REMEDIAL ACTION PLAN, REVISION 1

SHEBOYGAN RIVER AND HARBOR SUPERFUND SITE
TECUMSEH DEWATERING SITE, SHEBOYGAN FALLS, WI AND
MARYLAND AVENUE DEWATERING SITE, SHEBOYGAN, WI

SME Project Number: 069638.00.034.001

November 8, 2018

SME

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APPENDIX A

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1. INTRODUCTION

We prepared this Remedial Action Plan (RAP) to address previously undiscovered, historical polychlorinated biphenyl (PCB) impact in soils at the Tecumseh Falls dewatering facility of the Sheboygan River and Harbor Superfund Site (Site). The PCB impact was discovered during the post remedial sampling of the facility to evaluate the potential that release of sediment during dewatering may have affected the soil. The RAP is also intended to address the Maryland Avenue dewatering facility where lead and polynuclear aromatic hydrocarbons (PAHs) were encountered in shallow soils at concentrations exceeding commercial/industrial preliminary remedial goals (PRGs).

The objective of this RAP is to evaluate the need for remediation at the two dewatering sites and the remedial options to protect human health and the environment. Descriptions of the Site history and known current environmental conditions; data evaluation, proposed remedial methods, reporting; and the estimated project schedule are presented in the following sections.

2. SITE HISTORY AND CURRENT CONDITIONS

The following subsections summarizes the Site history, current Site conditions, and environmental conditions identified during previous investigations of the Property.

2.1 SITE HISTORY

Tecumseh, a manufacturer of refrigeration and air conditioning compressors and gasoline engines, was located adjacent to the Sheboygan River in Sheboygan Falls, Wisconsin. Polychlorinated biphenyls (PCBs) were found in sewer lines that lead to the River from Tecumseh and in hydraulic fluids used in Tecumseh Products Company's Diecast Division manufacturing processes. Prior to remediation, the contamination level was high in the sediments immediately surrounding the Tecumseh Falls Site, but decreased in concentration downstream.

The Record of Decision (ROD) listed the risks at the Sheboygan River and Harbor Superfund site to be from the chemicals of concern, metals and PCBs. Metals, PCBs, and polynuclear aromatic hydrocarbons (PAHs) were the as potential chemicals of concern (PCOC). The metals listed as the target of concern for the Remedial Investigations were cadmium, chromium, copper, lead, mercury, nickel, and zinc. Pesticides, dioxins, and dibenzofurans were not present in the sediment and as such, were no longer PCOC. The ROD required remediation of the Tecumseh site to address the preferential pathways allowing the river to be impacted with sediments and remediation of the PCBs in river sediments.

Between 2003 and 2013, Pollution Risk Services (PRS) and others remediated preferential pathway soils and the river sediments. PRS dewatered the dredged sediment at the Tecumseh Falls and Maryland Avenue sites (Figure 1).

2.2 CURRENT CONDITIONS

Following the sediment remediation activities, the two dewatering sites have remained vacant. In accordance with the approved Sampling and Analysis Plans, SME sampled the areas where one of the geo-tubes broke releasing water outside of the dewatering pads, the wastewater treatment facilities, and the Confined Treatment Facility (CTF) or Sediment Management Facility (SMF) in 2016.

The results of this Phase II ESA demonstrated that soil at the Tecumseh Falls facility is impacted with concentrations of PCBs and PAHs; however, the impact was not the result of dewatering releases or activities by PRS. The impacted soil represents an undiscovered historical release from historical operations that occurred prior the remediation performed by PRS.

The concentrations of PAHs and PCBs at several locations at the Tecumseh Falls facility exceed the 2016 cleanup criteria or screening levels for commercial/industrial receptors. As such, impacted soil in these areas must be addressed through remediation or an engineering control before the Tecumseh facility meets the risk goals. The total cumulative direct contact risk is acceptable for commercial and industrial receptors as long as the soil impacted with PAH and PCB at concentrations above the PCSLs are addressed via remediation or engineering controls. The impacted soil also has the potential to migrate to the river or to nearby properties via two preferential pathways: surface water run-off and leaching to groundwater which then migrates to the river.

There is no residual impact from at the former CTF and SMF from sediment management activities completed by Tecumseh prior the remediation performed by PRS. Figure 2 shows the location of the impacted soil.

The results of this Phase II ESA demonstrated that soil at Maryland Avenue facility was impacted with concentrations of PAHs and lead; however, the impact is not the result of dewatering releases or activities by PRS. The impacted soil represents an undiscovered historical release from historical operations that occurred prior the remediation performed by PRS. The concentrations of PAHs and/or lead at several locations exceeded the 2016 cleanup criteria or screening levels for commercial/industrial receptors (Figure 3). As such, SME evaluated if the impacted soil in these areas need to be addressed to protect human health and the environment.

3. REMEDIAL NEED EVALUATION

3.1 TECUMSEH FALLS

Soils exceed the direct contact standards and need to be addressed. The cleanup goals established during the site investigations were as follows and were based on a 10^{-6} risk:

- PCBs – 8.66 mg/kg
- Benzo(a)anthracene – 29 mg/kg
- Benzo(a)pyrene – 2.9 mg/kg
- Benzo(b)fluoranthene – 20 mg/kg
- Dibenz(a,h)anthracene – 1.8 mg/kg
- Indeno (1,2,3-cd)pyrene – 29 mg/kg.

SME used the most current Regional Screening Levels based on a 10^{-5} risk to derive the PAH cleanup goals applicable to the potential future use of the site. These are as follows:

- Benzo(a)anthracene – 210 mg/kg
- Benzo(a)pyrene – 21 mg/kg
- Benzo(b)fluoranthene – 210 mg/kg
- Dibenz(a,h)anthracene – 21 mg/kg
- Indeno (1,2,3-cd)pyrene – 210 mg/kg.

Figure 4 shows the extent of PAH impacted soils at the Tecumseh site based on the 10^{-5} risk. Evaluation of the lateral and vertical extent of excavation required is provided in Section 4.

SME installed temporary surface water run-off controls to prevent migration of the impacted soils until we perform remedial activities. Please reference SME Serial Letter #39 (August 10, 2017) for a discussion of the controls and Serial Letter #42 (10/5/2018) for photographs of the installed silt fence.

3.2 MARYLAND AVENUE

The impacted soil is limited to four sample locations and exposure to only those soils would not be a representative site exposure to future receptors. The USEPA guidance *Calculating Upper Confidence Limit for Exposure Point Concentration at Hazardous Waste Sites* (OSWER 9285 6-10), is an update to the *Risk Assessment Guidance Document for Superfund* (RAGs). This guidance states: "Unless there is site-specific evidence to the contrary, an individual receptor is assumed to be equally exposed to media within all portions of the exposure unit over time frame of the risk assessment." RAGs stated the USEPA recommends using the average concentrations to represent "a reasonable estimate of the concentration over time." However, the OSWER update recommended using a 95% UCL as a reasonable exposure point concentration.

The concentrations of the chemicals of concern (COCs) that exceeded the 2016 screening levels at the Maryland Avenue facility are summarized below. The average COC concentrations in the soil intervals within the POC are provided demonstrating that within the POC, only the concentrations of benzo[a]pyrene are close to the screening level. However, all of the COCs will be evaluated by comparing the 95% UCL to the screening levels.

CHEMICALS OF CONCERN			SAMPLE DEPTH INTERVAL			AVERAGE	2018 RSL OR CLEANUP CRITERIA[1]
			0-0.5	0.5-1.5	1.5-3.5		
Samples	B1	Benzo[a]pyrene	6.92	0.414	0.0406	2.5	21
	B1-1W		4.28	0.102	<0.0032	1.46	
	H4	Benzo[a]pyrene	27.7	2.02	1.97	10.6	21
		Benzo[b]fluoranthene	32.5	2.61	2.31	12.5	210
		Lead	1,530	219	174	641	800
	H4-2NW	Benzo[a]anthracene	29.2	4.00	0.387	11.2	210
		Benzo[a]pyrene	23.2	3.73	0.455	9.1	21
		Benzo[b]fluoranthene	38.2	5.68	0.569	14.8	210

Results in mg/kg.

[1] Using 10^{-5} carcinogenic risk and THQ of 1.0

SME calculated the 95% UCL using the UEPA program, ProUCL. The results are summarized below and are provided in Appendix A.

CHEMICAL OF CONCERN	EXPOSURE POINT CONCENTRATION	RSL OR CLEANUP CRITERIA
Benzo[a]pyrene	5.21	21
Benzo[a]anthracene	3.48	210
Benzo[b]fluoranthene	8.04	210
Lead	175	800

Results in mg/kg.

The exposure point concentrations are less than the screening level and exposure to site soils does not pose and unacceptable risk at a carcinogenic risk of 10^{-5} and THQ of 1.0. Groundwater was not encountered during the investigation but there is a potential that the residual soil impact could migrate to groundwater. WDNR states in NR 720, "With the exception of naphthalene, PAH compounds are

generally only of concern for direct contact due to their relatively low migration potential. In WDNR publication RR-087, WDNR lists the concentrations of PAHs based on the Soil to Groundwater residual contaminant level (RCL). The concentrations at the Maryland Avenue site are less that these RCLs. Therefore, the soil impacted with PAHs does not appear to present a risk to groundwater. The vertical distribution of the PAHs is consistent with this conclusion.

According to the WDNR NR 720 RR Soil RCL Worksheet, the lead concentration protective of groundwater is either 13.5 or 27 mg/kg depending on the Dilution Attenuation Factor. However, the United States Geological Survey reports the state background concentrations for lead have a mean of 17.8 mg/kg and a 95% UCL of 30.1 mg/kg. The background concentrations of lead in soil compared to the RCL Worksheet implies all of the groundwater in Wisconsin is impacted with lead. However, WDNR reports in their brochure, *Lead in Drinking Water*, that "Most Wisconsin drinking water sources, either wells or lake water intakes, have little or no measurable lead." As such, the RCL defaults are extremely conservative and should be viewed as only a screening level. The following provides a weight of evidence approach as why lead at the site will not impact groundwater. This table is based on several facts affecting groundwater use in the area. Drinking water in the City of Sheboygan is obtained from Lake Michigan. According to the WDNR Drinking Water Well Database, the closest potable water well to the Maryland Avenue site is located at 2605 Indiana Avenue, 2,400 feet to the southwest. The well is 150 feet deep and obtains groundwater from the limestone aquifer. This aquifer is separated from a shallow sand layer (4-14 feet bgs) by 61 feet of clay. The limestone aquifer is encountered at 75 feet bgs.

WEIGHT-OF-EVIDENCE SUMMARY FOR LEAD
MARYLAND AVENUE

FACTOR	VALUE(S)	COMMENT
Separation Distance	≈75 feet	This distance indicates there is a low probability that the impacted soil near the surface will migrate to the groundwater used for drinking water. In borings where lead was analyzed at each sampling interval, the concentration of lead decreases with depth. Based on monitoring wells at the Tecumseh site, water is found in a shallow sand layer encountered at approximately 8 feet bgs.
Representative Concentration	175 mg/kg	Lead levels above background concentration of 30.1 mg/kg were present in two locations at depths below 0.5 feet.
Partition Coefficient (Kd)	1,950 to 10,760 L/kg	Lead has a very high Kd indicating that it does not have the tendency to leach to groundwater.
Solubility	Insoluble to soluble	Literature indicates all but two forms of lead (salts, carbonates, sulphates, etc.) are insoluble in water at ambient temperatures. Only lead acetate and lead nitrate are soluble. Lead acetate is highly soluble but does not occur in nature as it is manufactured with lead and acetic acid. Lead nitrate is also not found in nature as is the byproduct of mixing lead and nitric acid.
Secondary Features	None	There are no fractures or deep utilities that would aid migration of leachate to groundwater.
Other	Migration Potential	According to the Sheboygan County Soil Survey, soils in this area have a pH above 7 and a cation exchange capacity of more than 10 me/100 grams. These soil characteristics increase retardation factor and reduce leaching.

The residual impact poses no threat to receptors or groundwater. As such, SME and PRS recommended that no further action is required at the Maryland Avenue facility.

4. TECUMSEH REMEDIAL EXTENT EVALUATION

The Phase II and delineation investigations have defined the extent of PAH and PCB impact at the site. Figures 4 through 6 depicts the extent of impact above the direct contact cleanup levels. The PAH impacted soil extends to a depth of no more than 4 feet below ground surface (bgs). Approximately 244 cubic feet of soil is impacted with PAHs exceeding acceptable risk levels (Figure 4).

The extent of PCB impact is dependent on using the Wisconsin direct contact point of compliance of 0 to 4 feet bgs[1] as a cleanup or capping requirement or using all PCB impacted soils as the cleanup or capping requirement. Figures 5 and 6 show the extent of impact depending on the depth of impact that has to be addressed. Depending on the depth of soil to be remediated to address PCBs, there is 5,448 to 17,195 cubic yards of soil. The 95% UCL for the PCBs in soil is 1,124 mg/kg. In the event of off-site disposal, all of the soil has to be disposed in a TSCA waste landfill.

During the supplemental delineation assessment of the PCB impacted soils at the Tecumseh site, SME collected samples for Synthetic Precipitation Leaching Procedure (SPLP) analysis to assess the propensity of PCB to leach from the soil. This information will allow a determination of the concentrations that are protective of the leaching to groundwater pathway. Empirical evidence from the 2016 and 2017 investigations of this site indicates PCB concentrations as high as 15,000 mg/kg may not significantly leach to groundwater. At sample location S15-1W, the PCB concentration is 1,030 mg/kg from 0-0.5 feet bgs reducing to 0.938 mg/kg at 1.5 to 3.5 feet bgs. The SPLP test provided evidence that PCBs would leach to groundwater. However, evidence that PCBs will not leach to groundwater is that groundwater results from the two monitoring wells down-gradient of the most impacted area, MW10 and MW12, have seen decreases in PCB concentrations of 45% and 65% respectively. In addition, BB&L installed a shallow and deep well in the area, MW7S and MW7D, and sampled the wells for total and dissolved PCBs. No PCBs were detected in the groundwater. A groundwater interceptor trench is present in the event the concentrations in groundwater increase. Use of the trench has never been necessary. Based on the foregoing, leaching to groundwater is not a pathway to consider when determining the vertical extent of impact that must be removed.

Based on the results, the soil impact will have to be addressed to protect the public from direct contact with soil. During the remediation, steps should be taken to reduce the chance that PCBs may leach to groundwater.

5. ANALYSIS OF REMEDIAL ALTERNATIVES

5.1 EVALUATION CRITERIA

An analysis of remedial alternatives was completed based on three criteria: Threshold, Balancing, and Modifying. The criteria provided decision makers adequate information to allow the selection of an appropriate remedy of the Property. Additional information on the criteria used to select the most appropriate remedial method are described below.

- The Threshold Criteria include:
  - Protection of Human Health and the Environment
  - Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

[1] WDNR Publication RR-968, RR-709, RR-528, and WDNR Form 4400-202.

- The Balancing Criteria include:
  - Long and Short-Term Effectiveness
  - Reduction in Toxicity or Mobility
  - Implementability
  - Cost
- The Modifying Criteria include:
  - Community Support
  - Responsible Party Support
  - State Support

In preparation of this RAP, we developed Site-Specific cleanup levels (Section 3.1) based on the Property's future use and estimated the extent of impact requiring remediation. The ability of remedial alternatives to meet these standards in the short and long-term will help meet one of the Threshold Criteria. As part of this criteria, we evaluated the ARARs to determine if there are other local, state, or federal criteria that must be met as well as those applicable to the remedial action such as storm-water control, fugitive or particulate emissions control, and prohibition of nuisances.

We also evaluated the range of possible costs for each remedial alternative, the effectiveness of each alternative, and the ability to meet the Site-specific standards. In addition, we evaluated the ability of the alternatives to gain state and community (parents of students) support through outreach efforts.

5.2 POTENTIAL REMEDIAL ALTERNATIVES

We reviewed the following documents for a list of potential remedial alternatives.

- USEPA, *Technology Alternatives for the Remediation of PCB Contaminated Soils and Sediments*, EPA/600/S-13/079.
- Los Alamos National Laboratory, *A Compendium of Cost Data for Environmental Remediation Technologies*, August 1996.
- USEPA, *The Feasibility Study: Detailed Analysis of Remedial Action Alternatives*, March 1990.
- Goldstein, Mike and Ritterling, Jon, *A Practical Guide to Estimating Cleanup Costs*, USEPA Papers, Paper 30, January 2001.
- USEPA, *Guidance for Conducting Treatability Studies Under CERCLA*, October 1992.
- USEPA, Table 3-2: Treatment Technologies Screening Matrix.
- Dadrasnia, Arezo, Shahsavari, N., and Emenike, C.U., *Remediation of Contaminated Sites*, 2013.
- Mouvet, Christophe and Colombano, Stefan, *Remediation Technologies for PAH Contaminated Soils*, October 2012.

These documents provided the following remedial alternatives that may be effective for PCBs:

- Soil Removal and Off-site Disposal or Incineration
- In Situ Treatment
  - No Action/Natural Attenuation
  - Biological Treatment
    - Bioremediation

        - Phytoremediation
    - Engineering Control (Capping)
    - Vitrification
    - Solvent Extraction
    - Solidification
    - Nano-Valent Iron Reductive Dechlorination
    - Sorbent Polymer Extraction and Remediation System (SPEARS)
- Ex Situ Treatment
    - Chemical Treatment
    - Vitrification
    - Bioremediation

5.3 SCREENING LEVEL EVALUATION OF REMEDIAL ALTERNATIVES

Of the potential remedial alternatives listed in Section 5.2, SME performed a screening level evaluation of the remedial alternatives with the exception of "No Action" (Table 1). The screening evaluation was based on each of the three main criteria discussed in Section 5.1: overall protection of human health, relative cost, and community support. The following provides a summary of this evaluation of the top alternatives, based on the screening evaluation.

REMEDIAL ALTERNATIVE	SCREENING EVALUATION SCORE	RELATIVE COST	COMMENT
1. Soil Removal	62.5	>$10,00,000	Relatively fast to implement
2. Engineering Control	62.5	<$500,000	Fastest to implement and is consistent with current engineering control
3. In-Situ Bioremediation	55	<$1,000,000	A lengthy process

5.4 DETAILED EVALUATION OF APPLICABLE REMEDIAL ALTERNATIVES

Of the three remedial alternatives identified by SME to be most effective, we performed a detailed evaluation of the alternatives based on all of the criteria using a scoring spreadsheet developed based on the guidance document, *Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA*. Appendix B provides the results of this evaluation. A summary of the scores for each remedial alternative evaluated is provided in the following table.

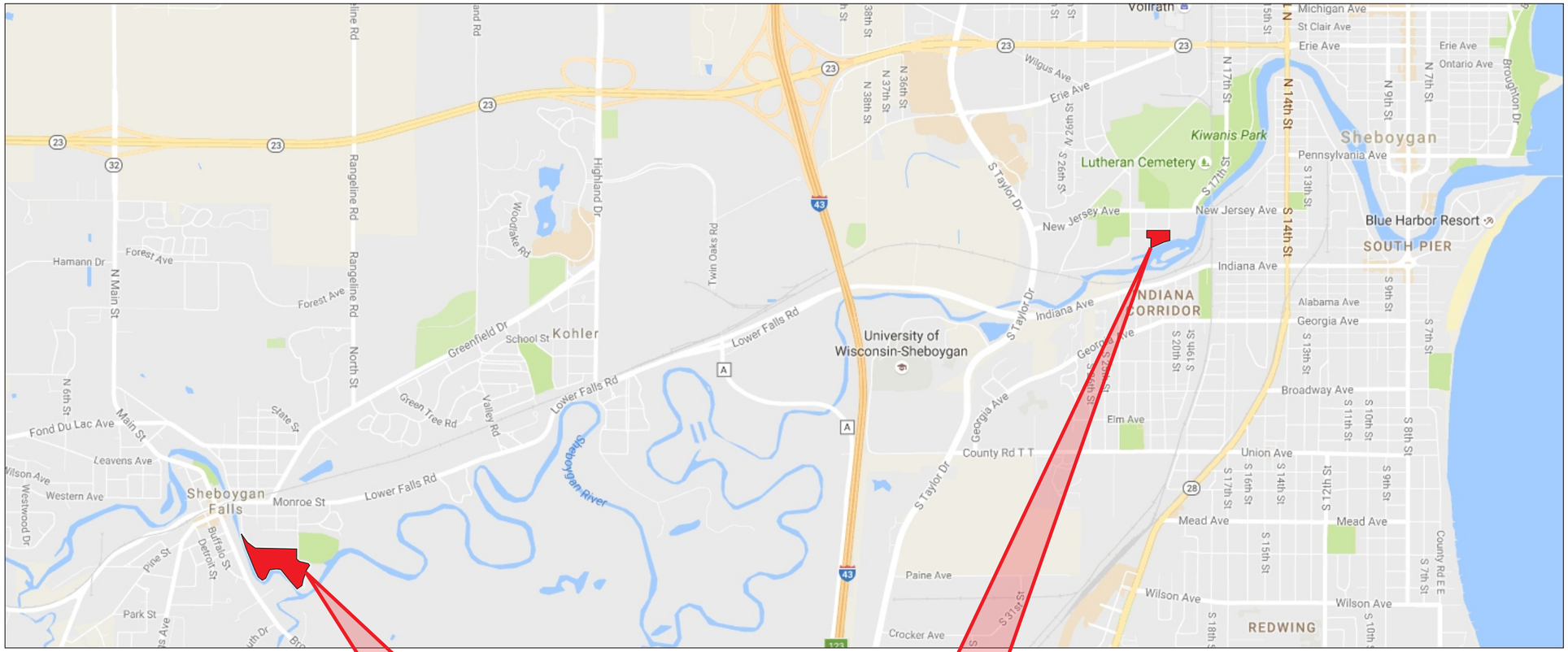
REMEDIAL ALTERNATIVE	DETAILED ANALYSIS SCORE	RELATIVE COST	COMMENT
1. Soil Removal	81	>$10,00,000	Based on score, select Engineering Control
2. Engineering Control	81	<$500,000	
3. In-Situ Bioremediation	80	<$1,000,000	

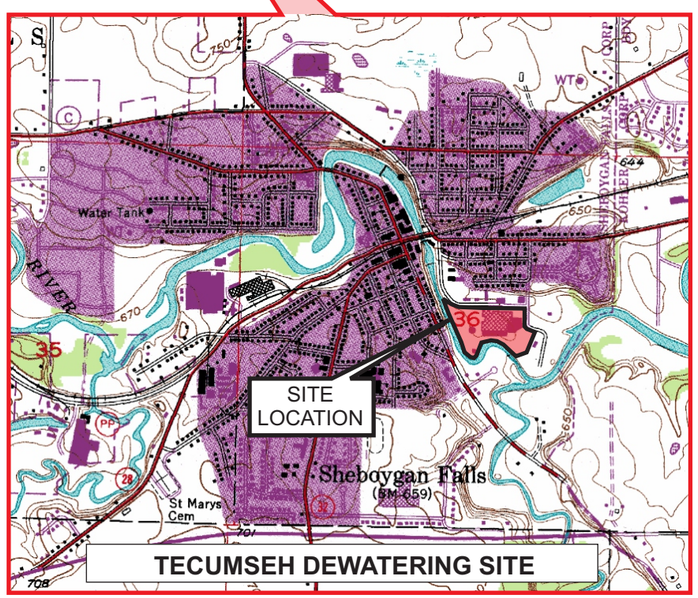
Both the screening evaluation and the detailed analysis scoring demonstrate the Alternative 2 should be the selected remedy. Capping is consistent with WDNR philosophy as discussed in Section 3.2 of RR-528 that "A soil performance standard implemented to protect human health from direct contact would typically involve capping the contaminated soil".

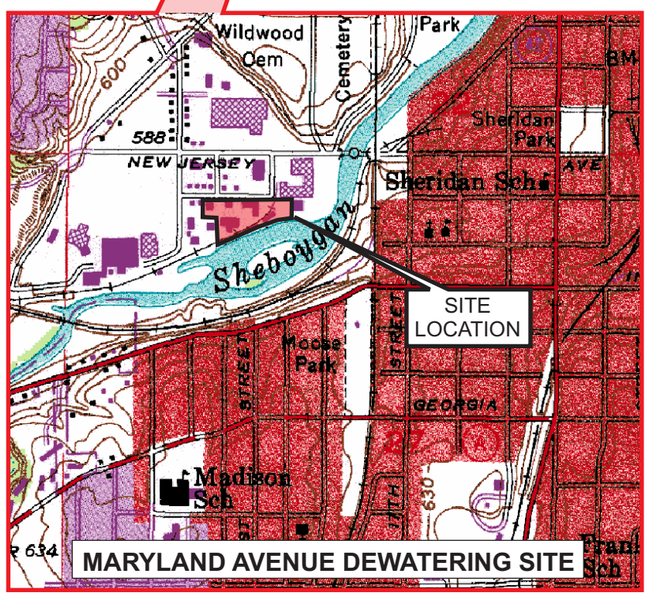
6. CONCLUSIONS

The soil at the Tecumseh Falls facility should be capped to protect the public and groundwater. The soil at the Maryland Avenue facility does not pose a risk to the public.

FIGURES







NOTE: DRAWING INFORMATION TAKEN FROM GOOGLE MAPS AND USGS 7.5-MINUTE TOPOGRAPHIC MAPS OF THE SHEBOYGAN SOUTH AND SHEBOYGAN FALLS QUADRANGLES, WISCONSIN, 1994.

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Project

SHEBOYGAN RIVER AND HARBOR SUPERFUND SITES

ProjectLocation

SHEBOYGAN AND SHEBOYGAN FALLS, WISCONSIN

Sheet Name

DEWATERING SITES LOCATION MAP

No.	Revision Date

Date 9-12-2016

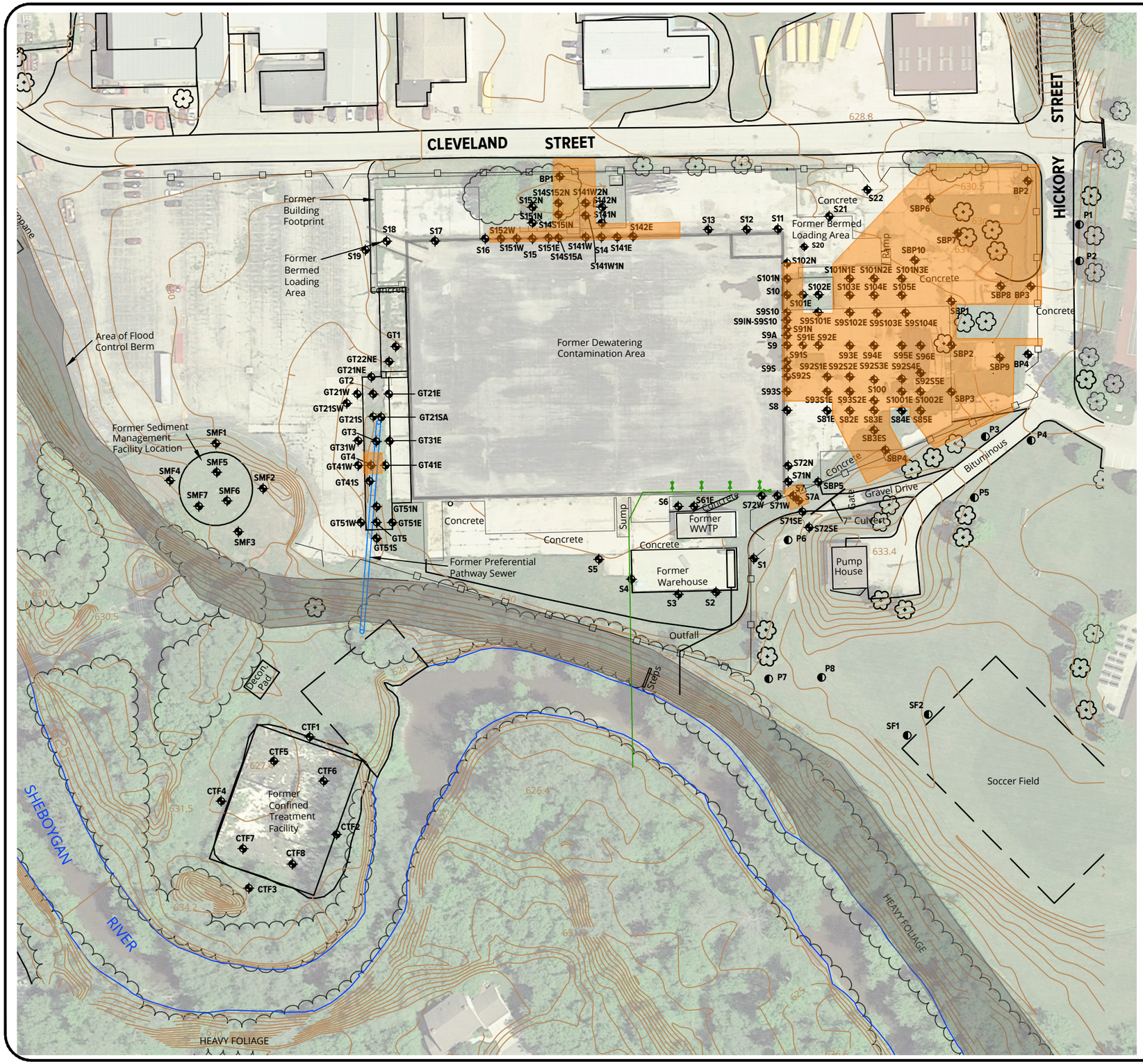
CADD JWH

Designer JWH

Scale NOT TO SCALE

Project 069638.00.024.001

Figure No. 1



0' 100' 200'

GRAPHIC SCALE: 1" = 100'

LEGEND

- EXISTING EDGE OF WATER
- EXISTING FENCE
- EXISTING TREE AND/OR BRUSH
- SITE CONTOURS
- FLOOD CONTROL BERM
- DEWATERING PAD
- FORMER DREDGE SLURRY PIPE
- RUN-OFF SAMPLE LOCATIONS
- SOIL SAMPLE LOCATION
- APPROXIMATE AREA OF PCB-IMPACTED SOIL

NOTES:
1. DRAWING INFORMATION TAKEN FROM A GOOGLE EARTH PRO AERIAL, DATED 6-1-2015 AND STORMWATER POLLUTION PREVENTION PLAN, PETRO ENVIRONMENTAL, LLC., SEPTEMBER 2004.
2. INCLUDED IN THE REMEDIAL ACTION WORK PLAN, UPPER RIVER - PHASE 1, SEPTEMBER 2004.

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Project
SHEBOYGAN RIVER SUPERFUND SITE

Project Location
TECUMSEH SITE
SHEBOYGAN FALLS, WISCONSIN

Sheet Name
SAMPLE LOCATIONS WITH PCB- IMPACTED SOIL

No.	Revision Date

Date	8-31-18
CADD	JAB
Designer	KE/AJL
Scale	1" = 100'
Project	069638.00.034.001
Figure No.	2

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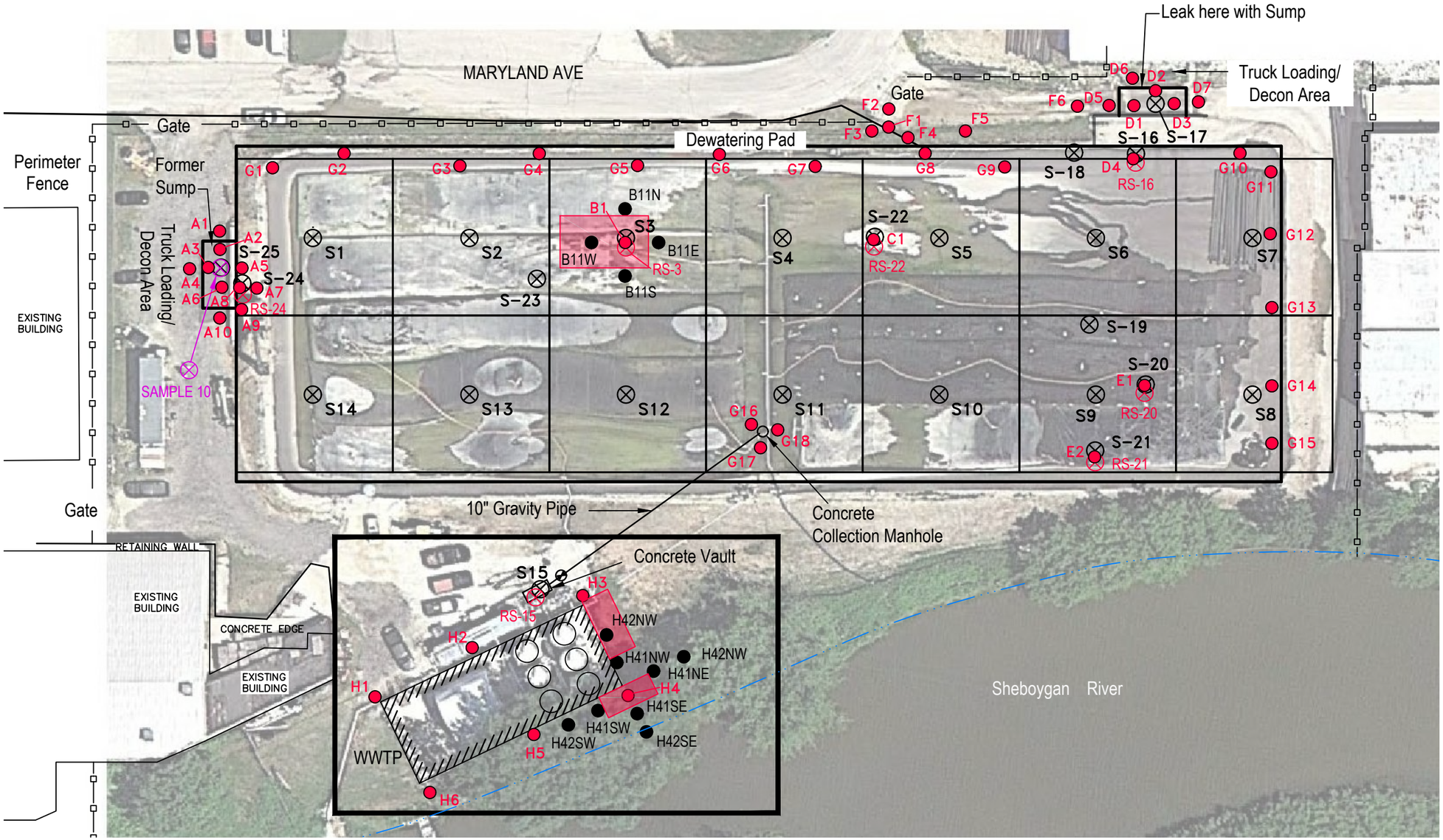

LEGEND

- SAMPLING GRID: 5,000 sq. ft.
- S1 — PREVIOUS ASPHALT SAMPLE LOCATION
- RS3 — PREVIOUS SUB-BASE SAMPLE LOCATION
- PREVIOUS SOIL SAMPLE LOCATION
- ORIGINAL SOIL SAMPLE LOCATION
- STEP OUT SAMPLE LOCATION
- WWTP — WASTEWATER TREATMENT PLANT
- IMPACTED SOIL

NOTE:
DRAWING INFORMATION TAKEN FROM DEWATERING PAD DECOMMISSION DRAWING (DATED NOVEMBER 17, 2010) PREPARED BY POLLUTION RISK SERVICES.

NORTH

0' 50' 100'

GRAPHIC SCALE: 1" = 50'

PLOT DATE: Jul 13, 2017 - 3:20pm - jblake
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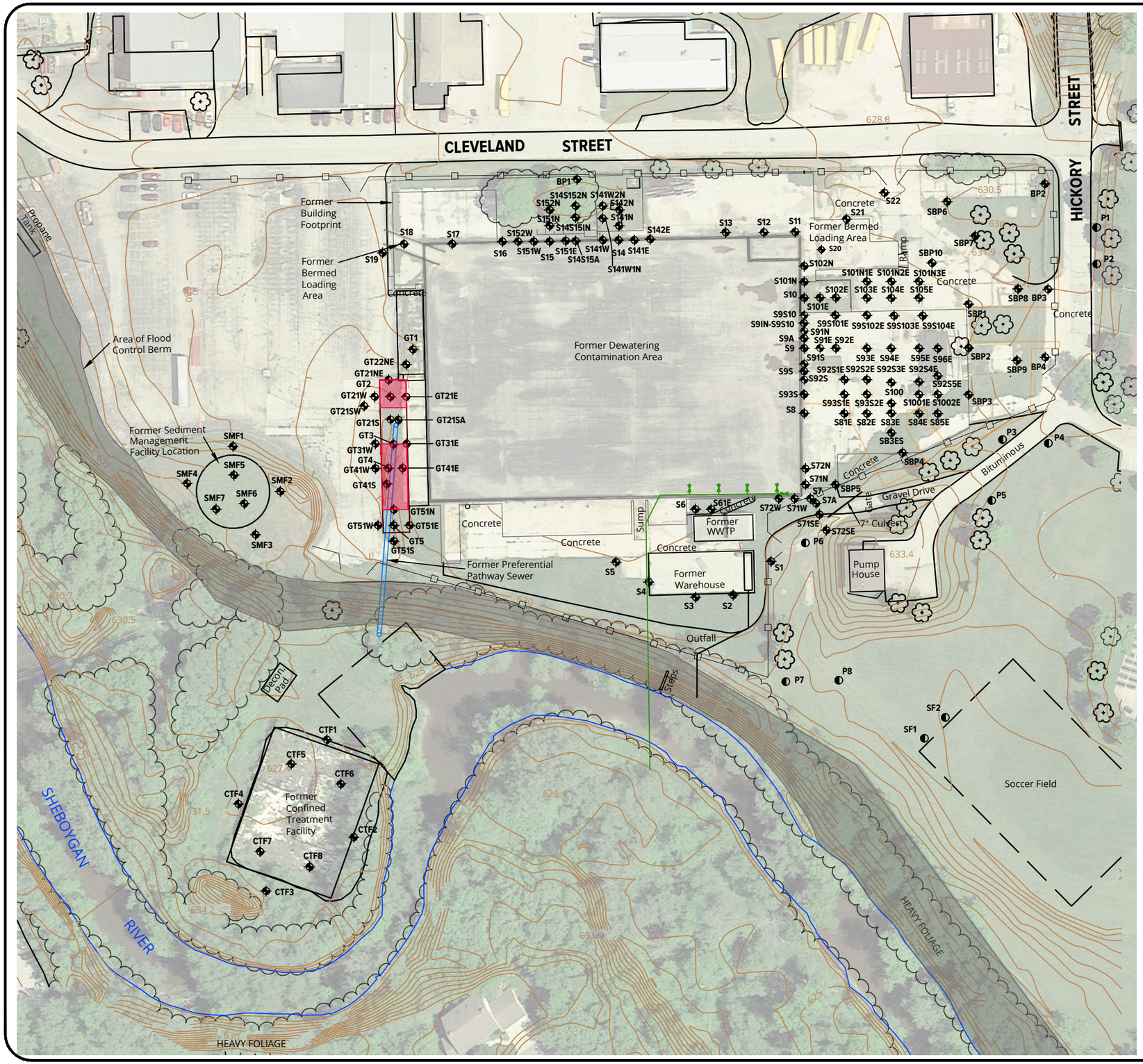
Project
SHEBOYGAN RIVER SUPERFUND SITE

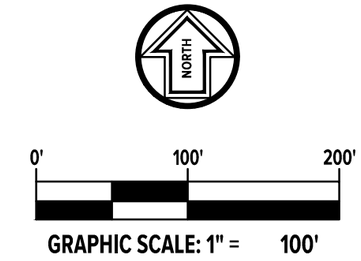
Project Location
SHEBOYGAN, WISCONSIN

Sheet Name
PHASE II SAMPLE LOCATIONS AND EXTENT OF IMPACTED SOIL- MARYLAND AVENUE SITE

No.	Revision Date

Date: 7-1-17
CADD: JAB
Designer: KE
Scale: 1" = 50'
Project: 069638.00.025.001
Figure No.: 3





LEGEND

- EXISTING EDGE OF WATER
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- EXISTING TREE AND/OR BRUSH
- SITE CONTOURS
- FLOOD CONTROL BERM
- DEWATERING PAD
- FORMER DREDGE SLURRY PIPE
- RUN-OFF SAMPLE LOCATIONS
- SOIL SAMPLE LOCATION
- APPROXIMATE AREA OF PAH IMPACTED SOIL. VOLUME IS 244 CUBIC YARDS

NOTES:
1. DRAWING INFORMATION TAKEN FROM A GOOGLE EARTH PRO AERIAL, DATED 6-1-2015 AND STORMWATER POLLUTION PREVENTION PLAN, PETRO ENVIRONMENTAL, LLC., SEPTEMBER 2004.
2. INCLUDED IN THE REMEDIAL ACTION WORK PLAN, UPPER RIVER - PHASE 1, SEPTEMBER 2004.

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Project
SHEBOYGAN RIVER SUPERFUND SITE

Project Location
TECUMSEH SITE
SHEBOYGAN FALLS, WISCONSIN

Sheet Name
SAMPLE LOCATIONS WITH PAH- IMPACTED SOIL

No.	Revision Date

Date	8-31-18
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Designer	KE/AJL
Scale	1" = 100'
Project	069638.00.034.001
Figure No.	4

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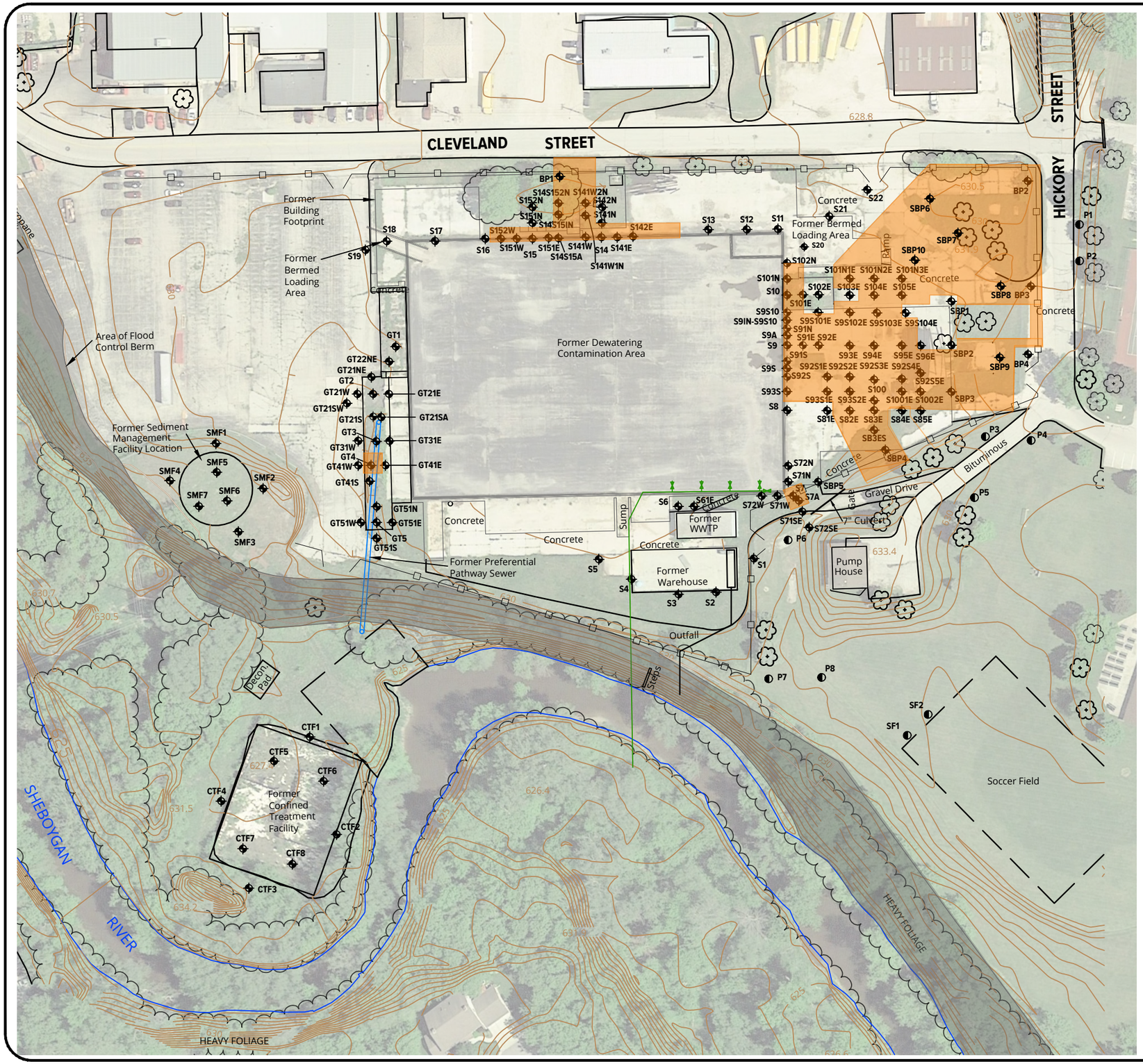

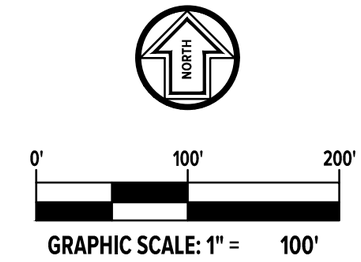

LEGEND

- EXISTING EDGE OF WATER
- EXISTING FENCE
- EXISTING TREE AND/OR BRUSH
- SITE CONTOURS
- FLOOD CONTROL BERM
- DEWATERING PAD
- FORMER DREDGE SLURRY PIPE
- RUN-OFF SAMPLE LOCATIONS
- SOIL SAMPLE LOCATION
- APPROXIMATE AREA OF PCB-IMPACTED SOIL. VOLUME IS 5,448 CUBIC YARDS

NOTES:

1. DRAWING INFORMATION TAKEN FROM A GOOGLE EARTH PRO AERIAL, DATED 6-1-2015 AND STORMWATER POLLUTION PREVENTION PLAN, PETRO ENVIRONMENTAL, LLC., SEPTEMBER 2004.
2. INCLUDED IN THE REMEDIAL ACTION WORK PLAN, UPPER RIVER - PHASE 1, SEPTEMBER 2004.

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Project
SHEBOYGAN RIVER SUPERFUND SITE

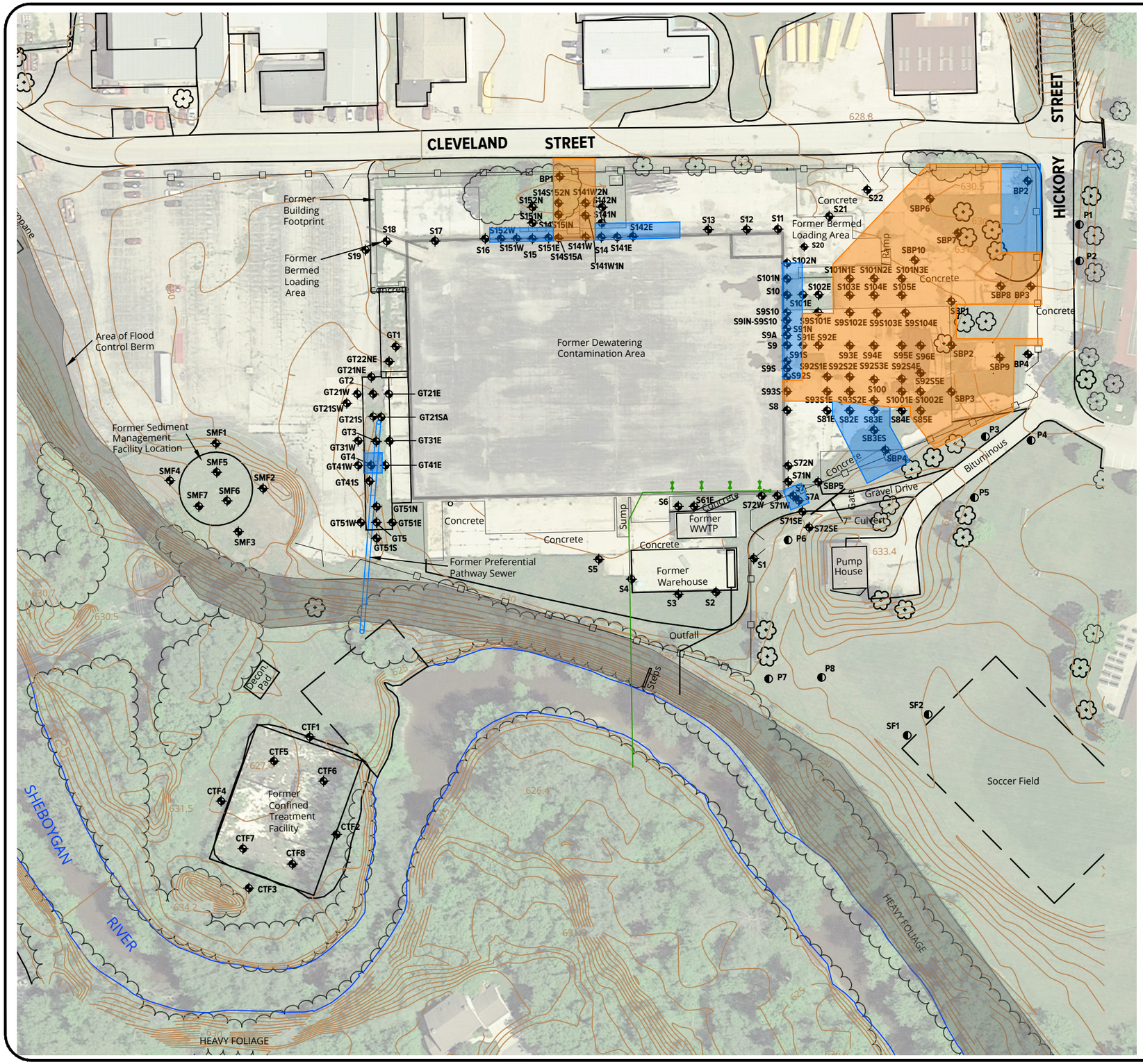
Project Location
TECUMSEH SITE
SHEBOYGAN FALLS, WISCONSIN

Sheet Name
SAMPLE LOCATIONS WITH PCB- IMPACTED SOIL - 0 TO 4 FEET

No.	Revision Date

Date 8-31-18
CADD JAB
Designer KE/AJL
Scale 1" = 100'
Project 069638.00.034.001
Figure No. 5

PLOT DATE: Sep 21, 2018 - 10:02am - jblake FILE LOCATION: \\sme-inc\paz\WIP\069638.00.034.001\rev2\069638.00-03.dwg



NORTH

0' 100' 200'

GRAPHIC SCALE: 1" = 100'

LEGEND

- EXISTING EDGE OF WATER
- EXISTING FENCE
- EXISTING TREE AND/OR BRUSH
- SITE CONTOURS
- FLOOD CONTROL BERM
- DEWATERING PAD
- FORMER DREDGE SLURRY PIPE
- RUN-OFF SAMPLE LOCATIONS
- SOIL SAMPLE LOCATION
- APPROXIMATE AREA OF PCB-IMPACTED SOIL TO 10 FEET BELOW GROUND SURFACE. VOLUME IS 15,525 CUBIC YARDS
- APPROXIMATE AREA OF PCB-IMPACTED SOIL TO A DEPTH OF 4 FEET BELOW GROUND SURFACE. VOLUME IS 1,670 YARDS

NOTES:
1. DRAWING INFORMATION TAKEN FROM A GOOGLE EARTH PRO AERIAL, DATED 6-1-2015 AND STORMWATER POLLUTION PREVENTION PLAN, PETRO ENVIRONMENTAL, LLC., SEPTEMBER 2004.
2. INCLUDED IN THE REMEDIAL ACTION WORK PLAN, UPPER RIVER - PHASE 1, SEPTEMBER 2004.

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Project
SHEBOYGAN RIVER SUPERFUND SITE

Project Location
TECUMSEH SITE
SHEBOYGAN FALLS, WISCONSIN

Sheet Name
SAMPLE LOCATIONS WITH PCB- IMPACTED SOIL - ALL DEPTHS

No.	Revision Date

Date	8-31-18
CADD	JAB
Designer	KE/AJL
Scale	1" = 100'
Project	069638.00.034.001
Figure No.	6

PLOT DATE: Sep 20, 2018 - 2:15pm - jblake FILE LOCATION: \\sme-inc\paz\WIP\069638.00.034.001\rev2\069638.00-03.dwg

TABLES

TABLE 1 – REMEDIAL ALTERNATIVES

TABLE 1
REMEDIAL ALTERNATIVES
Sheboygan River and Harbor Superfund Site
Tecumseh Site
Sheboygan Falls, Ohio

Criterion	Remedial Alternatives						
	Soil Removal	In-Situ Methods					
		Bioremediation	Phytoremediation	Engineering Control	Vitrification	Solvent Extraction	Solidification
Overall Protection of Human Health and the Environment		Not known if reduction would be sufficient to meet standards.	Contamination remains.		Not known if reduction would be sufficient to meet standards.	Not known if reduction would be sufficient to meet standards.	Not known if reduction would be sufficient to meet standards.
Compliance with ARARs			Contamination remains.		Not known if reduction would be sufficient to meet standards.	Not known if reduction would be sufficient to meet standards.	Not known if reduction would be sufficient to meet standards.
Long term effectiveness and permanence (magnitude of residual risk, adequacy and reliability of controls)		Lengthy process.					
Reduction of toxicity, mobility, or volume through treatment (degree of expected reductions, degree to which treatment is irreversible, type and quantity of residuals)			Not known if reduction would be sufficient to meet standards. Plants would contain PCBs and would reqiure removal and disposal at some time.	Contamination is not reduced, but exposure is reduced.		Not known if reduction would be sufficient to meet standards. Plants would contain PCBs and would reqiure removal and disposal at some time.	
Short term effectiveness (protection during remediation, time until objectives are complete, environmental impacts)		Lengthy process.	Lengthy process.		Lengthy process.	Lengthy process.	Lengthy process.
Implementability (space restrictions, reliability, ease, coordination, availibility)					Requires electrical connection and specialized equipment.	Requires electrical connection and specialized equipment.	Requires electrical connection and specialized equipment.
Approximate **Cost** (capital)	>$10,000,000	<$1,000,000	<$1,000,000	<$500,000	>$1,000,000	>$1,000,000	>$1,000,000
Community Acceptance							
State/Support Agency Acceptance				Does not remove the impact.		May not meet standards.	May not meet standards
Screening Score (67.5 possible)	62.5	55	47.5	62.5	47.5	37.5	32.5

Creening Score based on the three criteria shaded brown.

Above Average Performance = 7.5 points
Average Performance = 5 points
Poor Performance = 2.5 points

TABLE 1
REMEDIAL ALTERNATIVES
Sheboygan River and Harbor Superfund Site
Tecumseh Site
Sheboygan Falls, Ohio

Criterion	Remedial Alternatives				
			Ex-Situ Methods		
	Nano-Valent Iron Dechlorination	SPEARS	Chemical Treatment	Vitrification	Biological Treatment
Overall Protection of Human Health and the Environment	Not known if reduction would be sufficient to meet standards.	Not known if reduction would be sufficient to meet standards.	Not known if reduction would be sufficient to meet standards.	Not known if reduction would be sufficient to meet standards.	Not known if reduction would be sufficient to meet standards.
Compliance with ARARs	Not known if reduction would be sufficient to meet standards.	Not known if reduction would be sufficient to meet standards.	Not known if reduction would be sufficient to meet standards.	Not known if reduction would be sufficient to meet standards.	
Long term effectiveness and permanence (magnitude of residual risk, adequacy and reliability of controls)					Lengthy process.
Reduction of toxicity, mobility, or volume through treatment (degree of expected reductions, degree to which treatment is irreversible, type and quantity of residuals)	Not known if reduction would be sufficient to meet standards.	Not known if reduction would be sufficient to meet standards.	Not known if reduction would be sufficient to meet standards. Plants would contain PCBs and would reqiure removal and disposal at some time.		
Short term effectiveness (protection during remediation, time until objectives are complete, environmental impacts)	Lengthy process.	Lengthy process.	Lengthy process.	Lengthy process.	Lengthy process.
Implementability (space restrictions, reliability, ease, coordination, availibility)	Requires electrical connection and specialized equipment.		Requires electrical connection and specialized equipment.	Requires electrical connection and specialized equipment.	
Approximate **Cost** (capital)	>$1,000,000	>$1,000,000	>$1,000,000	>$1,000,000	>$1,000,000
Community Acceptance					
State/Support Agency Acceptance	May not meet standards	May not meet standards	May not meet standards.		
Screening Score (67.5 possible)	37.5	42	37.5	47.5	52.5

Creening Score based on the three criteria shaded brown.

Above Average Performance = 7.5 points
Average Performance = 5 points
Poor Performance = 2.5 points

APPENDIX A
PROUCL DOCUMENTATION

1				**General UCL Statistics for Full Data Sets**								
2			**User Selected Options**									
3			From File	Sheet1.wst								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Number of Bootstrap Operations	2000								
7												
8												
9	**Benzo(a)pyrene**											
10												
11						**General Statistics**							
12						Number of Valid Observations	75				Number of Distinct Observations	70	
13												
14				**Raw Statistics**						**Log-transformed Statistics**		
15						Minimum	0.0013			Minimum of Log Data	-6.645	
16						Maximum	27.7			Maximum of Log Data	3.321	
17						Mean	1.183			Mean of log Data	-2.491	
18						Geometric Mean	0.0828			SD of log Data	2.449	
19						Median	0.0611					
20						SD	4.204					
21						Std. Error of Mean	0.485					
22						Coefficient of Variation	3.552					
23						Skewness	5.508					
24												
25						**Relevant UCL Statistics**							
26				**Normal Distribution Test**						**Lognormal Distribution Test**		
27						Lilliefors Test Statistic	0.389			Lilliefors Test Statistic	0.0739	
28						Lilliefors Critical Value	0.102			Lilliefors Critical Value	0.102	
29				**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**		
30												
31				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
32						95% Student's-t UCL	1.992			95% H-UCL	5.207	
33				**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	4.372	
34						95% Adjusted-CLT UCL (Chen-1995)	2.312			97.5% Chebyshev (MVUE) UCL	5.642	
35						95% Modified-t UCL (Johnson-1978)	2.044			99% Chebyshev (MVUE) UCL	8.137	
36												
37				**Gamma Distribution Test**						**Data Distribution**		
38						k star (bias corrected)	0.263			**Data appear Lognormal at 5% Significance Level**		
39						Theta Star	4.501					
40						MLE of Mean	1.183					
41						MLE of Standard Deviation	2.308					
42						nu star	39.44					
43						Approximate Chi Square Value (.05)	26.05			**Nonparametric Statistics**		
44						Adjusted Level of Significance	0.0468			95% CLT UCL	1.982	
45						Adjusted Chi Square Value	25.84			95% Jackknife UCL	1.992	
46										95% Standard Bootstrap UCL	1.962	
47						Anderson-Darling Test Statistic	4.292			95% Bootstrap-t UCL	4.372	
48						Anderson-Darling 5% Critical Value	0.881			95% Hall's Bootstrap UCL	5.299	
49						Kolmogorov-Smirnov Test Statistic	0.196			95% Percentile Bootstrap UCL	2.144	
50						Kolmogorov-Smirnov 5% Critical Value	0.113			95% BCA Bootstrap UCL	2.447	
51				**Data not Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	3.299	
52										97.5% Chebyshev(Mean, Sd) UCL	4.215	
53				**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	6.014	
54						95% Approximate Gamma UCL (Use when n >= 40)	1.792					

95% Adjusted Gamma UCL (Use when n < 40)	1.806	
Potential UCL to Use		Use 95% H-UCL 5.207

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.

H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.

It is therefore recommended to avoid the use of H-statistic based 95% UCLs.

Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Benzo(a)anthracene

General Statistics

Number of Valid Observations	75	Number of Distinct Observations	71
Number of Missing Values	6		

Raw Statistics		**Log-transformed Statistics**	
Minimum	0.00165	Minimum of Log Data	-6.407
Maximum	29.2	Maximum of Log Data	3.374
Mean	1.232	Mean of log Data	-2.58
Geometric Mean	0.0758	SD of log Data	2.445
Median	0.0398		
SD	4.464		
Std. Error of Mean	0.515		
Coefficient of Variation	3.624		
Skewness	5.553		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.391	Lilliefors Test Statistic	0.11
Lilliefors Critical Value	0.102	Lilliefors Critical Value	0.102
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	2.09	95% H-UCL	4.701
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	3.958
95% Adjusted-CLT UCL (Chen-1995)	2.433	97.5% Chebyshev (MVUE) UCL	5.107
95% Modified-t UCL (Johnson-1978)	2.145	99% Chebyshev (MVUE) UCL	7.363
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.253	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	4.872		
MLE of Mean	1.232		
MLE of Standard Deviation	2.45		
nu star	37.92		
Approximate Chi Square Value (.05)	24.82	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0468	95% CLT UCL	2.079
Adjusted Chi Square Value	24.61	95% Jackknife UCL	2.09
		95% Standard Bootstrap UCL	2.097
Anderson-Darling Test Statistic	5.13	95% Bootstrap-t UCL	4.89

109				Anderson-Darling 5% Critical Value	0.886					95% Hall's Bootstrap UCL	5.827	
110				Kolmogorov-Smirnov Test Statistic	0.215					95% Percentile Bootstrap UCL	2.147	
111				Kolmogorov-Smirnov 5% Critical Value	0.113					95% BCA Bootstrap UCL	2.56	
112				**Data not Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	3.478	
113										97.5% Chebyshev(Mean, Sd) UCL	4.45	
114				**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	6.36	
115				95% Approximate Gamma UCL (Use when n >= 40)	1.882							
116				95% Adjusted Gamma UCL (Use when n < 40)	1.898							
117												
118				**Potential UCL to Use**						Use 95% Chebyshev (Mean, Sd) UCL	3.478	
119												
120	**Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.**											
121	**These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)**											
122	**and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.**											
123												
124												
125	**Benzo(b)fluoranthene**											
126												
127				**General Statistics**								
128				Number of Valid Observations	75					Number of Distinct Observations	73	
129												
130				**Raw Statistics**						**Log-transformed Statistics**		
131				Minimum	0.00145					Minimum of Log Data	-6.536	
132				Maximum	38.2					Maximum of Log Data	3.643	
133				Mean	1.645					Mean of log Data	-2.157	
134				Geometric Mean	0.116					SD of log Data	2.479	
135				Median	0.0887							
136				SD	5.812							
137				Std. Error of Mean	0.671							
138				Coefficient of Variation	3.532							
139				Skewness	5.545							
140												
141				**Relevant UCL Statistics**								
142				**Normal Distribution Test**						**Lognormal Distribution Test**		
143				Lilliefors Test Statistic	0.389					Lilliefors Test Statistic	0.0772	
144				Lilliefors Critical Value	0.102					Lilliefors Critical Value	0.102	
145				**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**		
146												
147				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
148				95% Student's-t UCL	2.763					95% H-UCL	8.039	
149				**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	6.611	
150				95% Adjusted-CLT UCL (Chen-1995)	3.208					97.5% Chebyshev (MVUE) UCL	8.542	
151				95% Modified-t UCL (Johnson-1978)	2.835					99% Chebyshev (MVUE) UCL	12.33	
152												
153				**Gamma Distribution Test**						**Data Distribution**		
154				k star (bias corrected)	0.263					**Data appear Lognormal at 5% Significance Level**		
155				Theta Star	6.249							
156				MLE of Mean	1.645							
157				MLE of Standard Deviation	3.207							
158				nu star	39.5							
159				Approximate Chi Square Value (.05)	26.1					**Nonparametric Statistics**		
160				Adjusted Level of Significance	0.0468					95% CLT UCL	2.749	
161				Adjusted Chi Square Value	25.89					95% Jackknife UCL	2.763	
162										95% Standard Bootstrap UCL	2.736	

163				Anderson-Darling Test Statistic	4.059					95% Bootstrap-t UCL	5.841
164				Anderson-Darling 5% Critical Value	0.881					95% Hall's Bootstrap UCL	7.705
165				Kolmogorov-Smirnov Test Statistic	0.199					95% Percentile Bootstrap UCL	2.912
166				Kolmogorov-Smirnov 5% Critical Value	0.113					95% BCA Bootstrap UCL	3.297
167				**Data not Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	4.571
168										97.5% Chebyshev(Mean, Sd) UCL	5.836
169				**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	8.323
170				95% Approximate Gamma UCL (Use when n >= 40)	2.49						
171				95% Adjusted Gamma UCL (Use when n < 40)	2.511						
172											
173				**Potential UCL to Use**						Use 95% H-UCL	8.039
174											
175				**ProUCL computes and outputs H-statistic based UCLs for historical reasons only.**							
176				**H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.**							
177				**It is therefore recommended to avoid the use of H-statistic based 95% UCLs.**							
178				**Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.**							
179											
180				**Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.**							
181				**These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)**							
182				**and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.**							
183											
184											
185	**Lead**										
186											
187				**General Statistics**							
188				Number of Valid Observations	65					Number of Distinct Observations	54
189				Number of Missing Values	10						
190											
191				**Raw Statistics**						**Log-transformed Statistics**	
192				Minimum	1.3					Minimum of Log Data	0.262
193				Maximum	1530					Maximum of Log Data	7.333
194				Mean	69.59					Mean of log Data	2.795
195				Geometric Mean	16.37					SD of log Data	1.729
196				Median	13.8						
197				SD	194.9						
198				Std. Error of Mean	24.17						
199				Coefficient of Variation	2.801						
200				Skewness	6.801						
201											
202				**Relevant UCL Statistics**							
203				**Normal Distribution Test**						**Lognormal Distribution Test**	
204				Lilliefors Test Statistic	0.363					Lilliefors Test Statistic	0.13
205				Lilliefors Critical Value	0.11					Lilliefors Critical Value	0.11
206				**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**	
207											
208				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
209				95% Student's-t UCL	109.9					95% H-UCL	130.9
210				**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	161.6
211				95% Adjusted-CLT UCL (Chen-1995)	131.1					97.5% Chebyshev (MVUE) UCL	201.6
212				95% Modified-t UCL (Johnson-1978)	113.3					99% Chebyshev (MVUE) UCL	280.1
213											
214				**Gamma Distribution Test**						**Data Distribution**	
215				k star (bias corrected)	0.436					**Data do not follow a Discernable Distribution (0.05)**	
216				Theta Star	159.5						

MLE of Mean	69.59	
MLE of Standard Deviation	105.4	
nu star	56.72	
Approximate Chi Square Value (.05)	40.41	**Nonparametric Statistics**
Adjusted Level of Significance	0.0463	95% CLT UCL 109.4
Adjusted Chi Square Value	40.1	95% Jackknife UCL 109.9
		95% Standard Bootstrap UCL 108.6
Anderson-Darling Test Statistic	2.458	95% Bootstrap-t UCL 178.1
Anderson-Darling 5% Critical Value	0.829	95% Hall's Bootstrap UCL 257.4
Kolmogorov-Smirnov Test Statistic	0.155	95% Percentile Bootstrap UCL 112.7
Kolmogorov-Smirnov 5% Critical Value	0.118	95% BCA Bootstrap UCL 144.8
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL 175
		97.5% Chebyshev(Mean, Sd) UCL 220.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL 310.1
95% Approximate Gamma UCL (Use when n >= 40)	97.68	
95% Adjusted Gamma UCL (Use when n < 40)	98.44	
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL 175

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

APPENDIX B
REMEDIAL ALTERNATIVES SCORING SHEET

DETAILED ANALYSIS SCORING SHEET

ALTERNATIVE 1 – *SOIL REMOVAL*

SUMMARY OF SCORING

ALTERNATIVE 1

AREA	SCORE
Compliance with ARARs, Criteria 7 Guidelines	10
Protection of Human Health and the Environment	20
Short-term Effectiveness	9
Long-term Effectiveness and Performance	12
Reduction of Toxicity, Mobility, Volume	17
Implementability	13
Cost (0-10, "10" is most economical)	0
TOTAL...	**81**

Analysis Factor	Basis for Evaluation During Detailed Analysis	Applicability				
COMPLIANCE WITH ARARs, STANDARDS, CRITERIA, AND GUIDELINES		**YES**		**NO**		**Score**
1. Chemical-specific ARARs	i) Meets chemical specific ARARs such as groundwater standards.	X	4	0	=	4
2. Action-specific ARARs	ii) Meets ARARs such as technology standards for incineration or landfill.	X	3	0	=	3
3. Location-specific ARARs	iii) Meets location-specific ARARs such as Freshwater Wetlands Act.	X	3	0	=	3
Note: ARARs - Applicable or Relevant and Appropriate Requirements		**TOTAL (maximum = 10)**			=	**10**
PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT		**YES**		**NO**		**Score**
1. Use of Site after remediation.	i) Unrestricted use of land and water. (If yes, go to end of the Table)	X	20	0	=	20
	ii) Future redevelopment of land and water constrained		0	10		0
		Sub-Total (maximum = 20)			=	20
2. Human health and environment exposure after the remediation	i) Is the exposure to contaminants via route acceptable?		3	0	=	0
	ii) Is the exposure to contaminants via ground/surface water acceptable?		4	0	=	0
	iii) Is the exposure to contaminants via sediments/soils acceptable?		3	0	=	0
		Sub-Total (maximum = 10)			=	0
3. Magnitude of residual public health risks after remediation.	i) Health risk **≤ 1 in 1,000,000**		5	0	=	0
	ii) Health risk **≤ 1 in 100,000**		2	0	=	0
		Sub-Total (maximum = 5)			=	0
4. Magnitude of residual environ-mental risks after remediation.	i) Less than acceptable	0	5	0	=	0
	ii) Slightly greater than acceptable		3	0	=	0
	iii) Significant risk still exists		0	0	=	0
		Sub-Total (maximum = 5)			=	0
		TOTAL (maximum = 40)			=	**20**
SHORT-TERM EFFECTIVENESS		**YES**		**NO**		**Score**
1. Protection of community during remedial actions.	i) Are there significant short-term risks to community that must be addressed? (if no, go to 2)		0	X 4	=	4
	ii) Can the risk be easily controlled?		1	0	=	0
	iii) Does the mitigative effort to control risk impact community life-style?		0	X 2	=	0
		Sub-Total (maximum = 4)			=	4
2. Environmental Impacts	i) Are there short-term risks to environment that must be addressed (if no, go to 3)		0	X 4	=	4
	ii) Are there significant mitigative measures reliable to minimize potential impacts		3	0	=	0
		Sub-Total (maximum = 4)			=	4
3. Time to implement the remedy	i) Is the required time to implement the remedy ≤ 2 yrs?	X	1	0	=	1
	ii) Required duration of the mitigative effort to control short-term risk ≤ 2 yrs?		1	X 0	=	0
		Sub-Total (maximum = 2)			=	1
		TOTAL (maximum = 10)			=	**9**

Analysis Factor	Basis for Evaluation During Detailed Analysis		Applicability					
LONG-TERM EFFECTIVENESS AND PERFORMANCE			**YES**		**NO**			**Score**
1. On-site or off-site treatment or land disposal.	i) On-site treatment	Note: treatment is defined as destruction,		3	X	0	=	0
	ii) Off-site treatment	separation/treatment, or solidification/		1	X	0	=	0
	iii) On-site or Off-site land disposal	chemical fixation.	X	0		0	=	0
					Sub-Total (maximum = 3)		=	0
2. Permanence of the remedial alternative	i) Will the remedy be classified as permanent. (if yes, go to 4)		X	3		0	=	3
					Sub-Total (maximum = 3)		=	3
3. Lifetime of remedial actions	i) Expected lifetime or duration of effectiveness of the remedy	25-30 yr		3		0	=	0
		20-25 yr		2		0	=	0
		15-20 yr		1		0	=	0
		<15 yr		0		0	=	0
					Sub-Total (maximum = 3)		=	0
4. Quantity and nature of waste or residual left at the site after remediation.	i) Quantity of untreated hazardous and/or petroleum waste left at site.	None	X	3		0	=	3
		≤25%		2		0	=	0
		25-50%		1		0	=	0
		≥50%		0		0	=	0
	ii) Is there untreated residual left at site? (if no, go to 5)			0	X	2	=	2
	iii) Is the untreated residual toxic?		X	0		1	=	0
	iv) Is the untreated residual mobile?			0	X	1	=	1
					Sub-Total (maximum = 5)		=	6
5. Adequacy and reliability of controls.	i) Operation and maintenance required for a period of < 5 yrs?			1	X	0	=	0
	ii) Are environmental controls req'd as part of the remedy to handle potential problems?			0	X	1	=	1
	iii) Degree of confidence that controls can handle potential problems?	Moderate to very		1		0	=	0
		Somewhat to not		0		0	=	0
	iv) Relative degree of long-term monitoring required	(minimum)	X	2		0	=	2
		(moderate)		1		0	=	0
		(extensive)		0		0	=	0
					Sub-Total (maximum = 4)		=	3
						TOTAL (maximum = 18)	=	**12**

Analysis Factor	Basis for Evaluation During Detailed Analysis		Applicability YES		Applicability NO		Score
REDUCTION OF TOXICITY, MOBILITY, VOLUME							
1. Volume of hazardous and/or petroleum waste reduced (reduction in volume or toxicity).	i) Quantity of hazardous and/or petroleum waste destroyed or treated	99-100%	X 8		0	=	8
		90-99%	7		0	=	0
	Immobilization technologies do not score under this Factor	80-90%	6		0	=	0
		60-80%	4		0	=	0
If not applicable, go to next Factor.		40-60%	2		0	=	0
		20-40%	1		0	=	0
		<20%	0		0	=	0
If no, go to next Factor.	ii) Are there untreated or concentrated wastes produced as a result of (i)?		0	X	2	=	2
	iii) After remediation, how is the untreated, residual waste material disposed?						
		offsite land disposal	X 0		0	=	0
		onsite land disposal	1		0	=	0
		offsite destruction or treatment	2		0	=	0
	If sub-total = 10, go to Factor 3.	**Sub-Total (maximum = 10)**				=	10
2. Reduction in mobility of hazardous or petroleum waste.	i) Quantity of Available Wastes Immobilized After Destruction/ Treatment						
		90-100%	X 2		0	=	2
		60-90%	1		0	=	0
If not applicable, go to next Factor .		<60%	0		0	=	0
	ii) Method of Immobilization						
	- Reduced mobility by containment.		X 0		0	=	0
	- Reduced mobility by alternative treatment technologies.*		3		0	=	0
	* - air stripping, natural attenuation (*i.e.*, physiochemical attraction, biodegradation)		0		1	=	0
		Sub-Total (maximum = 5)				=	2
3. Irreversibility of the destruction or treatment or immobilization of hazardous and/or petroleum waste.	- Completely irreversible.		X 5		0	=	5
	- Irreversible for most of the waste constituents.		3		0	=	0
	- Irreversible for only some of the waste constituents.		2		0	=	0
	- Reversible for most of the waste constituents.		0		0	=	0
		Sub-Total (maximum = 5)				=	5
		TOTAL (maximum = 20)				=	**17**

Analysis Factor	Basis for Evaluation During Detailed Analysis	Applicability				
IMPLEMENTABILITY		**YES**		**NO**		**Score**
1. Technical Feasibility						
	i) Ability to construct technology					
	Not difficult to construct. No uncertainties in construction.	X	3	0	=	3
	Somewhat difficult to construct. No uncertainties in construction.		2	0	=	0
	Very difficult to construct and/or significant uncertainties in construction.		1	0	=	0
	ii) Reliability of technology					
	Very reliable in meeting the specified process efficiencies or performance goals.	X	3	0	=	3
	Somewhat reliable in meeting the specified process efficiencies or performance goals.		2	0	=	0
	iii) Schedule of delays due to technical problems.					
	Unlikely	X	2	0	=	2
	Somewhat unlikely		1	0	=	0
	iv) Need of undertaking additional remedial action, if necessary.					
	No future remedial actions may be anticipated.	X	2	0	=	2
	Some future remedial actions may be necessary.		1	0	=	0
	Sub-Total (maximum = 10)				=	10
2. Administrative Feasibility						
	i) Coordination with other agencies					
	Minimal coordination is required.		2	0	=	0
	Required coordination is normal.		1	0	=	0
	Extensive coordination is required.	X	0	0	=	0
	Sub-Total (maximum = 2)				=	0
3. Availability of Services and Materials						
a. Availability of prospective technologies.	i) Are selected technologies commercially available for the site-specific application?	X	1	0	=	1
	ii) Will more than one vendor be available to provide a competitive bid?	X	1	0	=	1
b. Availability of necessary equipment and specialists.	i) Additional equipment and specialists may be available without significant delay.	X	1	0	=	1
	Sub-Total (maximum = 3)				=	3
	TOTAL (maximum = 15)				=	**13**

DETAILED ANALYSIS SCORING SHEET

ALTERNATIVE 2 – *ENGINEERING CONTROL*

SUMMARY OF SCORING

ALTERNATIVE 2

AREA	SCORE
Compliance with ARARs, Criteria 7 Guidelines	10
Protection of Human Health and the Environment	25
Short-term Effectiveness	9
Long-term Effectiveness and Performance	7
Reduction of Toxicity, Mobility, Volume	5
Implementability	15
Cost (0-10, "10" is most economical)	10
TOTAL...	**81**

Analysis Factor	Basis for Evaluation During Detailed Analysis	Applicability						
COMPLIANCE WITH ARARs, STANDARDS, CRITERIA, AND GUIDELINES		**YES**		**NO**			**Score**	
1. Chemical-specific ARARs	i) Meets chemical specific ARARs such as groundwater standards.	X	4		0	=	4	
2. Action-specific ARARs	ii) Meets ARARs such as technology standards for incineration or landfill.	X	3		0	=	0	
3. Location-specific ARARs	iii) Meets location-specific ARARs such as Freshwater Wetlands Act.	X	3		0	=	3	
Note: ARARs - Applicable or Relevant and Appropriate Requirements		**TOTAL (maximum = 10)**				=	**10**	
PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT		**YES**		**NO**			**Score**	
1. Use of Site after remediation.	i) Unrestricted use of land and water. (If yes, go to end of the Table)		20		0	=	0	
	ii) Future redevelopment of land and water constrained		0	X	10		10	
		Sub-Total (maximum = 20)				=	10	
2. Human health and environment exposure after the remediation	i) Is the exposure to contaminants via route acceptable?	X	3		0	=	3	
	ii) Is the exposure to contaminants via ground/surface water acceptable?	X	4		0	=	4	
	iii) Is the exposure to contaminants via sediments/soils acceptable?	X	3		0	=	3	
		Sub-Total (maximum = 10)				=	10	
3. Magnitude of residual public health risks after remediation.	i) Health risk **≤ 1 in 1,000,000**	X	5		0	=	5	
	ii) Health risk **≤ 1 in 100,000**		2		0	=	0	
		Sub-Total (maximum = 5)				=	5	
4. Magnitude of residual environ-mental risks after remediation.	i) Less than acceptable		5		0	=	0	
	ii) Slightly greater than acceptable		3		0	=	0	
	iii) Significant risk still exists	X	0		0	=	0	
		Sub-Total (maximum = 5)				=	0	
		TOTAL (maximum = 40)				=	**25**	
SHORT-TERM EFFECTIVENESS		**YES**		**NO**			**Score**	
1. Protection of community during remedial actions.	i) Are there significant short-term risks to community that must be addressed? (if no, go to 2)		0	X	4	=	4	
	ii) Can the risk be easily controlled?		1		0	=	0	
	iii) Does the mitigative effort to control risk impact community life-style?		0		2	=	0	
		Sub-Total (maximum = 4)				=	4	
2. Environmental Impacts	i) Are there short-term risks to environment that must be addressed (if no, go to 3)		0	X	4	=	4	
	ii) Are there significant mitigative measures reliable to minimize potential impacts		3		0	=	0	
		Sub-Total (maximum = 4)				=	4	
3. Time to implement the remedy	i) Is the required time to implement the remedy ≤ 2 yrs?	X	1		0	=	1	
	ii) Required duration of the mitigative effort to control short-term risk ≤ 2 yrs?	0	1		0	=	0	
		Sub-Total (maximum = 2)				=	1	
		TOTAL (maximum = 10)				=	**9**	

Analysis Factor	Basis for Evaluation During Detailed Analysis		Applicability					
LONG-TERM EFFECTIVENESS AND PERFORMANCE			**YES**		**NO**			**Score**
1. On-site or off-site treatment or land disposal.	i) On-site treatment	Note: treatment is defined as destruction,		3	X	0	=	0
	ii) Off-site treatment	separation/treatment, or solidification/		1	X	0	=	0
	iii) On-site or Off-site land disposal	chemical fixation.	X	0		0	=	0
				Sub-Total (maximum = 3)			=	0
2. Permanence of the remedial alternative	i) Will the remedy be classified as permanent. (if yes, go to 4)		X	3		0	=	3
				Sub-Total (maximum = 3)			=	3
3. Lifetime of remedial actions	i) Expected lifetime or duration of effectiveness of the remedy	25-30 yr		3		0	=	0
		20-25 yr		2		0	=	0
		15-20 yr		1		0	=	0
		<15 yr		0		0	=	0
				Sub-Total (maximum = 3)			=	0
4. Quantity and nature of waste or residual left at the site after remediation.	i) Quantity of untreated hazardous and/or petroleum waste left at site.	None		3		0	=	0
		≤25%		2		0	=	0
		25-50%		1		0	=	0
		≥50%		0	X	0	=	0
	ii) Is there untreated residual left at site? (if no, go to 5)		X	0		2	=	0
	iii) Is the untreated residual toxic?		X	0		1	=	0
	iv) Is the untreated residual mobile?			0	X	1	=	1
				Sub-Total (maximum = 5)			=	1
5. Adequacy and reliability of controls.	i) Operation and maintenance required for a period of < 5 yrs?			1	X	0	=	0
	ii) Are environmental controls req'd as part of the remedy to handle potential problems?		X	0		1	=	0
	iii) Degree of confidence that controls can handle potential problems?	Moderate to very	X	1		0	=	1
		Somewhat to not	X	0		0	=	0
	iv) Relative degree of long-term monitoring required	(minimum)	X	2		0	=	2
		(moderate)		1		0	=	0
		(extensive)		0		0	=	0
				Sub-Total (maximum = 4)			=	3
				TOTAL (maximum = 18)			=	**7**

Analysis Factor	Basis for Evaluation During Detailed Analysis		Applicability					Score
REDUCTION OF TOXICITY, MOBILITY, VOLUME			**YES**		**NO**			
1. Volume of hazardous and/or petroleum waste reduced (reduction in volume or toxicity).	i) Quantity of hazardous and/or petroleum waste destroyed or treated	99-100%	8	X	0	=	0
		90-99%	7	X	0	=	0
	Immobilization technologies do not score under this Factor	80-90%	6	X	0	=	0
		60-80%	4	X	0	=	0
If not applicable, go to next Factor.		40-60%	2	X	0	=	0
		20-40%	1	X	0	=	0
		<20%	0		0	=	0
If no, go to next Factor.	ii) Are there untreated or concentrated wastes produced as a result of (i)?		0	X	2	=	2
	iii) After remediation, how is the untreated, residual waste material disposed?						
		offsite land disposal	0		0	=	0
		onsite land disposal	X 1		0	=	1
		offsite destruction or treatment	2		0	=	0
	If sub-total = 10, go to Factor 3.	**Sub-Total (maximum = 10)**				=	3
2. Reduction in mobility of hazardous or petroleum waste.	i) Quantity of Available Wastes Immobilized After Destruction/ Treatment						
		90-100%	X 2		0	=	2
		60-90%	1		0	=	0
If not applicable, go to next Factor .		<60%	0		0	=	0
	ii) Method of Immobilization						
	- Reduced mobility by containment.		X 0		0	=	0
	- Reduced mobility by alternative treatment technologies.*		3		0	=	0
	* - air stripping, natural attenuation (*i.e.*, physiochemical attraction, biodegradation)						
		Sub-Total (maximum = 5)				=	2
3. Irreversibility of the destruction or treatment or immobilization of hazardous and/or petroleum waste.	- Completely irreversible.		5		0	=	0
	- Irreversible for most of the waste constituents.		3		0	=	0
	- Irreversible for only some of the waste constituents.		2		0	=	0
	- Reversible for most of the waste constituents.		0		0	=	0
		Sub-Total (maximum = 5)				=	0
		TOTAL (maximum = 20)				=	**5**

Analysis Factor	Basis for Evaluation During Detailed Analysis	Applicability				
IMPLEMENTABILITY		**YES**		**NO**		**Score**
1. Technical Feasibility						
	i) Ability to construct technology					
	Not difficult to construct. No uncertainties in construction.	X	3	0	=	3
	Somewhat difficult to construct. No uncertainties in construction.		2	0	=	0
	Very difficult to construct and/or significant uncertainties in construction.		1	0	=	0
	ii) Reliability of technology					
	Very reliable in meeting the specified process efficiencies or performance goals.	X	3	0	=	3
	Somewhat reliable in meeting the specified process efficiencies or performance goals.		2	0	=	0
	iii) Schedule of delays due to technical problems.					
	Unlikely	X	2	0	=	2
	Somewhat unlikely		1	0	=	0
	iv) Need of undertaking additional remedial action, if necessary.					
	No future remedial actions may be anticipated.	X	2	0	=	2
	Some future remedial actions may be necessary.		1	0	=	0
	Sub-Total (maximum = 10)				=	10
2. Administrative Feasibility						
	i) Coordination with other agencies					
	Minimal coordination is required.	X	2	0	=	2
	Required coordination is normal.		1	0	=	0
	Extensive coordination is required.		0	0	=	0
	Sub-Total (maximum = 2)				=	2
3. Availability of Services and Materials						
a. Availability of prospective technologies.	i) Are selected technologies commercially available for the site-specific application?	X	1	0	=	1
	ii) Will more than one vendor be available to provide a competitive bid?	X	1	0	=	1
b. Availability of necessary equipment and specialists.	i) Additional equipment and specialists may be available without significant delay.	X	1	0	=	1
	Sub-Total (maximum = 3)				=	3
	TOTAL (maximum = 15)				=	**15**

DETAILED ANALYSIS SCORING SHEET

ALTERNATIVE 3 – *IN-SITU BIOREMEDIATION*

SUMMARY OF SCORING

ALTERNATIVE 3

AREA	SCORE
Compliance with ARARs, Criteria 7 Guidelines	7
Protection of Human Health and the Environment	20
Short-term Effectiveness	8
Long-term Effectiveness and Performance	13
Reduction of Toxicity, Mobility, Volume	19
Implementability	9
Cost (0-10, "10" is most economical)	5
TOTAL...	**80**

Analysis Factor	Basis for Evaluation During Detailed Analysis	Applicability						
COMPLIANCE WITH ARARs, STANDARDS, CRITERIA, AND GUIDELINES		**YES**		**NO**			**Score**	
1. Chemical-specific ARARs	i) Meets chemical specific ARARs such as groundwater standards.	X	4		0	=	4	
2. Action-specific ARARs	ii) Meets ARARs such as technology standards for incineration or landfill.		3	X	0	=	0	
3. Location-specific ARARs	iii) Meets location-specific ARARs such as Freshwater Wetlands Act.	X	3		0	=	3	
Note: ARARs - Applicable or Relevant and Appropriate Requirements		**TOTAL (maximum = 10)**				=	**7**	
PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT		**YES**		**NO**			**Score**	
1. Use of Site after remediation.	i) Unrestricted use of land and water. (If yes, go to end of the Table)	X	20		0	=	20	
	ii) Future redevelopment of land and water constrained		0		10		0	
		Sub-Total (maximum = 20)				=	20	
2. Human health and environment exposure after the remediation	i) Is the exposure to contaminants via route acceptable?		3		0	=	0	
	ii) Is the exposure to contaminants via ground/surface water acceptable?		4		0	=	0	
	iii) Is the exposure to contaminants via sediments/soils acceptable?		3		0	=	0	
		Sub-Total (maximum = 10)				=	0	
3. Magnitude of residual public health risks after remediation.	i) Health risk **≤ 1 in 1,000,000**		5		0	=	0	
	ii) Health risk **≤ 1 in 100,000**		2		0	=	0	
		Sub-Total (maximum = 5)				=	0	
4. Magnitude of residual environ-mental risks after remediation.	i) Less than acceptable		5		0	=	0	
	ii) Slightly greater than acceptable		3		0	=	0	
	iii) Significant risk still exists	X	0		0	=	0	
		Sub-Total (maximum = 5)				=	0	
		TOTAL (maximum = 40)				=	**20**	
SHORT-TERM EFFECTIVENESS		**YES**		**NO**			**Score**	
1. Protection of community during remedial actions.	i) Are there significant short-term risks to community that must be addressed? (If no, go to 2)		0	X	4	=	4	
	ii) Can the risk be easily controlled?		1		0	=	0	
	iii) Does the mitigative effort to control risk impact community life-style?		0		2	=	0	
		Sub-Total (maximum = 4)				=	4	
2. Environmental Impacts	i) Are there short-term risks to environment that must be addressed (if no, go to 3)		0	X	4	=	4	
	ii) Are there significant mitigative measures reliable to minimize potential impacts		3		0	=	0	
		Sub-Total (maximum = 4)				=	4	
3. Time to implement the remedy	i) Is the required time to implement the remedy ≤ 2 yrs?		1	X	0	=	0	
	ii) Required duration of the mitigative effort to control short-term risk ≤ 2 yrs?		1	X	0	=	0	
		Sub-Total (maximum = 2)				=	0	
		TOTAL (maximum = 10)				=	**8**	

Analysis Factor	Basis for Evaluation During Detailed Analysis		Applicability YES		Applicability NO			Score
LONG-TERM EFFECTIVENESS AND PERFORMANCE								
1. On-site or off-site treatment or land disposal.	i) On-site treatment	Note: treatment is defined as destruction,	X	3		0	=	3
	ii) Off-site treatment	separation/treatment, or solidification/		1	X	0	=	0
	iii) On-site or Off-site land disposal	chemical fixation.	X	0		0	=	0
				Sub-Total (maximum = 3)			=	3
2. Permanence of the remedial alternative	i) Will the remedy be classified as permanent. (If yes, go to 4)		X	3		0	=	3
				Sub-Total (maximum = 3)			=	3
3. Lifetime of remedial actions	i) Expected lifetime or duration of effectiveness of the remedy	25-30 yr	X	3		0	=	3
		20-25 yr		2		0	=	0
		15-20 yr		1		0	=	0
		<15 yr		0		0	=	0
				Sub-Total (maximum = 3)			=	3
4. Quantity and nature of waste or residual left at the site after remediation.	i) Quantity of untreated hazardous and/or petroleum waste left at site.	None	x	3		0	=	3
		≤25%		2		0	=	0
		25-50%		1		0	=	0
		≥50%	X	0		0	=	0
	ii) Is there untreated residual left at site? (If no, go to 5)		X	0		2	=	0
	iii) Is the untreated residual toxic?		X	0		1	=	0
	iv) Is the untreated residual mobile?		X	0		1	=	0
				Sub-Total (maximum = 5)			=	3
5. Adequacy and reliability of controls.	i) Operation and maintenance required for a period of < 5 yrs?			1	X	0	=	0
	ii) Are environmental controls req'd as part of the remedy to handle potential problems?			0	X	1	=	1
	iii) Degree of confidence that controls can handle potential problems?	Moderate to very		1		0	=	1
		Somewhat to not		0		0	=	0
	iv) Relative degree of long-term monitoring required	(minimum)		2		0	=	0
		(moderate)	X	1		0	=	1
		(extensive)		0		0	=	0
				Sub-Total (maximum = 4)			=	1
				TOTAL (maximum = 18)			=	**13**

Analysis Factor	Basis for Evaluation During Detailed Analysis		Applicability			
REDUCTION OF TOXICITY, MOBILITY, VOLUME			**YES**	**NO**		**Score**
1. Volume of hazardous and/or petroleum waste reduced (reduction in volume or toxicity).	i) Quantity of hazardous and/or petroleum waste destroyed or treated	99-100%	8	0	=	0
		90-99%	7	0	=	0
	Immobilization technologies do not score under this Factor	80-90% X	6	0	=	6
		60-80%	4	0	=	0
If not applicable, go to next Factor.		40-60%	2	0	=	0
		20-40%	1	0	=	0
		<20%	0	0	=	0
If no, go to next Factor.	ii) Are there untreated or concentrated wastes produced as a result of (i)?		0	X 2	=	2
	iii) After remediation, how is the untreated, residual waste material disposed?					
	off-site land disposal		0	0	=	0
	on-site land disposal		1	0	=	0
	off-site destruction or treatment		2	0	=	0
	If sub-total = 10, go to Factor 3.	**Sub-Total (maximum = 10)**			=	8
2. Reduction in mobility of hazardous or petroleum waste.	i) Quantity of Available Wastes Immobilized After Destruction/ Treatment					
		90-100% X	2	0	=	2
		60-90%	1	0	=	0
If not applicable, go to next Factor.		<60%	0	0	=	0
	ii) Method of Immobilization					
	- Reduced mobility by containment.	X	0	0	=	0
	- Reduced mobility by alternative treatment technologies.*	X	3	0	=	3
	* - air stripping, natural attenuation (*i.e.*, physiochemical attraction, biodegradation)					
		Sub-Total (maximum = 5)			=	5
3. Irreversibility of the destruction or treatment or immobilization of hazardous and/or petroleum waste.	- Completely irreversible.	X	5	0	=	5
	- Irreversible for most of the waste constituents.		3	0	=	0
	- Irreversible for only some of the waste constituents.		2	0	=	0
	- Reversible for most of the waste constituents.		0	0	=	0
		Sub-Total (maximum = 5)			=	5
		TOTAL (maximum = 20)			=	**18**

Analysis Factor	Basis for Evaluation During Detailed Analysis	Applicability				
IMPLEMENTABILITY		**YES**		**NO**		**Score**
1. Technical Feasibility						
	i) Ability to construct technology					
	Not difficult to construct. No uncertainties in construction.		3		0 =	0
	Somewhat difficult to construct. No uncertainties in construction.	X	2		0 =	2
	Very difficult to construct and/or significant uncertainties in construction.		1		0 =	0
	ii) Reliability of technology					
	Very reliable in meeting the specified process efficiencies or performance goals.		3		0 =	0
	Somewhat reliable in meeting the specified process efficiencies or performance goals.		2	X	0 =	0
	iii) Schedule of delays due to technical problems.					
	Unlikely		2		0 =	0
	Somewhat unlikely	X	1		0 =	1
	iv) Need of undertaking additional remedial action, if necessary.					
	No future remedial actions may be anticipated.		2		0 =	0
	Some future remedial actions may be necessary.	X	1		0 =	1
	Sub-Total (maximum = 10)				=	4
2. Administrative Feasibility						
	i) Coordination with other agencies					
	Minimal coordination is required.	X	2		0 =	2
	Required coordination is normal.		1		0 =	0
	Extensive coordination is required.		0		0 =	0
	Sub-Total (maximum = 2)				=	2
3. Availability of Services and Materials						
a. Availability of prospective technologies.	i) Are selected technologies commercially available for the site-specific application?	X	1		0 =	1
	ii) Will more than one vendor be available to provide a competitive bid?	X	1		0 =	1
b. Availability of necessary equipment and specialists.	i) Additional equipment and specialists may be available without significant delay.	X	1		0 =	1
	Sub-Total (maximum = 3)				=	3
	TOTAL (maximum = 15)				=	**9**

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