Draft Technical Memorandum

TO: Amy Keranen, MDEQ-RRD

FROM: Alexandra Clark, WESTON
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DATE: 25 March 2005

SUBJECT: Tamarack City Stamp Mill Site Analytical Data Review and Evaluation

Weston Solutions of Michigan, Inc. (WESTON®) has conducted an analytical data review for the Tamarack City Stamp Mill Site (Site). This review was used to assess the nature of chemical hazards in surficial soil to potentially be addressed during the interim response (IR) activities, and to evaluate additional Site investigation needs after the IR has been completed. This task is outlined in the *Work Plan for Interim Response Activities* (WESTON, November 2004). WESTON reviewed existing Michigan Department of Environmental Quality (MDEQ) file information to perform this task. The analytical data was compared to current MDEQ Part 201 Residential and Commercial I Direct Contact (DC) and Particulate Soil Inhalation (PSI) criteria. The property is owned by Osceola Township and was previously divided into two areas. WESTON's focus is on the northeastern area, which is shown in **Figure 1 and Figure 2** and defined by the "Site Boundary" line.

DATA SOURCES

The documents used for the analytical data review were the Baseline Environmental Assessment (BEA), which was conducted by the Upper Peninsula Engineers and Architects (UPEA), on behalf of Osceola Township in fall 2001 and the Brownfield Redevelopment Assessment (BFRA), which was conducted by the MDEQ in October 2001. All samples collected during the BFRA were analyzed for volatile organic compounds (VOC), semi-volatile organic compounds (SVOC), inorganics and polychlorinated biphenyls (PCB)/pesticides. Samples collected during the BEA were analyzed for inorganic content and a combination of VOCs, SVOCs, polynuclear aromatic hydrocarbons (PNAs), and/or PCBs/pesticides.

The BEA included five surficial soil samples (three of which were within the Site boundaries).

The BFRA included the following samples:

- Twenty-five surficial soil samples.
- Fifty-three x-ray fluorescence (XRF) readings.
- Ten soil boring samples.

- Six groundwater samples from temporary monitoring well locations.

WESTON performed a review of ten percent of the BEA and BFRA analytical data to compare the transfer of the analytical raw data to the summary tables. No discrepancies were noted between the raw data and report tables.

EXPOSURE PATHWAYS

The historic analytical data was compared to the current Part 201 Generic criteria due to the MDEQ Part 201 criteria update in 2002. The DC and PSI exposure pathways were contemplated during this data review as these are considered to be the most likely routes of exposure to future occupants/visitors to the Site. Therefore, chemical concentrations in surface soil above these criteria could inhibit redevelopment. Residential and Commercial I criteria were used because the Site is located in a residential area and this criteria is the most restrictive, and will therefore be most protective of future occupants/visitors. Specifically, these two exposure pathways are considered most relevant based on the following rationale:

- DC – The planned future use of the property is likely a historic park. Contact with surficial materials and structures by visitors is expected. If DC issues exist, measures must be taken to minimize contact.

- PSI – Because the planned future use of the property is likely a historic park, inhalation of surface particles is probable because the ground surface consists of loose soils which could be easily airborne. If PSI issues exist on-site, measures must be taken to minimize exposure.

DISCUSSION OF SAMPLING LOCATIONS

BEA Samples

Three of the five surficial soil samples collected during the BEA are located on the Site. Two of the three locations on the Site exceeded DC and/or PSI criteria. The contaminants that exceeded the DC criteria were arsenic, copper, lead, and benzo(a)pyrene. Copper also exceeded PSI criteria at one location. The summary of criteria exceedances for BEA soil samples are included in **Figure 1**.

BFRA Samples

- Surficial Soil Samples – A total of 25 surficial soil samples were collected as part of the MDEQ BFRA. Six of these locations on the Site contained concentrations of arsenic, lead and/or benzo(a)pyrene that exceeded DC criteria. None of the locations sampled on the Site contained contaminants exceeding the PSI criteria. The summary of criteria exceedances for surficial soil samples are included in **Figure 1**.

- XRF Readings (Soil) – A total of 19 readings were collected for surficial soil with the XRF

unit which analyzes inorganic contaminants. Five of those locations exceeded DC and/or PSI criteria. Lead, copper, mercury, and arsenic exceeded DC criteria and copper also exceeded PSI criteria. A summary of criteria exceedances for surficial soil readings are included in **Figure 1**. Of note, in some cases, there were significant discrepancies between XRF readings and laboratory analytical data for locations where XRF readings were recorded and a laboratory sample was collected (i.e. SS-13/SS-13X and SS-9/SS-9X). While XRF is a useful field screening instrument, WESTON considers laboratory analytical data to be more reliable than XRF.

- XRF Readings (Structures/Materials) – A total of 44 XRF readings were collected from structures and other suspect materials. Suspect materials included: paint, staining and objects thought to contain hazardous materials. A number of these locations exceeded DC and/or PSI criteria. Lead, arsenic, copper, cobalt, and iron exceeded DC criteria. Arsenic, copper, and manganese exceeded PSI criteria. A summary of exceedances for the structural and suspect material readings are included in **Figure 2**.

- Subsurface Soil Samples – A total of 10 samples were collected from soil borings located on the Site. No exceedances of either DC or PSI criteria were noted. During the BFRA, site-specific background contaminant concentrations, were evaluated using the results from the soil sample collected from SB-1. Various metals (namely copper) were detected above the site-specific background as well as Part 201 statewide default criteria. Of note, the copper concentration detected in the sample collected from SB-1 also exceeded Part 201 statewide default indicating that copper concentrations are regionally elevated on and near the Site. Eight of the 10 subsurface soil samples exceeded Part 201 Groundwater Surface Water Interface (GSI) Protection criteria. However, because the locations do not exceed the DC or the PSI criteria the data is not discussed further.

- Temporary Monitoring Wells – Groundwater samples were collected from six temporary monitoring wells during the MDEQ BFRA. Samples collected from five of the six temporary monitoring well locations exceeded Part 201 GSI and/or Residential and Commercial I Drinking Water criteria. The most prevalent contaminant was copper. Of note, there is no indication in the BFRA whether the groundwater samples were filtered in the field or in the laboratory. However, there is an indication that most of the groundwater samples collected reportedly contained varying amounts of silt or were turbid. Thus, the elevated metal concentrations may be attributable to suspended solids containing elevated metal concentrations and may not be representative of the actual groundwater conditions. The sample collected from TMW-6 is the best illustration. Comments in the field notes indicate the groundwater extracted at this location "started very muddy, never cleared but became cloudy" and the sample contains the highest contaminant concentrations for groundwater samples.

The temporary monitoring well locations are shown in **Figure 1 and Figure 2**. Although the contaminant concentrations above GSI criteria can be considered a threat to the receiving surface water body (Torch Lake), it is not anticipated that the contaminants detected in the groundwater samples will inhibit redevelopment. Elevated pH measurements recorded for TMW-2 and TMW-3 (11.25 and 10.07, respectively) were initially of concern. WESTON reviewed the BFRA field notes and it was noted that the pH equipment had been malfunctioning which likely accounts for the elevated readings.

CONCLUSION

After reviewing the analytical data, it is evident that surface soils and standing structures are the main media of concern at the Site. This determination is based on contaminant concentrations at the surface above DC and PSI criteria.

While limited XRF readings were collected for concrete rubble piles and standing structures, it does not appear that concrete surfaces have been sampled for laboratory analysis. Based on Site visits performed to date, the concrete rubble piles appear to meet the definition of "inert" according to Part 115, Solid Waste Management, of the Michigan Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451, as amended. However, not all of the concrete surfaces in the rubble piles are exposed to allow for visual inspection. Therefore, WESTON assumes the concrete rubble piles will be treated as "inert" material for the purposes of the IR unless newly exposed (during the IR) concrete surfaces within the rubble piles suggest otherwise due to the presence of surface coatings. If newly exposed concrete rubble surfaces suggest the material is "non-inert", sampling of the material should be performed and/or the material should be segregated from the "inert" material and either remain on site or be disposed of properly.

RECOMMENDATIONS

WESTON offers the following recommendations for the IR and future response activities at the Tamarack City Stamp Mill Site:

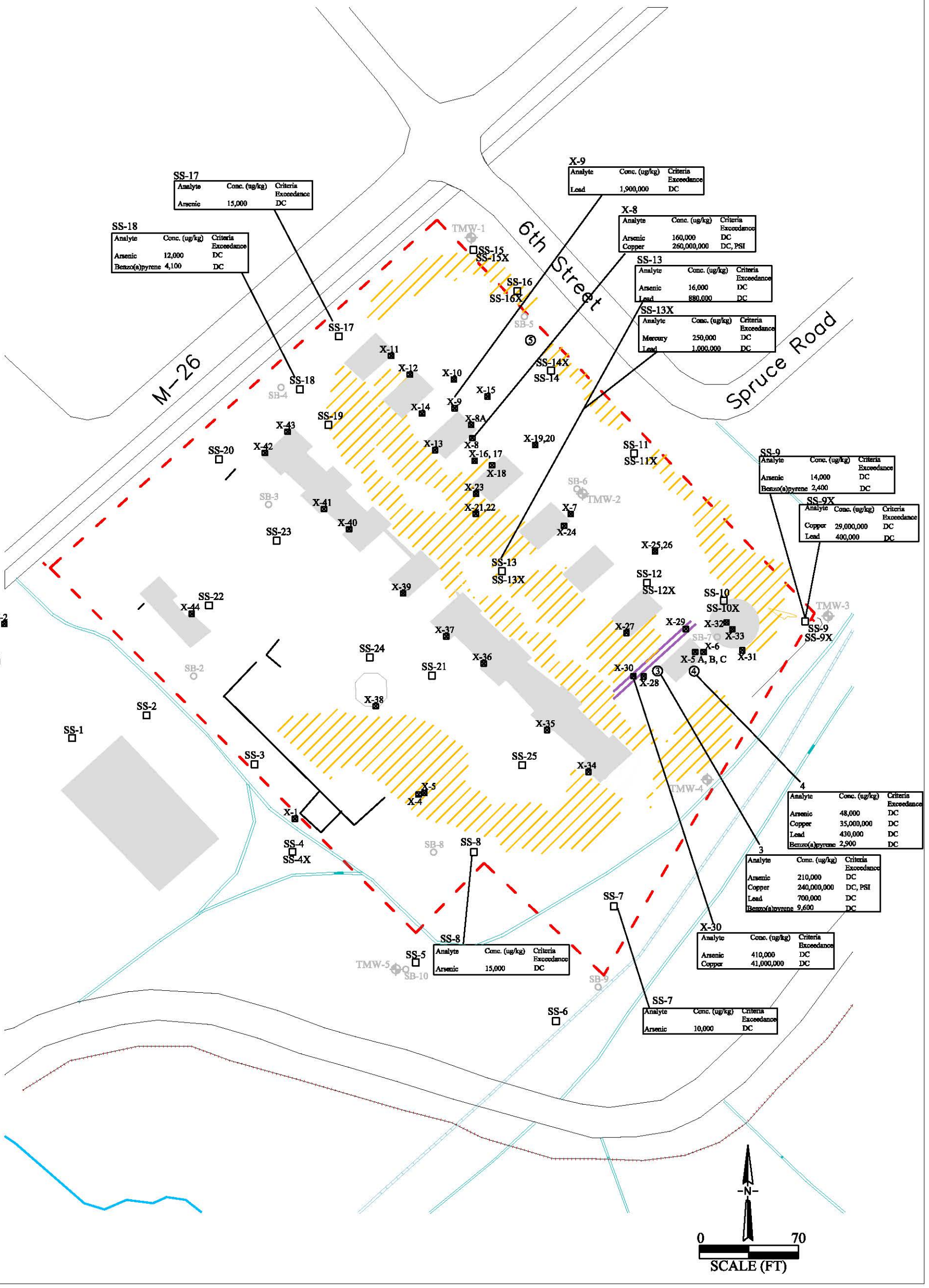
- Collect samples of the surficial material of the standing structures (i.e. concrete and paint) for laboratory analysis of inorganics to verify the XRF readings of the surface materials that may pose a future inhalation/DC risk to occupants and/or visitors. If inorganic contaminants are detected above DC and PSI, the potential risk of exposure to future Site visitors/area residents must be evaluated and the risks, if any, should be mitigated.

- Cap the exposed ground surfaces with clay, topsoil or other applicable material to reduce DC and PSI hazards to future Site visitors/area residents. Based on the BFRA and BEA sampling results, these areas are largely limited to the northern and eastern portions of the Site. Covering of the exposed ground surfaces will be consistent with the intended future use of the Site and the surrounding property uses.

- Collect additional groundwater samples using low flow sampling procedures or grab samples with filtering to analyze metal concentrations that are representative of actual groundwater conditions. This will allow for more effective evaluation of the threats (if any) posed to the receiving surface water body and/or threats posed by groundwater used as a drinking water source.

Attachments

FIGURES



Approximate Site Boundary
Fence Line
Two Track Access Road
Rail Line Tracks
Concrete Foundations
Concrete Structures
Rubble Piles
TMW-1 Temporary Monitoring Well Locations - BFRA

SS-1 □ Surficial Soil Sampling Location - BFRA
X-1 ⊠ X-Ray Flouresence (XRF) Sampling Location. Locations Labeled SS-10X are also XRF Sampling Locations - BFRA
SB-1 ○ Soil Boring Sampling Location - BFRA
③ Surficial Soil Sampling Location - BEA
DC = Direct Contact
PSI = Particulate Soil Inhalation

Call out boxes are used for locations that exceed Direct Contact and/or Particulate Soil Inhalation criteria and are located on the Site.

Sampling locations are approximated based on historic figures in the BEA and BFRA.

FIGURE 1

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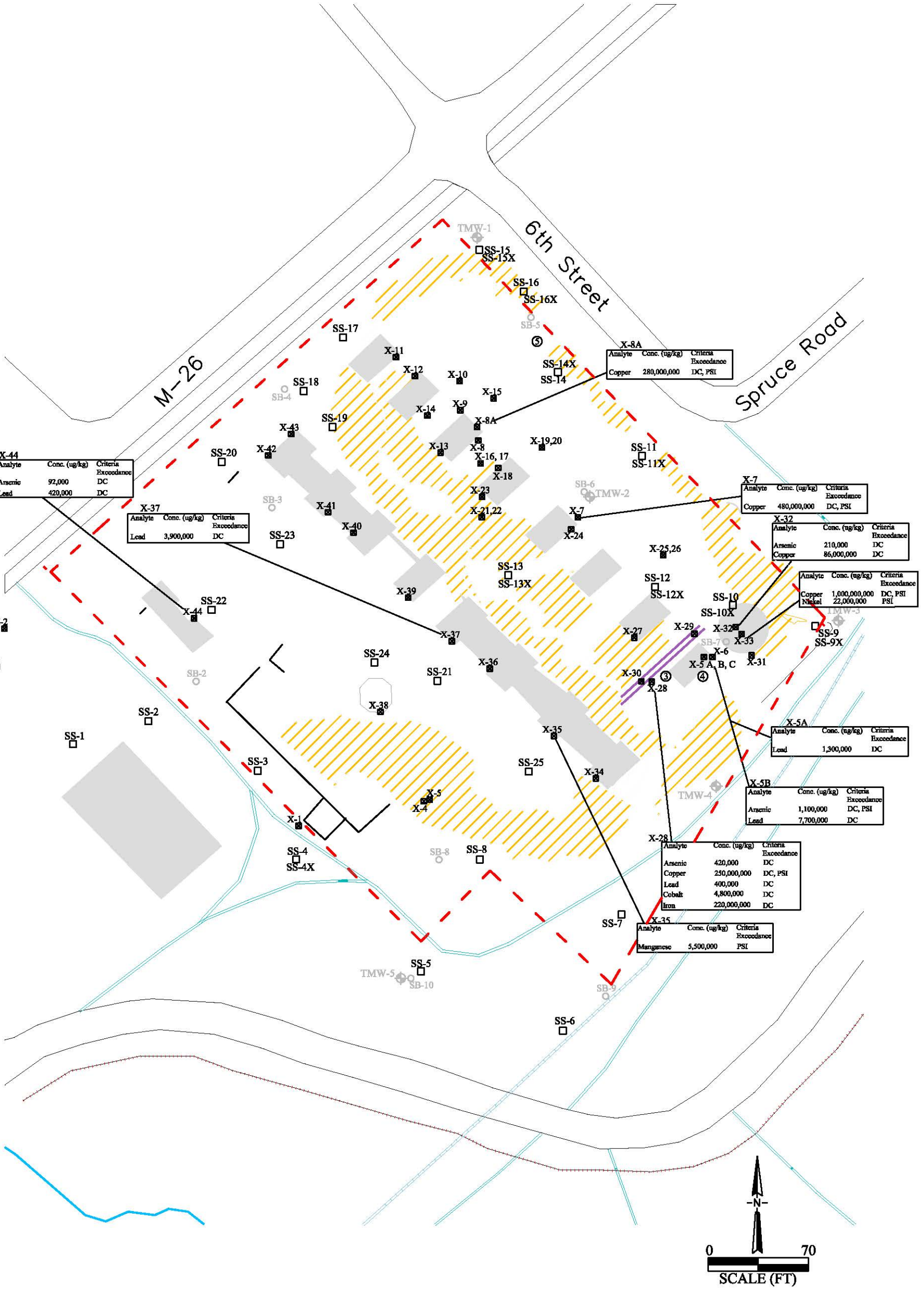
SURFICIAL SOIL EXCEEDANCES
TAMARACK CITY STAMP MILL SITE
TAMARACK CITY, HOUGHTON COUNTY, MI



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Sampling locations are approximated based on historic figures in the BEA and BFRA.

FIGURE 2

File and Path: HMI\PROJECTS\TCSM\DataEvaluationTM\Figures\Figure2.dwg	Designed By: MDEQ	Drawn By: ASD	Checked By: DPL	Approved By: ALC

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CONCRETE STRUCTURE AND SUSPECT MATERIAL EXCEEDANCES
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