination must be tested. Further, all excess soil which is moved from the immediate area must be tested. Excess soil that is visibly clean (that is, contains no staining, odor, or other indication of contamination) may be appropriate for reuse elsewhere onsite. To make that determination, sampling of soils in the Central Storage shall occur for the following analyses:

- SW-846 Toxicity Characteristic Leachate Procedure (TCLP), USEPA Method 1311, for metals, only,
- RCRA 8 Metals (USEPA Method 6010B), and
- TBA-specific "Project" Volatiles (cis-1,2-Dichloroethene, trans-1,2-Dichloroethene, 1,1-Dichloroethene, tetrachloroethene, trichloroethene, and vinyl chloride) via SW846 8260B.

Tables 1 and 2 show applicable criteria for comparison of soil analytical results.

Table 1 – Michigan Part 201 Soil Criteria for TBA-specific Volatiles

Volatile	Groundwater Protection Soil Criterion	Direct Exposure Soil Criterion (Lowest
----------	---------------------------------------	---

	(Lowest Applicable) (mg/kg)		Applicable (mg/kg)	
cis-1,2-Dichloroethene	1.4	DWPC	22	SVIIC
trans-1,2-Dichloroethene	2.0	DWPC	23	SVIIC
1,1-Dichloroethene	0.14	DWPC	0.062	SVIIC
Tetrachloroethene	0.1	DWPC	11	SVIIC
Trichloroethene	0.1	DWPC	1	SVIIC
Vinyl chloride	0.04	DWPC	0.27	SVIIC

DWPC – Drinking Water Protection Criteria

SVIIC – Soil Volatilization to Indoor Air Inhalation Criteria

Table 2 – RCRA TCLP Criteria and Michigan Part 201 Criteria for Metals in Soil

Metal	RCRA Hazardous Waste TCLP Criteria (mg/L)	Michigan Soil Background Standard ¹ (mg/kg)	Groundwater Protection Soil Criterion (Lowest Applicable) (mg/kg)		Direct Exposure Soil Criterion (Lowest Applicable) (mg/kg)	
Arsenic	5	5.8	4.6	DWPC	7.6	DCC
Barium	100	75	380	GSIPC	37,000	DCC
Cadmium	1	1.2	3.0	GSIPC	550	DCC
Chromium	5	18.0	1,000,000 (Cr+3)	DWPC	250,000 (Cr+3)	PSIC
			3.3 (Cr+6)	GSIPC	200,000 (Cr+6)	PSIC
Lead	5	21.0	700	DWPC	400	DCC
Mercury	0.2	0.13	0.050 ²	GSIPC	40	VSIC
Selenium	1	0.41	0.41	GSIPC	2,600	DCC
Silver	5	1.0	1.0	GSIPC	2,500	DCC

DCC – Direct Contact Criteria

DWPC – Drinking Water Protection Criteria

GSIPC – Groundwater Surface Water Interface Protection Criteria

PSIC – Particulate Soil Inhalation Criteria
 VSIC – Volatile Soil Inhalation Criteria
 RCRA – Resource Conservation and Recovery Act
 TCLP - Toxicity Characteristic Leaching Procedure

Notes:

¹Background standards are for reference only. Part 201 does not require soil to meet background standards.

²Per footnote M of the Part 201 criteria tables, the GSIPC is below the analytical target detection limit, thus the criterion defaults to the target detection limit of 0.050 mg/kg

If sample results show compliance with TCLP criteria (40 CFR 261.24 Table 1), and no exceedances of Michigan Part 201 soil criteria (Section 20120a of the NREPA, R299.5746), then the soil is suitable for onsite reuse in any location on the property.

If sample results show compliance with TCLP criteria, but exceedances of one or more Michigan Part 201 criteria, then the soil can be relocated to another location within the TBA CTC property which is “similarly contaminated and similarly controlled” or the soil can be disposed offsite as non-hazardous material.

If sample results show an exceedance of any TCLP criteria, the soil should be disposed offsite as a RCRA hazardous waste. Note: hazardous wastes have special storage requirements prior to disposal. In this situation, the environmental consultant should be contacted immediately for guidance.

See sections below for further explanation of onsite reuse and disposal options.

5.0 Relocation of Soil

5.1 Onsite Reuse

If determined appropriate for reuse, the excess soil can be relocated to other areas of the site, only after approval from MDEQ (see Section 6.0 below). At the chosen location, excess soil can be spread out and graded taking care not to significantly alter site topography and potential drainage patterns. Once spread out, the excess soil must be covered with crushed rock, top soil, pavement, grass seed or shrubs.

There are a number of considerations which must be made to determine the appropriate relocation for the soil. According to Michigan Part 201 regulations (Section 20120c of the NREPA), the following three stipulations apply to soil relocation within this site:

1. *Soil can only be relocated onsite to a location that is “similarly contaminated, considering the general nature, concentration and mobility of hazardous substances present” as the original location.*

If soil analyses show compliance with applicable criteria, the soil can be relocated anywhere on the property. If soil analyses show exceedances of any criteria in Tables 1 or 2 above, the soil can only be relocated to an area onsite which is similarly contaminated. Relocating to an area which is similarly contaminated will require soil data analysis (utilizing existing or new data for the desired

new location) to ensure soil conditions are similar. Please contact the environmental consultant for further analysis.

2. *Soil that is relocated within a site of environmental contamination where a RAP has been approved can only be relocated to a location with the “same degree of control required for application of the criteria”.*

Any location within the TBA CTC property would be considered to have a similar “basic” degree of control. However, the infiltration/exposure barriers at the site (see Figure 4-1 of the Due Care Plan) are assumed to provide a different degree of control from areas of the property not under an infiltration/exposure barrier. Therefore, the relocation of soils from under the infiltration/exposure barriers (if analysis shows exceedance of criteria) will be restricted to other locations beneath the barriers. As this is considered impractical, soils removed from beneath an infiltration/exposure barrier which cannot be returned to the point of origin will most likely require offsite disposal if analysis shows exceedance of soil criteria. See Section 5.2 below. Excess soils from beneath an infiltration/exposure barrier which are considered “clean” based on analytical testing (i.e. do not exceed any parameter in Tables 1 or 2 above) may be relocated to any area of the property, only after approval from MDEQ.

3. *Soil that is relocated onsite at a Facility where a RAP has been approved based on a categorical cleanup criterion shall not be moved without prior MDEQ approval.*

The TBA property is part of a Facility where a RAP has been approved. As noted above and described in Section 6.0, MDEQ approval is required prior to soil relocation.

5.2 Offsite Disposal

Excess soil that cannot be reused onsite requires offsite disposal, with prior approval from MDEQ. Offsite disposal of excess soil is required for soils exceeding TCLP criteria (hazardous waste disposal). Offsite disposal of excess soils not meeting Michigan Part 201 criteria may be required if a suitable area of relocation cannot be found (non-hazardous waste disposal). Soils destined for disposal must be physically and chemically characterized in accordance with state and federal regulations, and the requirements of the receiving facility. Under no circumstance should any soil leave the TBA property unless it is destined for the appropriate receiving facility for treatment and/or disposal. Transport of soil from the site must be conducted by licensed transporters to a pre-approved and properly permitted receiving facility.

There are a number of considerations which must be made to determine the appropriate offsite disposal for the soil. According to Michigan Part 201 regulations (Section 20120c of the NREPA), the following three stipulations apply to offsite soil relocation:

1. *Soil can only be moved and relocated offsite if it is determined that it will be lawfully relocated without posing a threat to public health, safety or welfare or the environment. Soil potentially poses such threat if hazardous substances in the soil exceed Part 201 cleanup criteria. If soil is moved offsite for treatment or disposal, the soil must meet the regulatory criteria for that treatment or disposal.*

Soil can only be sent to an offsite disposal location if the soil meets the requirements for acceptance at that disposal facility. The soil analytical results would be compared to the acceptance criteria for the disposal facility. If the TCLP criteria are not exceeded, the soil would not be classified as hazardous waste.

2. *Contaminated soil can only be moved offsite if it is taken to an offsite location for treatment or disposal in conformance with applicable laws and regulations.*

The soil can only be sent to an offsite disposal location if the disposal facility can legally accept the soil and has appropriate permits/licenses. Offsite transportation must also be done using transporters with appropriate licenses/approvals.

3. *Soil that is moved offsite from a Facility where a RAP has been approved based on a categorical cleanup criterion shall not be moved without prior MDEQ approval.*

The TBA property is part of a Facility where a RAP has been approved. As noted above and described in Section 6.0, MDEQ approval will be required prior to soil disposal.

6.0 MDEQ Approval

If soil is being moved offsite from, moved to, or relocated onsite at a facility where a remedial action plan has been approved by the department (i.e., MDEQ) based on a categorical cleanup criterion in section 20120a(1)(c) or (d) or (2), the soil shall not be moved without prior department approval. Since the Limited Residential category (20120a(1)(c)) applies to the TBA CTC property, MDEQ approval will be needed before the soil is relocated onsite or is sent for offsite disposal.

The request for MDEQ approval to relocate or dispose of soil from the TBA CTC property should include the following information:

- (a) The location from which soil has been or will be removed.
- (b) The location to which the soil will be taken.
- (c) The volume of soil to be moved.
- (d) A summary of information or data on which the owner is basing the determination that the soil does not present a threat to the public health, safety, or welfare, or the environment (e.g., the soil meets applicable criteria) or that the soil will be moved to a location onsite with similar contamination or that the soil will be properly disposed offsite.
- (e) If land use restrictions would apply to the soil when it is relocated, the notice shall include documentation that those restrictions are in place.

Appendix D

Dewatering Water Waste Profile

NON-HAZARDOUS WASTE PROFILE FORM

PLEASE FILL OUT FORM AS COMPLETELY AS POSSIBLE.

Generator Name: TBA Career Tech Center US EPA ID: MID981803471

Address: 880 Parsons Road

City: Traverse City State: MI Zip Code: 49686

Technical Contact: Charlie Gordon Email: _____

Phone: 231-922-6318 Fax: 231-922-6364

Remit to Address: _____
(if different)

Billing Name(if different): _____

Address: _____

City: _____ State: _____ Zip Code: _____

Contact: _____

Phone: _____ Fax: _____ Email: _____

Waste Material: Dewatering water

Process Generating: Excavations encountering groundwater

Is a representative sample included(Y/N): N

Is a MSDS/Analytical included(Y/N): N

Physical State: ☐ Solid ☒ Liquid ☐ Sludge ☐ Other

pH: ☐ < 2 ☐ 2.1-4.9 ☐ 5-10 ☐ 10.1-12.4 ☐ > 12.5

Flash Point: ☐ < 140 ☐ 141-200 ☒ > 200

Odor: ☒ None ☐ Mild ☐ Strong Describe

Composition*:	Water	(≥95%)	Methane	ND-26 mg/L
	Sand/Silt	(≤5%)	Mercury	ND-0.000065 mg/L
	Acetic Acid	ND-520 mg/L	Nitrate	ND-29 mg/L
	Aluminum	ND-0.7 mg/L	Nitrite	ND-4.2 mg/L
	Barium	ND-12.5 mg/L	Phosphorus	ND-14.2 mg/L
	Chloride	ND-670 mg/L	Tetrachloroethene	ND-0.2 mg/L
	Chromium	ND-0.13 mg/L	Trans-1,2-dichloroethene	ND-0.003 mg/L
	Cis-1,2-dichloroethene	ND-0.18 mg/L	Trichloroethene	ND-0.009 mg/L
	Iron	ND-11.8 mg/L	Vinyl Chloride	ND-0.01 mg/L
	Manganese	ND-2.5 mg/L		

*Based on max reported results in groundwater samples 2007-2009

Is this an EPA RCRA listed hazardous waste (F, K, P, or U)(Y/N):

Does this waste have oxidizing potential(Y/N):

Is this an EPA RCRA characteristic hazardous waste (D001-D043) (Y/N):

Do any State Waste Codes apply(Y/N):

Does the waste contain PCB's(Y/N):

Based On: ☒ General Knowledge ☒ Analysis ☐ MSDS

Do the following chemicals exceed the limits? (Y/N) Check here if no for all ☒

D004	Arsenic (5.0 ppm)	<input type="text"/>	D024	m-Cresol (200 ppm)	<input type="text"/>
D005	Barium (100 ppm)	<input type="text"/>	D025	p-Cresol (200 ppm)	<input type="text"/>
D006	Cadmium (1.0 ppm)	<input type="text"/>	D026	Cresols (200 ppm)	<input type="text"/>
D007	Chromium (5.0 ppm)	<input type="text"/>	D027	1,4 Dichlorobenzene (7.5 ppm)	<input type="text"/>
D008	Lead (5.0 ppm)	<input type="text"/>	D028	1,2 Dichloroethane (0.5 ppm)	<input type="text"/>
D009	Mercury (0.2 ppm)	<input type="text"/>	D029	1,1 Dichloroethylene (0.7 ppm)	<input type="text"/>
D010	Selenium (1.0 ppm)	<input type="text"/>	D030	2,2 Dinitrotoluene (0.13 ppm)	<input type="text"/>
D011	Silver (5.0 ppm)	<input type="text"/>	D031	Heptachlor (0.008 ppm)	<input type="text"/>
D012	Endrin (0.02ppm)	<input type="text"/>	D032	Hexachlorobenzene (0.13 ppm)	<input type="text"/>

D013	Lindane (0.4 ppm)	D033	Hexachlorobutadiene (0.5 ppm)
D014	Methoxychlor (10 ppm)	D034	Hexachloroethane (3.0 ppm)
D015	Toxaphene (0.5 ppm)	D035	Methyl Ethyl Ketone (200 ppm)
D016	2,4 D (10 ppm)	D036	Nitrobenzene (2 ppm)
D017	2,4,5 TP (1 ppm)	D037	Pentachlorophenol (100 ppm)
D018	Benzene (0.5 ppm)	D038	Pyridine (5 ppm)
D019	Car. Tetrachloride (.5 ppm)	D039	Tetrachloroethylene (0.7 ppm)
D020	Chlordane (0.03 ppm)	D040	Trichloroethylene (0.5 ppm)
D021	Chlorobenzene (100 ppm)	D041	2,4,5 Trichlorophenol (400 ppm)
D022	Chloroform (6.0 ppm)	D042	2,4,6 Trichlorophenol (2 ppm)
D023	o-Cresol (200 ppm)	D043	Vinyl Chloride (0.2 ppm)

Is this waste a Michigan non-hazardous liquid industrial waste(Y/N): <u>Y</u> Code <u>029L</u> Is this waste a used oil as defined by 40 CFR Part 279(Y/N): <u>N</u>
Waste Collection: <u>X</u> Drum _____ Cubic Yard Box _____ Tote - Gallon _____ Volume: <u>Variable</u> per <u>Event</u>
Additional Information: <u>Waste collection device could also be vacuum truck.</u>
<hr/> <p>On behalf of the generator I certify that all information contained in this non hazardous waste profile is complete and factual and is an accurate representation of the known and suspected hazards, and waste generator regulations, pertaining to the waste described herein; and I am an employee and duly authorized representative of the Generator.</p>

Signature: _____ Print: _____ Date: _____

Internal Use Only: _____ Profile Number: _____
 Reviewed By: _____ Approved: _____ Date: _____

Appendix E

Updated Notice to Utilities

On TBAISD letterhead

February XX, 2014

[Insert address]

Re: UPDATED NOTICE TO UTILITIES ON THE TBA CTC PROPERTY

Dear Sir or Madam:

This is a follow-up notice regarding site conditions at the Traverse Bay Area (TBA) Career Technical Center, 880 Parsons Road, Traverse City, MI. The original notice was provided to your company in November of 2009.

The TBA Career Tech Center Property is part of a "facility" as defined in Part 201 of Michigan's Natural Resources Environmental Protection Act, PA 451 of 1994, as amended, meaning that it has certain areas of contamination that exceed Michigan's generic residential cleanup criteria. Accordingly, subsurface activities on this property are potentially subject to a number of health, safety and environmental rules; these include but are not limited to: MI Part 201 as noted above; Section 20107a Due Care; and Worker Right to Know requirements. Workers operating in affected areas on the property, as well as anywhere groundwater could be contacted, must be trained according to OSHA protocol. It is your company's obligation to provide training, personal protective equipment and a health and safety plan prior to initiating subsurface site activity.

Under Michigan's Part 201, Natural Resources and Environmental Protection Act requirements, we are required to provide notice to easement holders and utilities if the hazardous substances present at the property may present an unacceptable exposure to utility workers or other persons conducting activities at the property. Groundwater beneath the TBA Property contains volatile organic compounds (e.g., tetrachloroethene) and other constituents in excess of drinking water standards. Therefore, it is unacceptable to drink the groundwater beneath the property.

The attached "Environmental Information Sheet" summarizes site conditions which affect subsurface work. Additional information can be found in the Due Care Plan for the TBA Property (updated January 2014), which is available for review at the TBA Career Tech Center. It is noted that methane monitoring is no longer required during excavations on the TBA Property.

If you have any questions regarding this notification, please contact me at the number below, or Elaine Nomina, project coordinator at our environmental consulting firm AECOM, 4219 Malsbary Road, Cincinnati, OH 45242; telephone: (513) 878-6853.

Sincerely,

Michael J. Hill
Superintendent

enclosure

Cc:

J. Vanderhoof, MDEQ

C. Levensgood, AK Steel

L. McAdams/E. Nomina, AECOM



Michael J. Hill, Superintendent
Carol Greilick, Assistant Superintendent for Special Education
Jason Jeffrey, Ed.D., Assistant Superintendent for General & Career and Technical Education

Traverse Bay Area Intermediate School District
1101 Red Drive, P.O. Box 6020, Traverse City, MI 49696-6020
231-922-6200 FAX: 231-922-6270
www.tbaisd.org

February 24, 2014

Mr. Tim Hoeffner
Office of Rail
Michigan Department of Transportation
Van Wagner Building
425 West Ottawa Street
Lansing, MI 48909

Re: UPDATED NOTICE TO UTILITIES ON THE TBA CTC PROPERTY

Dear Sir or Madam:

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Sincerely,

Michael J. Hill
Superintendent

Enc.

CC: J. Vanderhoof, MDEQ
C. Levengood, AK Steel
L. McAdams/E. Nomina, AECOM



Michael J. Hill, Superintendent
Carol Greilick, Assistant Superintendent for Special Education
Jason Jeffrey, Ed.D., Assistant Superintendent for General & Career and Technical Education

Traverse Bay Area Intermediate School District
1101 Red Drive, P.O. Box 6020, Traverse City, MI 49696-6020
231-922-6200 FAX: 231-922-6270
www.tbaisd.org

February 24, 2014

Mr. Jim Cook
Grand Traverse County Road Commission
1881 LaFranier Road
Traverse City, MI 49686

Re: UPDATED NOTICE TO UTILITIES ON THE TBA CTC PROPERTY

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Sincerely,

A handwritten signature in black ink that reads "Michael J. Hill".

Michael J. Hill
Superintendent

Enc.

CC: J. Vanderhoof, MDEQ
C. Levengood, AK Steel
L. McAdams/E. Nomina, AECOM



Michael J. Hill, Superintendent
Carol Greilick, Assistant Superintendent for Special Education
Jason Jeffrey, Ed.D., Assistant Superintendent for General & Career and Technical Education

Traverse Bay Area Intermediate School District
1101 Red Drive, P.O. Box 6020, Traverse City, MI 49696-6020
231-922-6200 FAX: 231-922-6270
www.tbaisd.org

February 24, 2014

Mr. Jered Ottenwess
City Manager
City of Traverse City
400 Boardman Avenue
Traverse City, MI 49684

Re: UPDATED NOTICE TO UTILITIES ON THE TBA CTC PROPERTY

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Sincerely,

A handwritten signature in black ink that reads "Michael J. Hill". The signature is written in a cursive, flowing style.

Michael J. Hill
Superintendent

Enc.

CC: J. Vanderhoof, MDEQ
C. Levengood, AK Steel
L. McAdams/E. Nomina, AECOM



Michael J. Hill, Superintendent
Carol Greilick, Assistant Superintendent for Special Education
Jason Jeffrey, Ed.D., Assistant Superintendent for General & Career and Technical Education

Traverse Bay Area Intermediate School District
1101 Red Drive, P.O. Box 6020, Traverse City, MI 49696-6020
231-922-6200 FAX: 231-922-6270
www.tbaisd.org

February 24, 2014

Mr. Tim Arends
Executive Director
Traverse City Light and Power
1131 Hastings Street
Traverse City, MI 49686

Re: UPDATED NOTICE TO UTILITIES ON THE TBA CTC PROPERTY

Dear Sir or Madam:

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Sincerely,

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Michael J. Hill
Superintendent

Enc.

CC: J. Vanderhoof, MDEQ
C. Levengood, AK Steel
L. McAdams/E. Nomina, AECOM



Michael J. Hill, Superintendent
Carol Greilick, Assistant Superintendent for Special Education
Jason Jeffrey, Ed.D., Assistant Superintendent for General & Career and Technical Education

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1101 Red Drive, P.O. Box 6020, Traverse City, MI 49696-6020
231-922-6200 FAX: 231-922-6270
www.tbaisd.org

February 24, 2014

AT&T
142 East State Street
Traverse City, MI 49684

Re: UPDATED NOTICE TO UTILITIES ON THE TBA CTC PROPERTY

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Michael J. Hill
Superintendent

Enc.

CC: J. Vanderhoof, MDEQ
C. Levengood, AK Steel
L. McAdams/E. Nomina, AECOM



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231-922-6200 FAX: 231-922-6270
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February 24, 2014

Ms. Betty White-Clark
DTE Energy
One Energy Plaza, 655 G.O.
Detroit, MI 48226

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Superintendent

Enc.

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C. Levengood, AK Steel
L. McAdams/E. Nomina, AECOM



Michael J. Hill, Superintendent
Carol Greilick, Assistant Superintendent for Special Education
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231-922-6200 FAX: 231-922-6270
www.tbaisd.org

February 24, 2014

Services Manager
Feyen Zylestra
2969 Keystone Road
Traverse City, MI 49686

Re: UPDATED NOTICE TO UTILITIES ON THE TBA CTC PROPERTY

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Michael J. Hill
Superintendent

Enc.

CC: J. Vanderhoof, MDEQ
C. Levengood, AK Steel
L. McAdams/E. Nomina, AECOM

Environmental Information Sheet for Contractors and Utilities Performing Subsurface Work

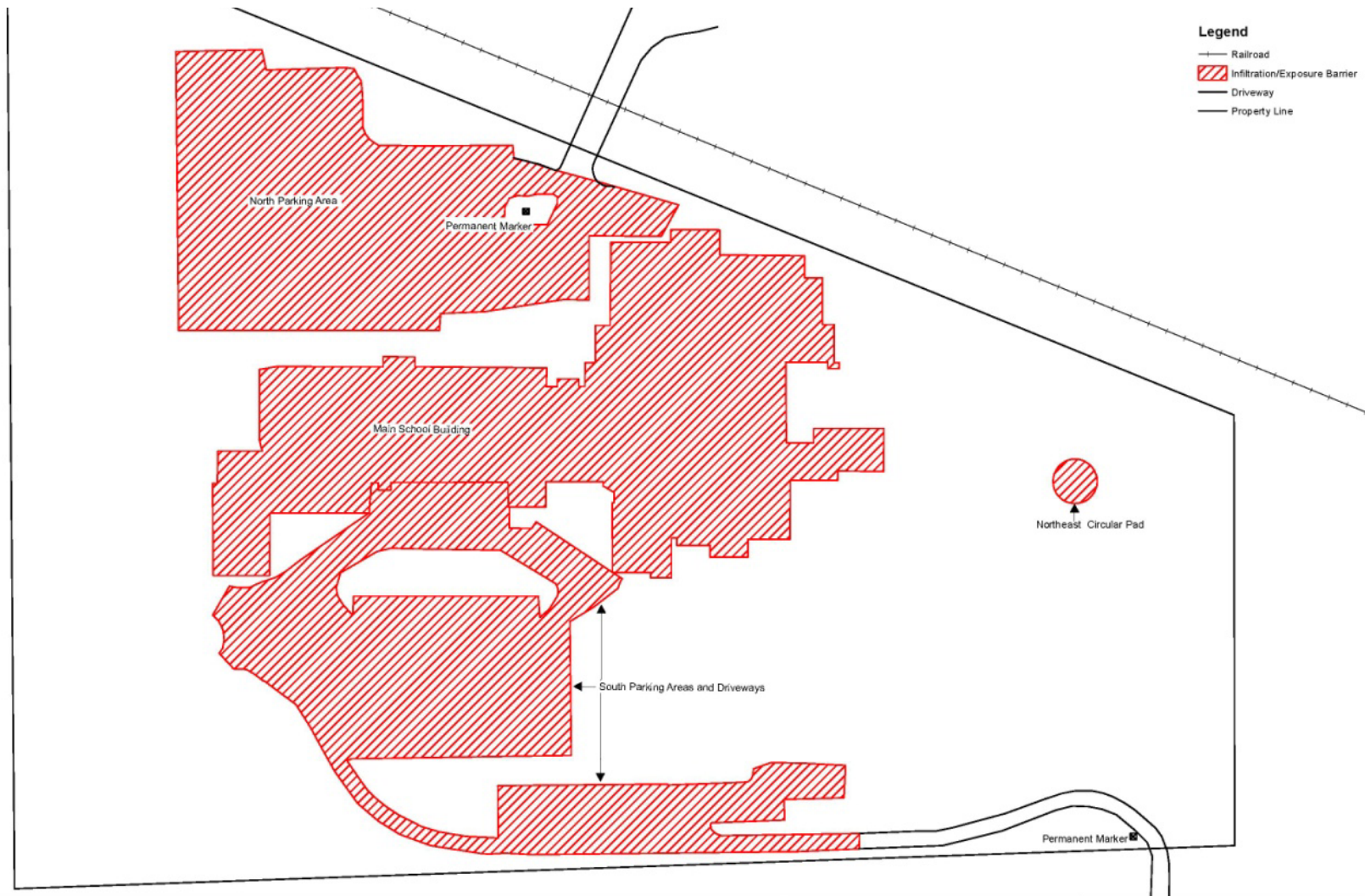
Traverse Bay Area Career Technical Center
880 Parsons Road
Traverse City, Michigan 49686

The TBA Career Tech Center property meets the definition of “facility” as defined in Part 201 of Michigan’s Natural Resources Environmental Protection Act, PA 451 of 1994, as amended, meaning that it has certain areas of contamination that exceed Michigan’s generic residential cleanup criteria. In-situ air sparging remediation activities are being performed in certain areas on the property. A Remedial Action Plan (RAP) has been approved by the Michigan Department of Environmental Quality for the site, which outlines the actions that are being taken to address these areas of contamination. A Restrictive Covenant is in place on the property.

The following information summarizes site conditions, which may potentially affect subsurface work (e.g., excavation or below-grade activities) at the TBA Career Tech Center property:

1. Groundwater wells are prohibited on the property. The exceptions to this prohibition are 1) the construction of wells needed to implement the RAP, or 2) the temporary construction of wells for dewatering excavations.
2. Excavation or intrusive activities are prohibited in certain areas of the property where infiltration/exposure barriers are maintained (i.e., designated large pavement areas and the existing main TBA building footprint – see Figure 1 attached). Temporary removal of the pavement and excavation of soils is allowed, provided the pavement is restored within 14 days of completion of the work.
3. Activities which could interfere with the implementation of remediation activities are prohibited. Planned subsurface activities must be reviewed and approved by TBAISD prior to start of any subsurface work on the property.
4. The TBA Career Tech Center must properly manage any soils, media (e.g., groundwater), and/or debris generated during excavation activities on the property. If soil, media or debris generated during excavation activities are considered “contaminated” by sources on the TBA property to the extent they could not be returned to the excavation, then they will be managed by TBAISD and AK Steel. During excavations, soils will be managed according to a Soil Management Plan (see attached soil management flowchart). Dewatering water will be managed as a liquid industrial waste.

Figure 1 – Infiltration/Exposure Barriers



TBA Career Tech Center Soil Management Flowchart

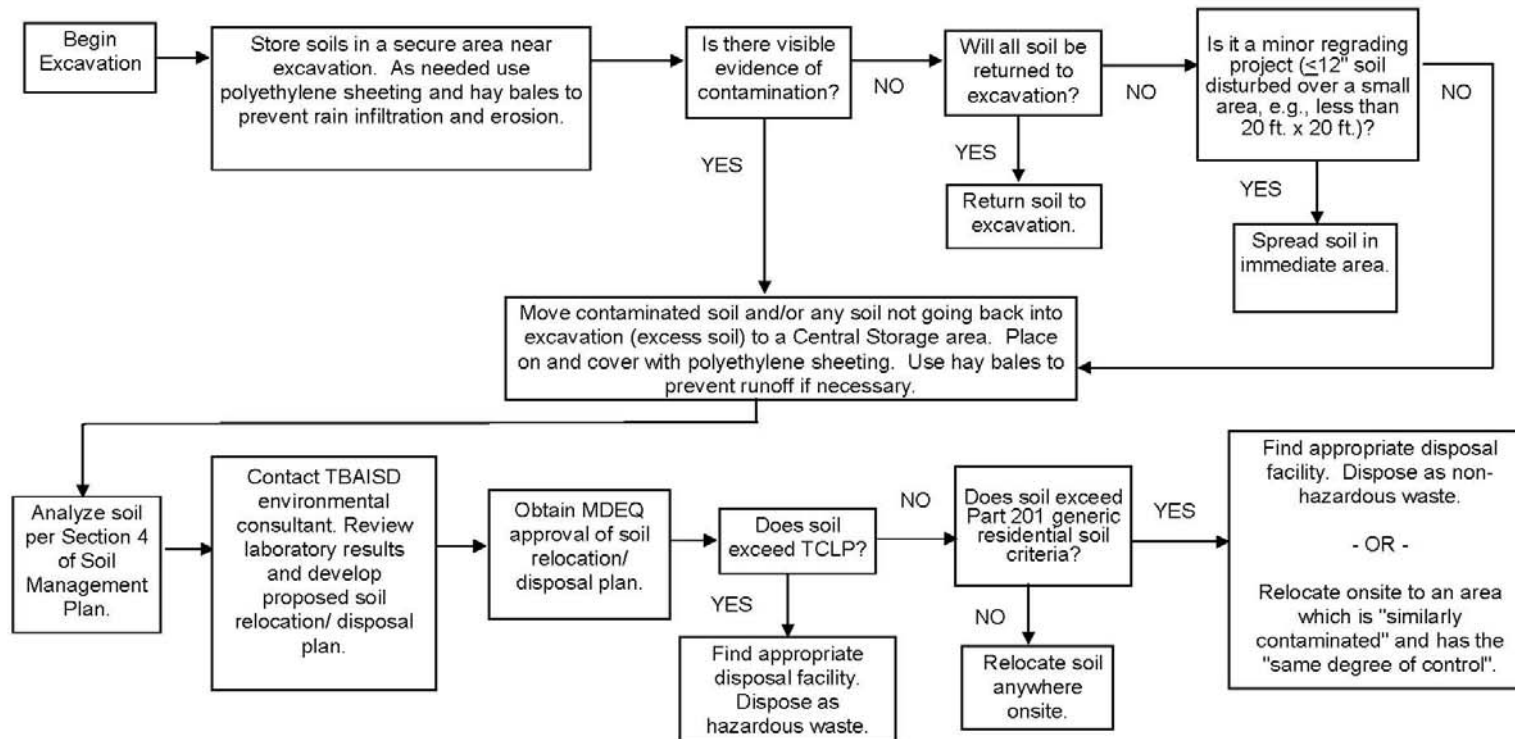


Figure 4-2 from Due Care Plan