Final Design Plan
Permit Condition E.9(c)

Envirosafe Services of Ohio, Inc.

April 26, 2019

Revised July 25, 2019

APPENDIX A
DESCRIPTION OF CORRECTIVE ACTION WORK

Leachate Management

Currently ESOI is managing the collected nonhazardous trench water and leachate from the facility at 876 Oregon Road through various disposal options. Trench water that does not meet the on-site NPDES discharge requirements is collected in on-site tanks and then transported off-site by truck. The current primary disposal location is a manhole into the City of Toledo sanitary sewer on Geo. Gradel Company Front Street property.

Nonhazardous SWMU leachate is collected in on-site tanks and then transported off-site by truck. The current primary disposal location is either a manhole into the City of Toledo sanitary sewer on Geo. Gradel Company Front Street property or DART a Clean Earth Company depending on contaminant concentrations.

Leachate and/or Trench water may not always meet sanitary sewer discharge standards so other vendors are utilized as necessary.

While the Preliminary Design submitted in September, 2018 indicated that ESOI is planning to design a direct connection to a publicly available sewer, disposal through into a public sewer utilizing a discharge point close to the facility was included as an alternate management method. For the foreseeable future ESOI intends to continue the management of nonhazardous trench water and leachate by methods describe above. ESOI is reserving future potential to design and construct a direct connection to a sanitary sewer.

SWMU 5 LNAPL Removal

Corrective action to be undertaken at SWMU 5 includes the active removal of NAPL from the subsurface. The active system is designed to utilize an active NAPL skimmer system. The skimmer will recover the floating hydrocarbons from two wells using a density float skimmer and oleophilic/hydrophobic filter that differentiates between floating hydrocarbons and water. The skimmer will float just above the oil/water interface to collect and remove the NAPL from the well. The removed NAPL will be stored in a 55 gallon drum at the ground surface. The system will be powered using a solar panel.

The preliminary Design assumed that two new wells would be installed for NAPL removal from SWMU 5. During a meeting on March 7, 2019 with Mannik & Smith and Ohio EPA it was suggested that the existing wells may be acceptable for use with the skimmer. Mannik and Smith has researched this suggestion further and found that the existing wells are of sufficient size to accommodate the skimmer. Wells T-20S(2) and T-20S(5) will be used for NAPL removal. As practical, additional wells can be used for NAPL recovery. The solar sipper system is flexible and the equipment can be moved from well to well.

SWMU 6 Northern Sanitary Landfill

The Preliminary Design included a document titled *Excavation Plan for Waste Removal North of the North Sanitary Landfill Fence Line* (Excavation Plan). This document detailed the sequencing, the preparation and the security necessary to relocate the small amount of waste north of the SWMU 6 fence line into Cell M. During a meeting on March 7, 2019, Ohio EPA raised two questions regarding the plan as submitted:

1. Will the waste be loaded into trucks and taken directly to Cell M or will it be stored in roll-offs at the site of excavation?

   Section 10 addresses this question. ”Excavated solid waste material shall be directly loaded onto dump trucks and transported to Cell M . . . “

2. How will ESOI maintain security during the time that the excavation is taking place?

   Section 12 addresses this question. “ESOI will remove the fencing along the impacted area on a daily basis. At the end of each working day, temporary fencing will be installed to maintain security. Upon completion of all work the permanent fence will be reinstalled.”

The relocation of waste is intended to be accomplished in accordance with the Excavation Plan as submitted with this Class 1 modification.

SWMU 8 Old Oil Pond

The Corrective Action work to be done for SWMU 8 includes:

- Installation of a sheet pile wall around the entire waste management unit
- Cap enhancement including grading to promote surface water drainage off of the waste management unit
- Landfill gas venting, and
- NAPL recovery wells
- Demolition of Building C
- Closure of Butz Crock and the Building C heating oil tank
- Improvements to the storm water ditches and AOC 1 (Toledo Waterline Easement)

Currently there is no evidence of contaminants leaking from SWMU 8. The groundwater wells monitoring the waste management unit have not shown any impacts. The corrective action chosen for this unit is intended to mitigate the occurrence of oily seeps at the surface. One of the main causes for the seeps is believed to the buildup of gas pressure. As the pressure increases, it is pushing the oily materials to the surface. Installing gas vents will relieve the pressure and decrease the driving force for the seeps. Additionally, recovering some of the NAPL from SWMU 8 will mitigate the seeps by reducing the source. The sheet pile wall will be installed to accentuate the existing low permeability soils. Sheet pile will be installed below ground surface and keyed into the existing upper till clay unit.

The cap enhancement is intended to ensure positive drainage off of the waste unit. SWMU 8 will be divided into two areas for the management of surface water. The eastern section that is at a higher elevation will be graded such that surface water is conveyed to the northeast corner and ultimately to the pond east of Cell I. The western section, where Building C sits, will be graded such that surface water flows generally to the north and west into the ditch to the south of the waterline easement. As part of the grading work, Building C will be demolished. ESOI intends to leave the concrete slab in place and will place 1.5 to 2 feet of soil over the slab.

Butz Crock, the heating oil tank and associated utilities and any other units encountered within SWMU 8 such as the septic tank associated with AOC 4, the two waste water tanks associated with AOC 5, the second utility vault, will be abandoned in place. Any liquid present in these structures will be removed. A flowable fill will then be used to fill the structure in a manner that will minimize subsidence and prevent additional liquid from collecting. Butz Crock and associated utilities may be removed if in place abandonment interferes with installation of the sheet pile wall.

Improvements to the surface water ditches to the north and south of the City of Toledo Waterline Easement between SWMUs 8 and 9 will consist of regrading to promote drainage and lining with a geosynthetic to minimize infiltration. The waterline easement will also be assessed to determine if there is a need to regrade the soil over the waterline to ensure that surface water is shed to the ditches on the north and south and not allowed to pond on top of the easement.

SWMU 9 Northern Sanitary Landfill

The Corrective Action work to be done for SWMU 9 includes:

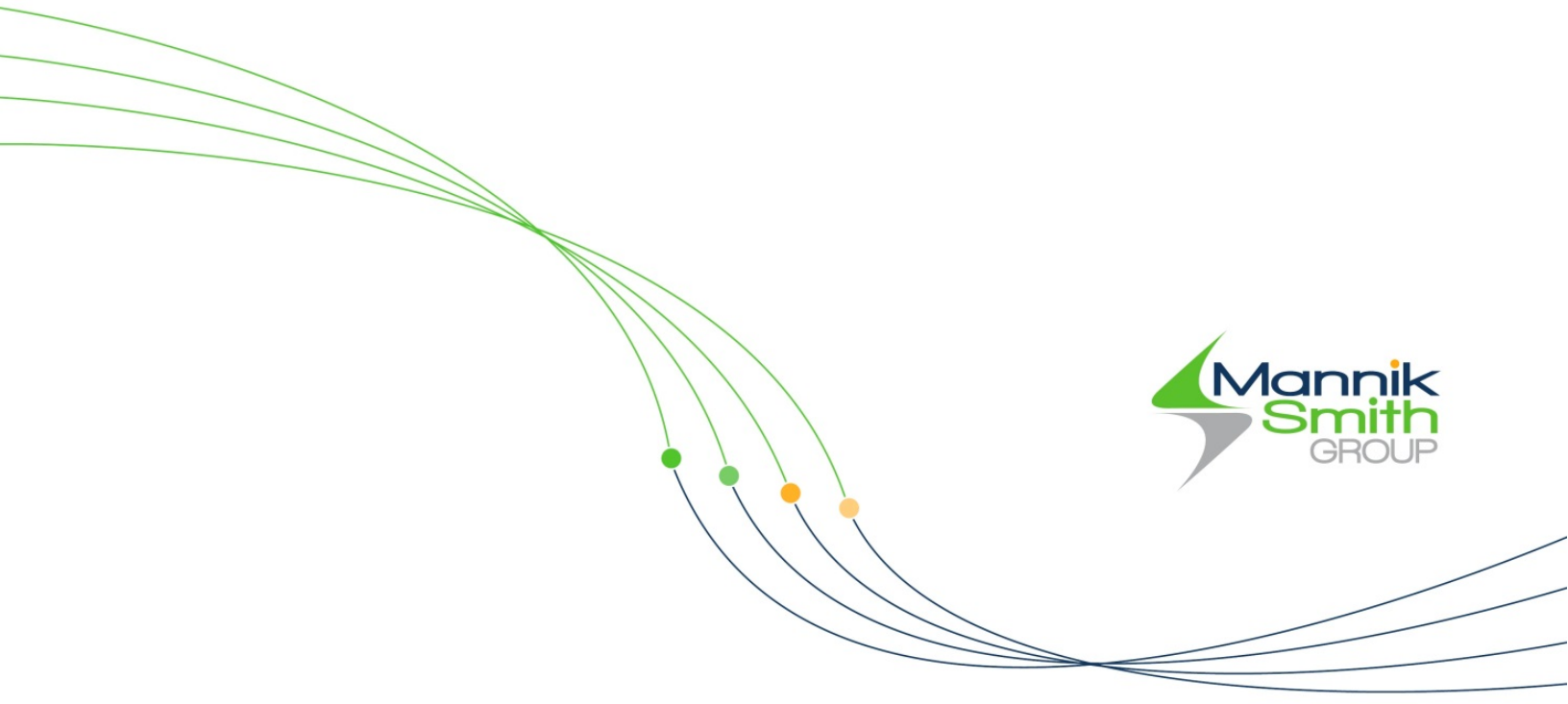
- Installation of a composite cap
- Final grading that promotes the flow of surface water off of the SWMU

Currently SWMU 9 has a large depression on top of the unit that collects surface water. This surface water is seeping through the existing cap into the waste below and eventually pushing out the sides as leachate outbreaks. The initial work to be done for SWMU 9 corrective action will be to investigate the condition of the existing subgrade. This investigation will determine how much, if any, subgrade needs to be removed and reconstructed before the composite cap can be installed. In addition to reconstructing subgrade as necessary, SWMU 9 will be graded to remove any depressions so that surface water will not collect on top of the composite cap.

The composite cap is to be installed as shown on the attached plan sheets. Surface water will be directed to the existing channels and ponds. The composite cap will include a drainage layer to promote the removal of water from the cap system and direct it into the existing channels.

APPENDIX B
FINAL ENGINEERING DESIGN FOR CORRECTIVE ACTION

SWMU 5 LNAPL



1.1 Basis of Design

The purpose of this design analysis is to develop plans to recover NAPL from the area on the west side of SWMU 5 identified during the RFI field investigation. By removing the NAPL the potential for an unacceptable human health risk due to surface seepage will be eliminated. Alternative designs for the removal of NAPL were developed considering the existing conditions of SWMU 5; the design process considered the following design criteria:

- Removal of NAPL from the west side of SWMU 5 to the extent practicable

  During RFI field investigation, subsurface NAPL was recovered from monitoring wells installed into a peat layer along the west side of SWMU 5. A summary of the NAPL measurements and characterization of this liquid is provided in Appendix G. The presence of this material was determined to present a potentially unacceptable human health risk to outdoor routine facility workers if surficial seepage of this material occurred. It was noted in the RFI that the NAPL is from off-site/upstream releases to Otter Creek that occurred prior to construction of the perimeter soil berm for SWMU 5. Nonetheless, ESOI is addressing the presence of NAPL on the facility as part of its corrective measures program.

1.2 Development of Design

- Remove NAPL to the extent practicable with a solar powered active recovery system

  The CMS Report discusses use of a passive system and an active system for the recovery of NAPL in the wells on the west side of SWMU 5. The active system is the chosen corrective measure because it is the more efficient process to remove the NAPL.

  The active system is designed to utilize an active NAPL skimmer system. The skimmer will recover the floating hydrocarbons from two wells using a density float skimmer and oleophilic/hydrophobic filter that differentiates between floating hydrocarbons and water. The skimmer will float just above the oil/water interface to collect and remove the NAPL from the well. The removed NAPL will be stored in a 55 gallon drum at the ground surface. The system will be powered using a solar panel. Additional system information regarding the solar sipper system can be found in the attached manufacturer cut sheets.

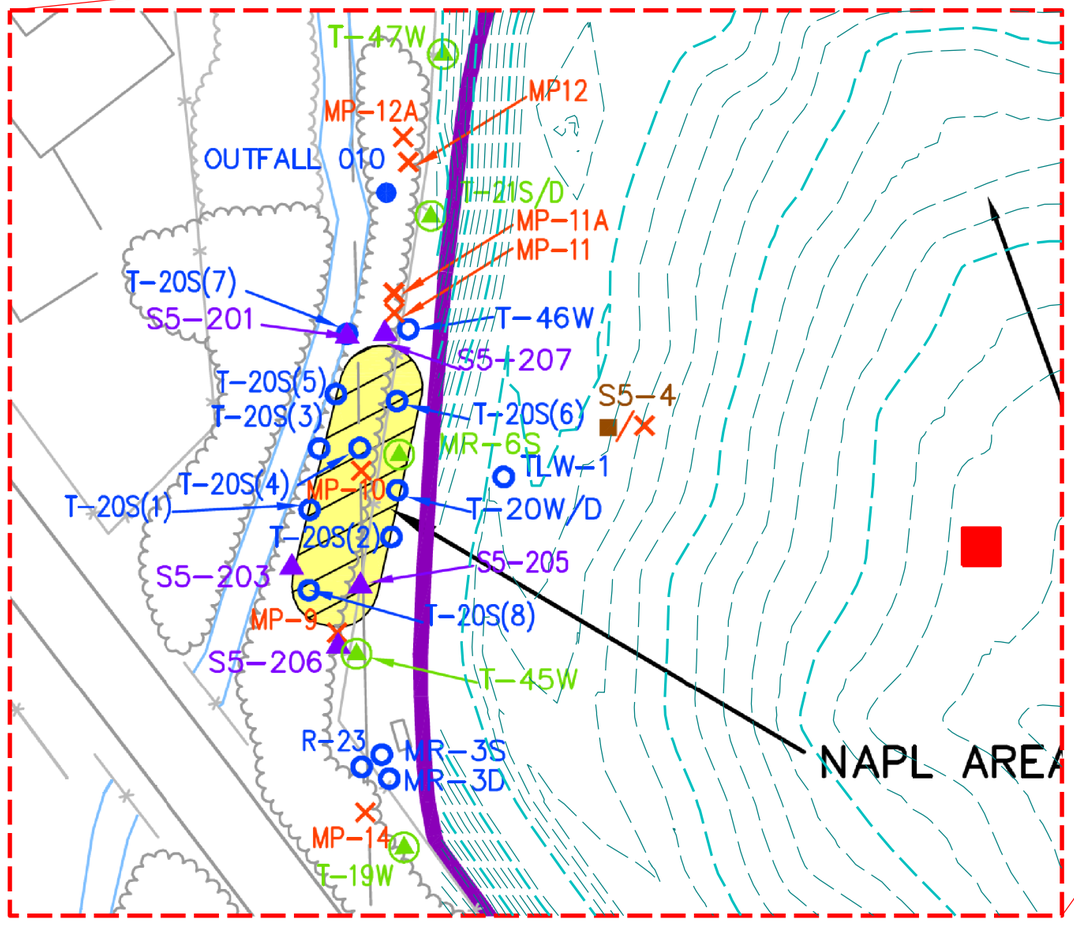
  Wells T-20S(2) and T-20S(5) will initially be utilized for NAPL removal. These wells had the most consistent presence of NAPL present during the LNAPL monitoring that took place from July 2006 through November 2007 as documented in the CMS Report. In T-20S(2) the depth to NAPL was between 13.97 and 15.98 feet and the thickness of the NAPL layer ranged from 0.06 to 0.01 feet. In T-20S(5) the depth to NAPL was between 4.80 and 6.87 feet and the thickness of the NAPL layer ranged from 2.41 to 0.01 feet. Well logs for T-20S (2) and T-20S(5) are attached. As practical, additional wells can be used for NAPL

recovery. The solar sipper system is flexible and the equipment can be moved from well to well.

It is anticipated the control panel, solar array, battery and recovery tank will be located within the ESOI fence line to provide security to these components. Manufacturer's data for the Solar Sippers indicates they can operate to depths up to 180 feet, which allows the location of the control and solar array to be situated at a location that maximizes solar exposure. The collection drum, controller and solar array are anticipated to be installed near the top of SWMU 5 where there is no tall vegetation to block the solar panels and where there is access for equipment to maneuver when the collection drum needs to be emptied. One controller will be able to operate both Solar Sippers to collect material from each of the recovery wells. The Solar Sippers will be operated during the time of year without prolonged periods where temperatures are below freezing; typically from April 1 to November 1.

During the active recovery period, LNAPL monitoring will continue at four wells (T-20S[2], T-20S[5], T-20S[7] and T-20S[8]) in the area. Once recovery using this system reaches practical limits (Geotech Solar Sipper operational information indicate the Sippers can skim the LNAPL down to a sheen), adsorbent socks will be used to address any measurable NAPL that continues to accumulate in the well(s).

FIGURES



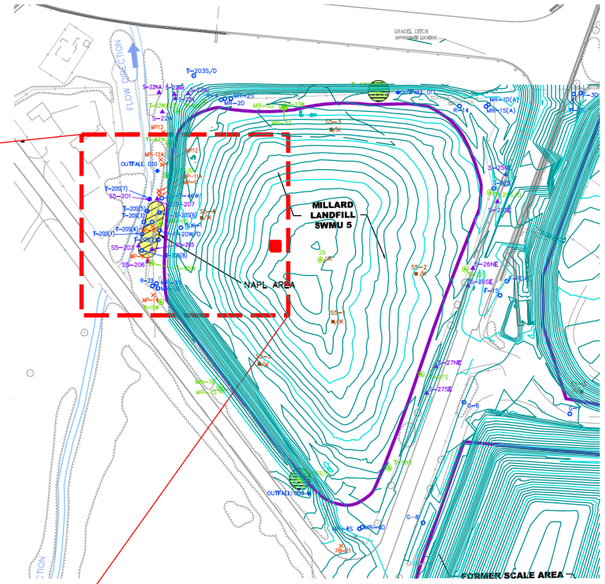
ENLARGED PLAN

GRAPHIC SCALE

0 12.5' 25' 50'

NOTES:

1. INSTALL SOLAR SIPPERS IN T-20S(2) & T-20S(5)
2. INSTALL SOLAR SIPPER APPURTENANCES (CONTROLLER, SOLAR PANELS, COLLECTION DRUM, ETC.) AT APPROXIMATE LOCATION SHOWN.



LOCATION MAP

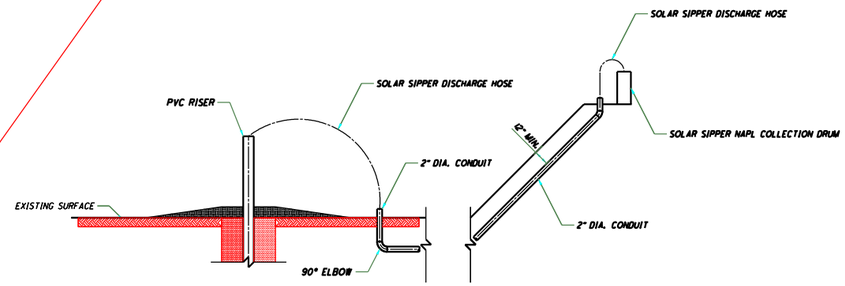
GRAPHIC SCALE

0 62.5' 125' 250'

LEGEND:

- APPROXIMATE LOCATION FOR SOLAR PANELS, CONTROLLER & COLLECTION DRUM FOR SOLAR SIPPER
- RFI WELL (T-#)
- TEMPORERY MONITORING WELL (T-#)
- RFI PHASE II WELL (S5-#)
- IGWMP WELL (MR-#)
- OUTFALL 010 (SURFACE WATER OUTFALL)
- MP-# (EGMP)

IGWMP = INTEGRATED GROUNDWATER MONITORING PROGRAM
EGMP = EXPLOSIVE GAS MONITORING PROBE



SOLAR SIPPER DISCHARGE SCHEMATIC

SCALE: N.T.S.

TECHNICAL SKILL. CREATIVE SPIRIT.

Mannik Smith GROUP

www.MannikSmithGroup.com

ENVIROSAFE

ENVIROSAFE SERVICES OF OHIO, INC.
OREGON FACILITY

ENVIROSAFE - CORRECTIVE ACTION PRELIMINARY ENGINEERING DESIGN

NO.	DATE	BY	DESCRIPTION
2	09/26/2018	SCW	PRELIMINARY ENGINEERING DESIGN
1	04/16/2019	MJG	FINAL ENGINEERING DESIGN

SWMU 5

FIGURE 5.1

4/24/2019

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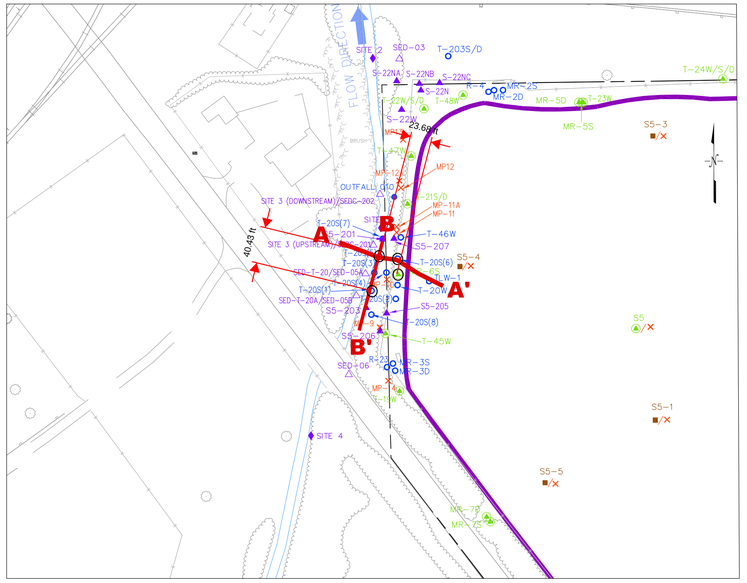
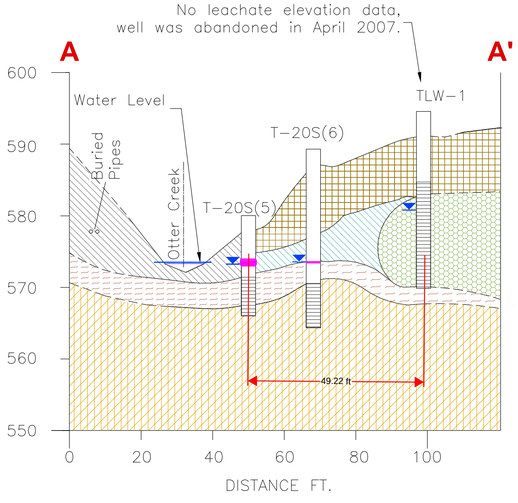
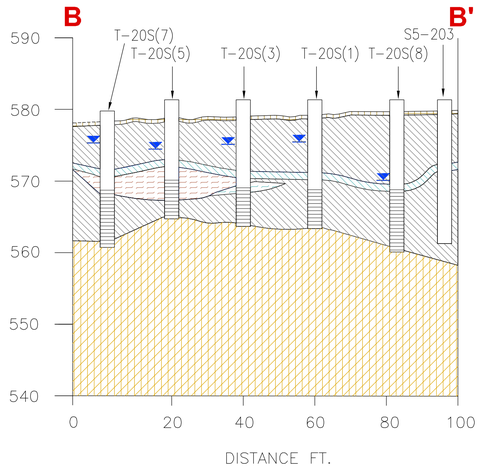
Well	Oil in Voids/Staining	Interval (feet bgs)	Peat/Organic Layer/Staining	Peat/Organic layer depth (ft)	Well Screen Depth (ft)	NAPL in Well	Notes
TLW-1	No oil noted	--	Peat	21 -23	6 - 21	ND	*Soil description from 0 - 23 feet bgs based on drill cuttings and field observations.
T-19W	No oil noted	--	Peat	15 - 18	10 - 15	ND	
	Staining	18 - 22	Staining/Organics	6 - 9			
T-20W	No oil noted	--	--	--	9 - 14	ND	*Soil description taken from T-20S
T-20S	Staining	14 - 16	Peat	16 - 18	17 - 22	ND	
	Oil in voids/staining	18 - 19	--	--			
	Staining	19 - 22	--	--			
T-20S(1)	Staining/odor	6 - 7	Staining/Organics	6 - 7	9.5 - 14.5	ND	
	Staining	8 - 9.5, 10.3 - 10.5	--	--			
T-20S(2)	Staining	11.6 - 17	Peat	18 - 20	16 - 21	Yes	
	Oil in voids	14.2 - 14.5, 17 - 18	Staining/Organics	14 - 18			
	Odor	12 - 18, 19 - 20	--	--			
T-20S(3)	Oil in voids/odor	6.3 - 6.8	Peat-like material	3.8 - 4, 7.5 - 8	8.5 - 13.5	ND	
	Staining	10 - 10.5	--	--			
T-20S(4)	Staining	6 - 9.9, 14 - 16	Peat-like Material	5.8 - 6.1	13 - 18	ND	
	Oil in voids	9.5 - 9.9, 12 - 14	Peat	9.9 - 12			
	Odor	11.9 - 14	--	--			
T-20S(5)	Oil in voids	4 - 6.8	Peat	5.8 - 10	7 - 12	Yes	
	Odor	4 - 8	--	--			
T-20S(6)	Odor	10 - 12	Peat-like material	14 - 16	16 - 21	ND	
	Oil in voids	17 - 18, 19 - 19.6, 20.4 - 21.5	--	--			
	Staining	10.5 - 14, 17 - 18	--	--			
T-21S	No oil noted	--	Peat-like Material	16 - 20	17 - 22	ND	
	Staining	15 - 15.5	--	--			
T-21D	Odor	15 - 16.5, 18.75 - 20.75	Peat	16.5 - 17	63 - 68	ND	
T-22W	Staining	9.5 - 12	Peat-like material	9.5 - 12	7 - 12	ND	*Soil description taken from T-22S
	No oil noted	--	--	--			
T-22S	Staining	9.5 - 12	Peat-like material	9.5 - 12	16 - 21	ND	
	No oil noted	--	Peat	12 - 15.5			
T-22D	Odor	9 - 11	30% Peat	11 - 15	56 - 61	ND	
	No oil noted	--	Peat-like Material	15 - 16			
T-45W	No oil noted	--	--	--	8 - 13	ND	
	Staining	10 - 15	--	--			
T-46W	No oil noted	--	--	--	7 - 12	ND	
	Staining	7 - 8	--	--			
T-47W	No oil noted	--	Peat	8.5 - 9.5, 12 - 12.5, 14 - 16	11 - 16	ND	
	Staining	4.5 - 6.5, 9.5 - 12	--	--			
MR-3D	No oil noted	--	--	--	63 - 68	ND	



KEY MAP
1 INCH = 80 FEET





LEGEND:

- Recompacted Silty Clay
- Lacustrine
- Waste
- Ground Water/Leachate Elevation (October 2007)
- Upper Till
- Stained Lacustrine
- Peat
- NAPL

Note:
Strata to the west of T-20S(5) are estimated, as no borings were conducted west of this location.

DATE	DRWN	REVISIONS

CROSS SECTION A-A' AND B-B' (SWMU 5)

4.1
FIGURE

ENVIROSAFE SERVICES OF OHIO, INC.
OTTER CREEK ROAD FACILITY
OREGON, OHIO

ENVIRON
214 CARNEGIE CENTER, PRINCETON, NJ 08540
www.environcorp.com

2/14/08	AS SHOWN	6174M8X06	2/14/08
DATE	SCALE	CADD FILE	PLOT DATE
ENGINEER	BJK/KPM		MANAGER
DESIGNED BY	DRAFTED BY		APPROVED BY

F:\\026174m8

TABLES

Table 3a
LNAPL Monitoring
ESOI Otter Creek Facility
Oregon, Ohio
Millard Road Landfill SWMU 5

Date	Well	Depth to NAPL (ft)	Depth to Water (ft)	LNAPL Thickness (ft)	Comments
7/20/2006	T-20S (1)	--	4.97	--	Wells were checked for DNAPL. No DNAPL was present
7/20/2006	T-20S (2)	13.97	14.00	0.03	Wells were checked for DNAPL. No DNAPL was present
7/20/2006	T-20S (3)	--	6.17	--	Wells were checked for DNAPL. No DNAPL was present
7/20/2006	T-20S (4)	--	10.19	--	Wells were checked for DNAPL. No DNAPL was present
7/20/2006	T-20S (5)	6.55	7.53	0.98	Wells were checked for DNAPL. No DNAPL was present
7/20/2006	T-20S (6)	--	13.99	--	Wells were checked for DNAPL. No DNAPL was present
7/20/2006	MR-6S	--	12.88	--	Wells were checked for DNAPL. No DNAPL was present
7/20/2006	T-21S	--	15.44	--	Wells were checked for DNAPL. No DNAPL was present
7/20/2006	TLW-1	--	11.83	--	Wells were checked for DNAPL. No DNAPL was present
7/25/2006	T-20S (2)	14.24	14.28	0.04	
7/25/2006	T-20S (5)	6.7	7.71	1.01	Sampled on July 25, 2006, effectively removing the NAPL layer
7/26/2006	T-20S (1)	--	5.3	--	
7/26/2006	T-20S (2)	14.22	14.25	0.03	
7/26/2006	T-20S (3)	--	6.42	--	
7/26/2006	T-20S (4)	--	10.4	--	
7/26/2006	T-20S (5)	6.83	7.12	0.29	
7/26/2006	T-20S (6)	--	14.12	--	
7/27/2006	T-20S (5)	6.74	7.00	0.26	
7/28/2006	T-20S (5)	5.59	5.79	0.20	Heavy rain fell the previous night
8/1/2006	T-20S (1)	--	5.16	--	
8/1/2006	T-20S (2)	14.1	14.13	0.03	
8/1/2006	T-20S (3)	--	6.22	--	
8/1/2006	T-20S (4)	--	10.3	--	
8/1/2006	T-20S (5)	6.34	6.63	0.29	
8/1/2006	T-20S (6)	--	13.98	--	
8/1/2006	MR-6S	--	13.06	--	
8/1/2006	T-20W	--	8.54	--	
8/1/2006	T-21S	--	15.46	--	
8/1/2006	T-46W	--	10.31	--	
8/1/2006	T-47W	--	14.19	--	
8/1/2006	T-45W	--	11.11	--	
8/1/2006	TLW-1	--	12.25	--	
8/3/2006	T-20S (1)	--	5.14	--	
8/3/2006	T-20S (2)	14.08	14.09	0.01	
8/3/2006	T-20S (3)	--	6.21	--	
8/3/2006	T-20S (4)	--	10.31	--	
8/3/2006	T-20S (5)	6.53	6.71	0.18	Checked for DNAPL , but it was not present.
8/3/2006	T-20S (6)	--	14.03	--	
8/3/2006	MR-6S	--	13.06	--	
8/3/2006	T-20W	--	8.51	--	
8/3/2006	T-21S	--	15.51	--	
8/3/2006	T-46W	--	10.34	--	
8/3/2006	T-47W	--	14.14	--	
8/3/2006	T-45W	--	11.36	--	
8/3/2006	TLW-1	--	12.39	--	Checked for DNAPL , but it was not present.

Table 3a
LNAPL Monitoring
ESOI Otter Creek Facility
Oregon, Ohio
Millard Road Landfill SWMU 5

10/26/2006	T-47W	--	14.32	--	
10/26/2006	T-45W	--	10.37	--	
10/30/2006	T-20S (1)	--	5.54	--	
10/30/2006	T-20S (2)	14.4	14.41	0.01	
10/30/2006	T-20S (3)	--	6.05	--	
10/30/2006	T-20S (4)	--	10.15	--	
10/30/2006	T-20S (5)	6.27	6.28	0.01	
10/30/2006	T-20S (6)	--	13.78	--	
10/30/2006	T-20S (7)	--	7.4	--	DTB from TOC is 17.47'
10/30/2006	T-20S (8)	--	13.37	--	DTB from TOC is 20.33'
10/30/2006	MR-6S	--	13.19	--	
10/30/2006	T-20W	--	8.23	--	
10/30/2006	T-21S	--	14.8	--	
10/30/2006	T-46W	--	10.54	--	
10/30/2006	T-47W	--	13.19	--	
10/30/2006	T-45W	--	10.37	--	
10/30/2006	TLW-1	--	10.37	--	
11/1/2006	T-20S (1)	--	5.67	--	Time: 1301
11/1/2006	T-20S (2)	14.56	14.57	0.01	Time: 1312
11/1/2006	T-20S (3)	--	6.18	--	Time: 1259
11/1/2006	T-20S (4)	--	10.3	--	Time: 1255
11/1/2006	T-20S (5)	6.15	6.35	0.2	Time: 1308
11/1/2006	T-20S (6)	--	13.94	--	Time: 1253
11/1/2006	T-20S (7)	--	7.5	--	Time: 1306
11/1/2006	T-20S (8)	--	11.94	--	Time: 1303
8/27/2007	T-20S (1)	--	5.72	--	Wells were checked for DNAPL. No DNAPL was present
8/27/2007	T-20S (2)	15.39	15.45	0.06	Wells were checked for DNAPL. No DNAPL was present
8/27/2007	T-20S (3)	--	6.33	--	Wells were checked for DNAPL. No DNAPL was present
8/27/2007	T-20S (4)	--	10.41	--	Wells were checked for DNAPL. No DNAPL was present
8/27/2007	T-20S (5)	6.62	6.86	0.24	Wells were checked for DNAPL. No DNAPL was present
8/27/2007	T-20S (6)	14.94	14.95	0.01	Wells were checked for DNAPL. No DNAPL was present
8/27/2007	T-20S (7)	--	7.69	--	Wells were checked for DNAPL. No DNAPL was present
8/27/2007	T-20S (8)	--	10.26	--	Wells were checked for DNAPL. No DNAPL was present
8/27/2007	MR-6S	14.72	14.73	0.01	Wells were checked for DNAPL. No DNAPL was present
8/27/2007	T-21S	--	15.12	--	Wells were checked for DNAPL. No DNAPL was present
8/27/2007	TLW-1	--	--	--	Well is missing, presumed destroyed.
SWMU 5 LNAPL Bail-down Test					
8/27/2007	MR-6S	14.72	14.73	0.01	Time: 1720 No FP or sheen noted on purged water, will not include in bail-down test.
8/27/2007	T-20S (2)	15.42	15.45	0.03	Time: 1725
8/27/2007	T-20S (5)	6.62	6.86	0.24	Time: 1748
8/27/2007	T-20S (6)	14.96	14.97	0.01	Time: 1740
8/27/2007	T-20S (2)	15.98	15.99	0.01	Time: 1800
8/27/2007	T-20S (5)	6.8	6.84	0.04	Time: 1752
8/27/2007	T-20S (6)	15.3	15.31	0.01	Time: 1807
8/27/2007	T-20S (2)	15.96	15.97	0.01	Time: 1830
8/27/2007	T-20S (5)	6.68	6.72	0.04	Time: 1812
8/27/2007	T-20S (6)	15.32	15.33	0.01	Time: 1821

Table 3a
LNAPL Monitoring
ESOI Otter Creek Facility
Oregon, Ohio
Millard Road Landfill SWMU 5

8/8/2006	T-20S (1)	--	5.49	--	
8/8/2006	T-20S (2)	14.38	14.395	0.015	Checked for DNAPL , but it was not present.
8/8/2006	T-20S (3)	--	6.46	--	
8/8/2006	T-20S (4)	--	10.5	--	
8/8/2006	T-20S (5)	6.83	6.86	0.03	Checked for DNAPL , but it was not present.
8/8/2006	T-20S (6)	--	14.22	--	
8/8/2006	MR-6S	--	13.19	--	
8/8/2006	T-20W	--	8.83	--	
8/8/2006	T-21S	--	15.61	--	
8/8/2006	T-46W	--	10.53	--	
8/8/2006	T-47W	--	14.49	--	
8/8/2006	T-45W	--	11.97	--	
8/8/2006	TLW-1	--	12.91	--	
8/10/2006	T-20S (1)	--	5.38	--	
8/10/2006	T-20S (2)	14.31	14.32	0.01	Checked for DNAPL , but it was not present.
8/10/2006	T-20S (3)	--	6.44	--	
8/10/2006	T-20S (4)	--	10.43	--	
8/10/2006	T-20S (5)	6.87	6.89	0.02	Checked for DNAPL , but it was not present.
8/10/2006	T-20S (6)	--	14.19	--	
8/10/2006	MR-6S	--	13.24	--	
8/10/2006	T-20W	--	8.87	--	
8/10/2006	T-21S	--	15.6	--	
8/10/2006	T-46W	--	10.54	--	
8/10/2006	T-47W	--	14.41	--	
8/10/2006	T-45W	--	12.02	--	
8/10/2006	TLW-1	--	12.81	--	
10/24/2006	T-20S (1)	--	5.26	--	
10/24/2006	T-20S (2)	14.14	14.15	0.01	
10/24/2006	T-20S (3)	--	6.13	--	
10/24/2006	T-20S (4)	--	10.22	--	
10/24/2006	T-20S (5)	6.15	8.56	2.41	Bailed down NAPL
10/24/2006	T-20S (6)	--	14.02	--	
10/24/2006	MR-6S	--	13.17	--	
10/24/2006	T-20W	--	8.52	--	
10/24/2006	T-21S	--	15.08	--	
10/24/2006	T-46W	--	10.98	--	
10/24/2006	T-47W	--	14.1	--	
10/24/2006	T-45W	--	10.37	--	
10/24/2006	TLW-1	--	10.87	--	
10/26/2006	T-20S (1)	--	6.37	--	
10/26/2006	T-20S (2)	15.27	15.28	0.01	
10/26/2006	T-20S (3)	--	6.33	--	
10/26/2006	T-20S (4)	--	10.64	--	
10/26/2006	T-20S (5)	6.74	6.78	0.04	
10/26/2006	T-20S (6)	--	14.14	--	
10/26/2006	MR-6S	--	13.25	--	
10/26/2006	T-20W	--	8.51	--	
10/26/2006	T-21S	--	15.33	--	
10/26/2006	T-46W	--	10.76	--	

Table 3a
LNAPL Monitoring
ESOI Otter Creek Facility
Oregon, Ohio
Millard Road Landfill SWMU 5

11/28/2007	T-20S (1)	--	6.5	--	Wells were checked for DNAPL. No DNAPL was present
11/28/2007	T-20S (2)	14.92	15.30	0.38	Wells were checked for DNAPL. No DNAPL was present
11/28/2007	T-20S (3)	--	7.27	--	Wells were checked for DNAPL. No DNAPL was present
11/28/2007	T-20S (4)	--	11.10	--	Wells were checked for DNAPL. No DNAPL was present
11/28/2007	T-20S (5)	4.80	6.50	1.70	Wells were checked for DNAPL. No DNAPL was present
11/28/2007	T-20S (6)	15.80	16.20	0.40	Wells were checked for DNAPL. No DNAPL was present
11/28/2007	T-20S (7)	--	7.80	--	Wells were checked for DNAPL. No DNAPL was present
11/28/2007	T-20S (8)	--	11.90	--	Wells were checked for DNAPL. No DNAPL was present

Table 3a LNAPL Monitoring
ESOI Otter Creek Facility
Oregon, Ohio
Millard Road Landfill - SWMU 5

Date	Well	Depth to NAPL (ft)	Depth to Water (ft)	LNAPL Thickness (ft)	Comments
6/2/2010	T-20S (1)	--	5.53	--	Wells were checked for DNAPL. No DNAPL was present
	T-20S (2)	15.5	15.83	0.33	
	T-20S (3)	--	5.95	--	Wells were checked for DNAPL. No DNAPL was present
	T-20S (4)	--	10.11	--	Wells were checked for DNAPL. No DNAPL was present
	T-20S (5)	6.06	6.79	0.73	
	T-20S (6)	14.93	15.09	0.16	
	T-20S (7)	--	7.46	--	Wells were checked for DNAPL. No DNAPL was present
	T-20S (8)	--	11.95	--	Wells were checked for DNAPL. No DNAPL was present
	MR-6S	--	14.76	--	
	T21S	--	15.36	--	Wells were checked for DNAPL. No DNAPL was present
	T20W	--	8.18	--	Well is missing, presumed destroyed.
	T45W	--	12.15	--	
	T46W				Unable to locate, presumed abandoned.

GO TO GEOTECH

Hydrocarbon Recovery System

Geotech Single & Multi-Well Solar Sipper

The Geotech Solar Sipper is a solar powered remediation system, designed for remote applications where electrical power is either not available or not economically feasible. This uniquely flexible system can be configured for up to eight wells. The compact, easy to install features make this unit efficient to move and implement multiple wells.

The Solar Sipper uses a unique downwell pump to recover hydrocarbons through a floating oleophilic/hydrophobic intake filter. Once the pump canister is filled via the vacuum cycle, the pump reverses, pressurizes the system and pumps the recovered fluid to the surface and into a storage vessel.

The Geotech Solar Sipper can effectively extract fluids from depths to 180 feet below ground surface and recover viscous hydrocarbons such as 90 weight oil when our heavy oil skimmer is utilized.

EASE OF DEPLOYMENT

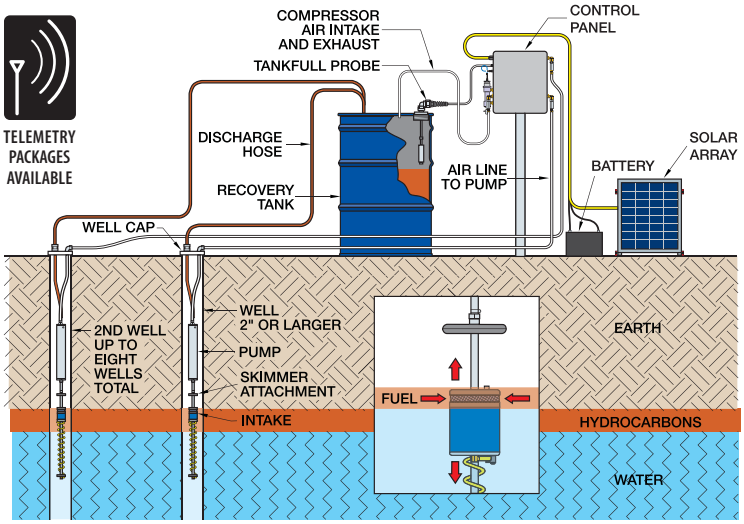
The Solar Sipper can reduce overall project costs and dramatically improve deployment:

- Available in single or multi-well configurations
- Reduces the time and cost for a power line to be run to a site.
- Eliminates the need for electricians to do install work and permitting.
- The simple and safe low voltage system can be installed without special training or licensing and requires minimal experience.
- No trenching or transformer equipment is required.
- Relocating equipment to follow a plume or to adjust to new site characterization information is fast and easy.

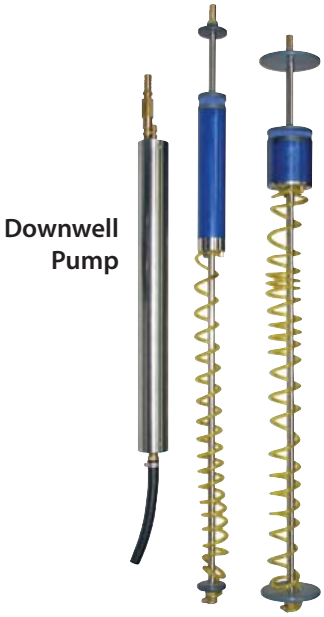
OPERATION

The Geotech Solar Sipper recovers floating hydrocarbons (LNAPL) from wells using a solar powered pressure/vacuum pump. The standard Skimmer features a unique product intake assembly that incorporates both a density float and an oleophilic/hydrophobic filter that differentiates between floating hydrocarbons and water. The skimmer floats just above the oil/water interface to collect and remove hydrocarbons from the well into an optional above ground storage tank.

The Geotech Solar Sipper is also available for recovery of sinking product (DNAPL) from wells when using a fixed intake.



Control Panel and Pressure/Vacuum Pump
(eight-well controller shown)



Downwell Pump

2" Skimmer with Optional Protective Screen

2" and 4" Skimmers

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email: sales@geotechenv.com website: www.geotechenv.com

Hydrocarbon Recovery System

Geotech Single & Multi-Well Solar Sipper

DESIGN YOUR RECOVERY SYSTEM

Step 1: Control Panel

- ✔ Choose from 1 to 8 wells
  - NEMA 3R Enclosure
  - Tankfull Shut-Off Switch (3/4" or 2" NPT bung-fitting)
  - Microprocessor Controlled 2-Line LCD Display with four scroll buttons
  - On/Off Switch
  - Pressure/Vacuum Pump
  - Pressure/Vacuum Gauge

Step 2: Solar Accessories

- ✔ 100 watt solar panel(s) with adjustable mounting frame
- ✔ AGM Solar Batteries 104 AH, 12 Volt

AC powered versions are available

Step 3: Downwell Equipment

- ✔ Downwell Pump(s)
  - Standard
  - With Conductivity Sensor
- ✔ Skimmer(s)
  - 2" or 4" Skimmer with 100 or 60 Mesh Intake
  - 2" or 4" Protective Screen
  - 4" Skimmer with Extended Travel
  - 4" Heavy Oil Skimmer
  - 4" High Temperature/Heavy Oil Skimmer
  - 2" DNAPL Intake

Other Options:

- ✔ 2" or 4" Slip Fit Well Cap(s)
- ✔ Choose Length: Air and Discharge Tubing
- ✔ 55 Gallon Steel Product Drum(s)
- ✔ Dual-Wall Containment Product Recovery Tank(s)
- ✔ Lockable Weatherproof Enclosure
- ✔ Trailer for Mounting Mobile System
- ✔ Telemetry Packages

3-Well Solar Sipper on trailer with dual containment tank

Solar Sipper installation with bovine protection

Solar Sipper installation mounted on hazmat enclosure

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Hydrocarbon Recovery System

Geotech Single & Multi-Well Solar Sipper

SPECIFICATIONS

Applications:	2" (50 mm) or larger recovery wells
Recovery Rate:	.2 gallons (757 ml) per cycle
Maximum Operating Depth:	180 feet (55m)
Power Requirements:	12-15 Volts DC input @ up to 14.5 Amps 90~240 Watts continuous
Maximum Pressure:	100 PSIG (7 bar)
Maximum Vacuum:	20" Hg @ MSL (50mm Hg)
Oil/Water Separation:	Oleophilic/hydrophobic mesh screen
Controller:	
Operating Temperature	32° to 104°F (0° to 40°C)
Storage Temperature Range	-20° to 150°F (-29° to 66°C)
Humidity	90% non-condensing (max)
Size	10" D x 18" T x 16" W (25.4cm D x 45.7cm T x 40.6cm W)
Approximate Weight	34 lbs. (15.4 kg) single channel 49 lbs. (22. 2 kg) eight channel
Rating	NEMA 3R
Optional Solar Panel w/Frame:	
Rated Power	100 Watts (standard unit)
Operating Voltage	17.4 Volts DC
Maximum Voltage	21.5 Volts DC
Operating Amperage	4.88 Amps (standard unit)
Maximum Amperage	5.8 Amps
Size	41.2" H x 27.5" W (105 cm H x 70 cm W)
Approximate Weight	23.3 lbs. (10.5 kg)
Optional Downwell Pump:	
Size	23.5" L x 1.75" OD (59.7cm L x 4.4cm OD)
Weight	4.5 lbs. (2.04 kg)
Materials	303 and 304 Stainless Steel, Flexible Rubber Tubing, PVC, Brass

Optional Skimmer Assemblies:	**2" Model**	**4" Model**
Effective Travel Range	12" (30.5cm)	24" (61 cm)
Size	35.5" L x 1.75" OD (90.2cm L x 4.4cm OD)	35.5" L x 3.75" OD (90.2cm L x 9.5cm OD)
Weight	1.75 lbs. (.79 kg)	2.25 lbs. (1.02 kg)
Operating Temperature	32° to 104°F (0° to 40°C)	
Storage Temperature	-20° to 150°F (-29° to 66°C)	
Materials	304 Stainless Steel, Polyethylene, PVC, Polypropylene, Brass	

Optional Tubing:	
Air	.17" ID (4.3mm ID)
Discharge	.375" ID (9.5mm ID)

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Mannik Smith Group, Inc.

Temporary Monitoring Well Number: T-20S(2)

Project No: F20C7Q2
Project Name: Envirosafe SWMU5 RFI
Client: ESOI Oregon Facility
Site Location: SWMU 5

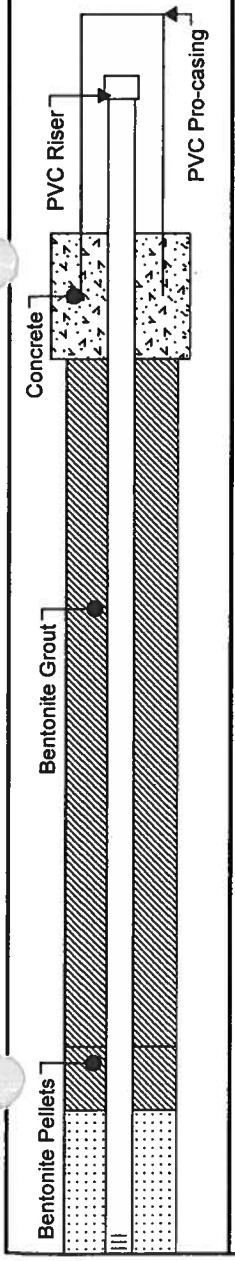
MSG Personnel: Nicholas Bohland
Approved By:
Contractor: TTL Associates, Inc.
Driller: Tony Brister
Drilling Method: 4.25 HSA w/ SS
Drill Rig: CME 550 ATV

Start/End Date: 5/25/04
Boring Depth: 24 feet
Northing: 11540.72
Easting: 9748.97
Top of PVC Elev.: 589.70 feet
Ground Surface Elev.: 587.65 feet

Construction Mat.: Schedule 40 PVC
Riser/Screen Dia.: 2 inch
Riser Length: 18.05 feet
Screen Length: 5 feet

Screen Slot Size: 0.010 inch
Soil Borehole Dia.: 8.25 inch
Rock Borehole Dia.: Not Encountered

Pro-casing Mat.: Schedule 40 PVC
Seal/Grout Mat.: Bent. Grout/Pellets
Filter Pack Mat.: #5 Silica Sand



Depth	Elevation	Description	Number	Type	Blows/ft	Recovery	FID/PID (ppm)	Remarks
0	587.65	Ground Surface						
0–6		***Silty Clay*** Brown and gray Silty Clay with rootlets, some gravel, low plasticity, stiff, dry. Some black and gray sand at 3.2, 4 and 5.8 feet. Gravel piece at 4.6 feet.	SS1	SS	2 3 5 7	20"	2.9	
			SS2	SS	6 8 10 8	18"	2.2	
			SS3	SS	2 4 4 6	16"	1.9	
6–8	581.65	***Silty Clay*** Brown and gray Silty Clay becoming more gray with depth, stiff to softer with depth, some gravel and orange silt seams.	SS4	SS	4 6 5 5	20"	2.1	
8–10	579.65	***Silty Clay*** Gray Silty Clay with some olive-green staining at 9.2 feet, dry, stiff. Softer, damp, and high plasticity from 8.5-10 feet.	SS5	SS	2 3 4 2	20"	2.2	
10–12	577.65	***Silty Clay*** Gray Silty Clay with some tan and olive-green mottles, black staining and olive-green mottles from 11.6-12 feet, moist from 10.5-10.8 feet, damp and medium plasticity from 10.8-12 feet.	SS6	SS	4 5 5 5	24"	2.8	
12–14	575.65	***Silty Clay*** Gray Silty Clay with olive-green and black staining throughout, soft, damp, some fine sand (>1mm) at 13.6 feet, low plasticity with a petroleum odor.	SS7	SS	0 0 3 4	24"	64.5	
14–16	573.65	***Silty Clay*** Gray Silty Clay with black staining and organic material, damp, soft, slight petroleum odor, some small oil spots in voids from 14.2-14.5 feet, olive-green staining and some wood fragments from 14.5-15 feet.	SS8	SS	4 2 2 3	24"	27.9	
16	571.65							

The Mannik Smith Group, Inc.

Page 2 of 2 | ***Temporary Monitoring Well Number: T-20S(2)***

Project No: F20C7Q2
Project Name: Envirosafe SWMU5 RFI
Client: ESOI Oregon Facility
Site Location: SWMU 5

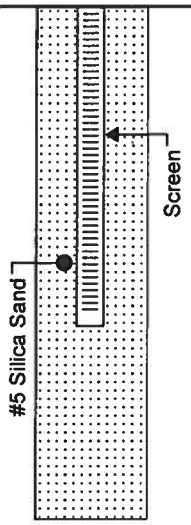
MSG Personnel: Nicholas Bohland
Approved By:
Contractor: TTL Associates, Inc.
Driller: Tony Brister
Drilling Method: 4.25 HSA w/ SS
Drill Rig: CME 550 ATV

Start/End Date: 5/25/04
Boring Depth: 24 feet
Northing: 11540.72
Easting: 9748.97
Top of PVC Elev.: 589.70 feet
Ground Surface Elev.: 587.65 feet

Construction Mat.: Schedule 40 PVC
Riser/Screen Dia.: 2 inch
Riser Length: 18.05 feet
Screen Length: 5 feet

Screen Slot Size: 0.010 inch
Soil Borehole Dia.: 8.25 inch
Rock Borehole Dia.: Not Encountered

Pro-casing Mat.: Schedule 40 PVC
Seal/Grout Mat.: Bent. Grout/Pellets
Filter Pack Mat.: #5 Silica Sand



Depth	Elevation	Symbol	Description	Number	Type	Blows/ft	Recovery	FID/PID (ppm)	Remarks
17			***Silty Clay*** Gray Silty Clay, damp, soft, low plasticity, slight petroleum odor, black organic material, rootlets and peat from 16-17 feet, fine sand and gravel with olive-green staining, oil in voids from 17-18 feet.	SS9	SS	3 5 5 8	24"	24.8	
18	569.65								
19			***Peat*** Black Peat-like material from 18-19 feet with some sand and gravel, damp. Becoming brown with some olive-green sand with a trace of gravel, stiff, low plasticity, slight petroleum odor from 19-20 feet. No visible oil.	SS10	SS	1 2 3 2	24"	0.8	
20	567.65								
21			***Silty Clay*** Gray and brown Silty Clay with sand and gravel, saturated from 20-20.3 feet. Stiffer and more gray with vertical orange silt seams from 20.3-22 feet.	SS11	SS	5 8 12 18	24"	1.6	
22	565.65								
23			***Silty Clay*** Gray Silty Clay with orange and tan silt seams. 1/2 inch cobble at 22.3 feet. Gray silty clay with trace of gravel, dry, low plasticity from 22.3-24 feet.	SS12	SS	5 3 10 9	24"	0.7	
24	563.65		End of Borehole						
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									

The Mannik & Smith Group, Inc.

Page 1 of 1 | ***Temporary Monitoring Well Number: T-20S(5)***

Project No: F20C7Q2
Project Name: Envirosafe SWMU5 RFI
Client: ESOI Oregon Facility
Site Location: SWMU 5

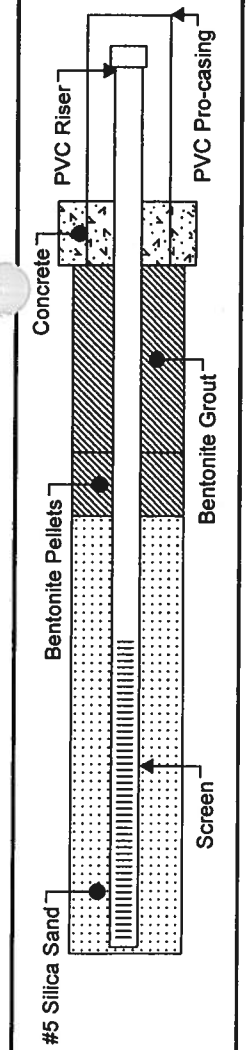
MSG Personnel: Nicholas Bohland
Approved By:
Contractor: TTL Associates, Inc.
Driller: Tony Brister
Drilling Method: 4.25 HSA w/ SS
Drill Rig: CME 550 ATV

Start/End Date: 5/27/04
Boring Depth: 14 feet
Northing: 11598.48
Easting: 9741.35
Top of PVC Elev.: 580.56 feet
Ground Surface Elev.: 578.33 feet

Construction Mat.: Schedule 40 PVC
Riser/Screen Dia.: 2 inch
Riser Length: 9.23 feet
Screen Length: 5 feet

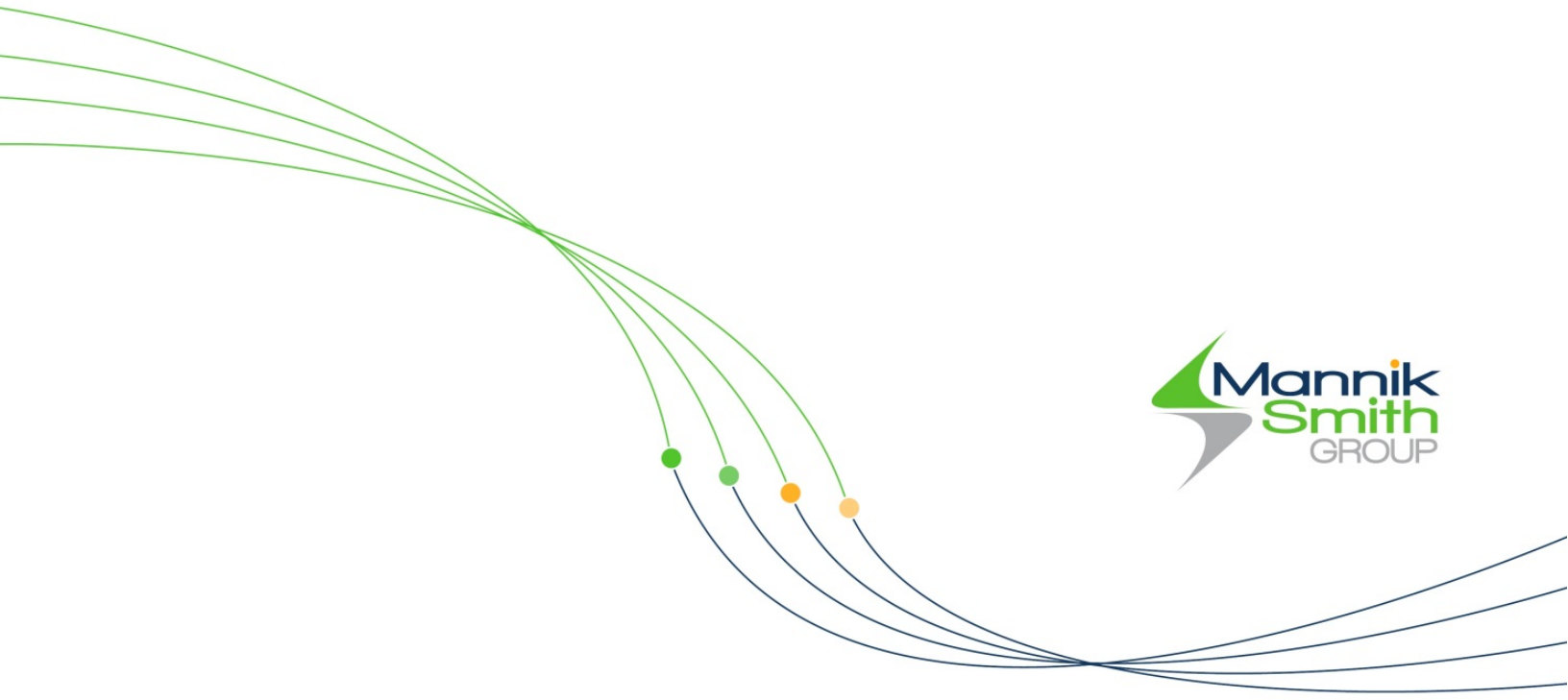
Screen Slot Size: 0.010 inch
Soil Borehole Dia.: 8.25 inch
Rock Borehole Dia.: Not Encountered

Pro-casing Mat.: Schedule 40 PVC
Seal/Grout Mat.: Bent. Grout/Pellets
Filter Pack Mat.: #5 Silica Sand



Depth	Elevation	Description	Number	Type	Blows/ft	Recovery	FID/PID (ppm)	Remarks
-3								
-2								
-1								
0	578.33	Ground Surface						
0		***Silty Clay*** Brown and gray Silty Clay, damp, low plasticity, with some rust colored silt from 2-4 feet.	SS1	SS	5 3 6 9	10"	0.0	
2			SS2	SS	4 5 8 8	10"	0.0	
4	574.33	***Silty Clay*** Brown and gray Silty Clay, with a trace of gravel. Black stained at 5.5 feet with wood fragments, rootlets, and peat-like material from 5.8-6 feet, damp, some brown oil in voids with petroleum odor.	SS3	SS	2 2 3 4	24"	16.1	
6	572.33	***Peat*** Black stained Peat-like material with some gray and black clay, soft, some oil from 6-6.8 feet. Becoming brownish peat-like material, crumbly, damp, wood fragments, rootlets, slight petroleum odor.	SS4	SS	2 2 3 2	24"	7.8	
8	570.33	***Peat*** Brown Peat-like material with some clay, bluish-gray to greenish from 9-10 feet, some rootlets and sand and gravel, soft, moist to saturated with some silty clay, sand and gravel from 9.8-10 feet.	SS5	SS	1 1 2 2	24"	4.8	
10	568.33	***Silty Clay*** Bluish-green Silty Clay approximately 3 inches thick, to gray saturated sand and gravel approximately 16 inches thick, then stiff gray silty clay with trace of gravel, damp.	SS6	SS	1 2 1 4	20"	1.2	
12	566.33	***Silty Clay*** Gray Silty Clay with trace of gravel, tan silt seams to all gray from 13.8-14 feet, damp, stiff.	SS7	SS	3 5 8 12	24"	0.8	
14	564.33	End of Borehole						
15								
16								
17								

SWMU 6 NORTHERN SANITARY LANDFILL



1.1 Basis of Design

The purpose of this design analysis is to develop a plan to relocate waste currently outside of the fence line along the northern edge of the Northern Sanitary Landfill.

- Relocation of waste identified outside of the ESOI fence line

During the initial RCRA RFI and the subsequent North Sanitary Landfill RFI field investigation, a series of borings were installed to delineate the horizontal and vertical extent of waste that exist outside of the facility fence. Analytical data and visual observations obtained during these investigations indicate that the thickness of the solid waste material encountered varied from less than one (1) foot to twelve (12) feet, with most thicknesses less than two (2) feet.

1.2 Development of Design

- Excavation work plan development and goals

  A work plan has been developed that outlines the steps to be taken to remove the waste that is outside the fence line and place it into the active Cell M. The work plan is attached.

  Considerations discussed in the work plan include:

  - **Site Description** – a discussion of where the waste is located. This includes results from the boring investigations that were completed as well as plan sheets that show the location.
  - **Construction Sequence** – outlines the steps that will be taken to systematically excavate and relocate the waste material.
  - **Site Preparation** – any necessary work to be sure the area is ready to be excavated (i.e. survey stakes added, grubbing or other surface prep work)
  - **Security** – explanation of the steps necessary to maintain restricted access and security on site.
  - **Evaluation of Potential Permitting Obligations** – discussion of any need for additional permits that should be considered prior to the work commencing
  - **Soil Erosion and Sediment Control / Stormwater Management** – a description of the controls to be implemented prior to the work commencing
  - **Soil Excavation and Excavated Soil Management** – a discussion on the separation of materials during the excavation. Clean soils are to be stockpiled for later use, waste materials are to be disposed of in Cell M.
  - **Soil Screening** – identifies methods to be used during excavation to verify or supplement the findings of the boring investigations.
  - **Soil Disposal, Staging and Loadout** – excavated waste will be segeregated and properly disposed in Cell M. Clean soil will be staged for use in site restoration.

- **Storm Water Runoff and Leachate Control** – discusses the potential to manage storm water or leachate and what precautions are to be taken to ensure any such liquids are managed appropriately.
- **Site Restoration** – steps to be taken to ensure that area is properly backfilled and vegetation and storm water flow are re-established.
- **Quality Assurance and Quality Control** – outlines the oversight necessary to ensure the excavation plan is appropriately followed.

Excavation Plan for Waste removal

EXCAVATION PLAN FOR WASTE REMOVAL NORTH OF THE NORTH SANITARY LANDFILL (NSL) (SWMU 6) FENCE LINE

U.S. EPA I.D. NO. OHD 045 243 706

Submitted By:

Envirosafe Services of Ohio, Inc.
Oregon, Ohio

Submitted To:

Ohio EPA

Prepared By:

ENVIROSOURCE TECHNOLOGIES, INC.

Hatboro, Pennsylvania

RAMBOLL

Princeton, New Jersey

Date:

September 2018

CONTENTS

DRAWINGS

1. INTRODUCTION

This excavation work plan (work plan) has been prepared by Ramboll US Corporation (Ramboll) and Envirosource Technologies, Inc. on behalf of Envirosafe Services of Ohio, Inc. (ESOI) to address removal of buried solid waste delineated north of the North Sanitary Landfill (NSL) Solid Waste Management Unit (SWMU) 6 fence line and property line (see **Drawings 1 and 2**). The horizontal and vertical extents of this waste were characterized as part of soil boring investigation activities completed during the Initial RCRA (Resource Conservation and Recovery Act) Facility Investigation (RFI) and Supplemental NSL RFI. Analytical data and visual observations obtained during these investigation indicate that the thickness of the solid waste material encountered varied from less than one (1) foot to twelve (12) feet, with most thicknesses less than two (2) feet.

A volume of approximately 200 cubic yards of solid waste material will be excavated from this area and relocated to the on-site active landfill, Cell M, for disposal. Based on the delineation sampling conducted as part of the NSL RFI, approximately 0 to 5 feet of soil cover is present over the layer of solid waste material. These soils will be stockpiled and reused for backfill upon removal of the solid waste. Additional backfill will be provided to restore existing grades, and the area will be regraded and seeded. Based on groundwater monitoring and leachate controls in the adjacent SWMU 6, groundwater is not expected to be encountered during the proposed excavation activities.

This excavation work plan is organized as follows:

- Site Description.
- Construction Sequence.
- Site Health and Safety Plan.
- Site Preparation.
- Evaluation of Potential Permitting Obligations.
- Soil Erosion and Sediment Control / Stormwater Management.
- Soil Excavation and Excavated Soil Management.
- Soil Screening.
- Soil Disposal, Staging and Loadout.
- Storm Water Runoff and Leachate Control.
- Site Restoration.
- Quality Assurance and Quality Control.

2. SITE DESCRIPTION

The North Sanitary Landfill was operated from 1976 through 1981 for disposal of solid waste and is equipped with a gas monitoring system and a leachate collection system that was installed as part of ESOI's presumptive correction action activities. The proposed excavation area encompasses the portion of the waste material that extends north of the NSL and the property line, as shown in **Drawing 2**. This area is bounded by the North Sanitary Landfill (NSL) to the south and the Gradel ditch and the Gradel Landfill (an abandoned landfill) to the north. The Gradel ditch only flows during and following precipitation events towards the west and discharges into Otter Creek downstream of the facility.

3. CONSTRUCTION SEQUENCE

The waste area occupies approximately 830 square feet and is located north of the NSL fence line and property boundary. Prior sampling activities conducted in the RFI has horizontally and vertically delineated the extent of the waste material within the area. These results indicate that the waste material is located at limited intervals between approximately 0 to 12 feet bgs within the excavation area.

Construction activities to remove the identified solid waste and restore the area will take place in the following order:

- Site preparation and identification of the delineated solid waste limits (see **Drawing 2**) using GPS to mark out the limits of excavation.
- Removal of approximately 400 feet of existing fencing within the excavation area as depicted on **Drawing 1**.
- Excavation of the top layer of the existing fill (approximately 3 to 5 feet) by visual segregation from underlying waste material; this cover soil will be stockpiled near the work area for use as backfill/topsoil material.
- Removal of waste material at least to the depths shown on **Drawing 2**. Actual excavation depths and extents will be determined based on field observations as described in **Section 10**.
- Collection of contact water (i.e., stormwater and leachate that may collect within the excavation area) in existing on-site fractionation tanks, as needed, for eventual off-site disposal[1].
- Waste characterization sampling of excavated soils for profiling of the waste for disposal at the on-site active landfill, Cell M, as required by the existing facility RCRA Part B Permit.
- Transport and disposal of solid waste/soils to Cell M.
- Site restoration (backfilling, compacting, regrading, seeding, reinstallation of fencing, removal of soil erosion and sediment control measures).

Note that it is anticipated that several existing explosive gas punch bar locations may be disturbed during the excavation activities. Restoration will be competed for those required by the Explosive Gas Monitoring Plan.

[1] As leachate levels are believed to be maintained below the depth of the excavation, accumulation of water within the excavation is not anticipated. However, the fractionation tanks should be on standby in the event that dewatering is warranted.

4. SITE HEALTH AND SAFETY PLAN

All construction activities shall be conducted in accordance with ESOI's Health and Safety Plan (HASP) that complies with OSHA requirements (40 CFR 1910.120).

5. SITE PREPARATION

Prior to groundbreaking, the delineated solid waste boundary beyond the NSL fence line will be staked via a commercial GPS using the coordinates for the excavation limits as depicted on **Drawing 2**. Minor clearing and grubbing will also be required to access the proposed excavation area.

6. EVALUATION OF POTENTIAL PERMITTING OBLIGATIONS

Based on the location of the excavation area and the nature of the proposed work, Ramboll evaluated the need for wetlands and stormwater discharge permitting. As discussed below, Ramboll has not identified any permitting requirements applicable to the planned activities.

A wetland survey conducted as part of the ecological evaluation during the Phase I activities indicate that the Gradel Ditch and the proposed area of disturbance was not identified as a wetland (ENVIRON and MSG, 2003). Therefore, wetland-related permits will not be required for the proposed excavation work.

The Ohio EPA Construction General Permit for Stormwater Discharges is only required if the proposed area of disturbance for a construction project is greater than one acre. Since the threshold area of disturbance will not be met for the proposed excavation activities, this permit and the development of a Stormwater Pollution Prevention Plan (SWP3) will not be required. Soil erosion and sediment control measures will be implemented in accordance with **Section 7** below and **Drawings 3 and 4**.

7. SOIL EROSION AND SEDIMENT CONTROL / STORMWATER MANAGEMENT

Although construction stormwater discharge permits will not be required for this project, ESOI should, as a best management practice, implement soil erosion and sediment control measures consistent with accepted industry practices and described in the Ohio Department of Natural Resources' Rainwater and Land Development Manual (ODNR, 2006). As shown in **Drawings 3 and 4**, silt fencing will be installed around all active soil remediation, handling and staging areas prior to land disturbance. Upon the completion of all construction activities, these controls will be removed for proper disposal, and the backfilled and compacted area will be stabilized with permanent vegetation. The proposed remedial activities will not alter the site hydrology after site restoration since the excavation area will be restored to the existing grades.

8. SOIL EXCAVATION AND EXCAVATED SOIL MANAGEMENT

After the delineated excavation boundaries have been staked, the fence fabric removed, and soil erosion and sediment control measures installed, excavation activities may begin. Excavation shall take place in two phases: (1) removal of the top layer of clean soil and stockpiling of the clean soil in the designated area as shown in **Drawings 2 and 3**, and (2) excavation of solid waste material to the depth and extent as shown in **Drawings 2 and 3**.

All excavated soils will be screened, segregated, and staged as summarized in **Section 9**. As such, these soils will be managed based on: (1) screening observations of soil quality made at the time the soils are exposed and disturbed, and (2) existing analytical results. Excavation shall take place one (1) foot beyond the vertical and horizontal footprint of the observed solid waste based on the soil screening described in **Section 9**.

Unless field observations identify materials that appear contaminated or are present outside the pre-delineated area, post-excavation sampling and sampling of the segregated top soil layer will be unnecessary because prior soil and solid waste sampling results in and near the excavation area did not indicate any exceedances of any applicable screening criteria (ENVIRON, 2008).

9. SOIL SCREENING

Although the vertical and horizontal extents targeted for solid waste removal and the thickness of the topsoil layer to be segregated and reused as backfill were previously characterized, soils exposed during excavation will be screened using field observation as noted below to identify any additional soils that have evidence of potential contamination and therefore require segregation and characterization to determine ultimate disposition. Based on prior investigations performed at the site, however, contaminated materials are not expected.

- Visual Inspection: Soils will be visually inspected for evidence of potential contamination or obvious solid waste materials, particularly the presence of soil staining or free product. ESOI will proceed conservatively with disposal of any stained soil regardless of the actual constituent concentrations identified in those soils.
- Olfactory Screening: Soils will be evaluated for unusual odors. Any soils exhibiting odors shall be segregated for possible waste characterization in accordance with the disposal requirements for Cell M at the discretion of appropriate facility representatives.

During the excavation activities, soils will be screened with a photo-ionization detector (PID) for worker health and safety monitoring purposes. Soils that result in elevated PID readings (sustained readings within the breathing zone of 0.5 ppm above background) shall be segregated for possible further characterization as discussed above. In addition, as part of the worker health and safety monitoring, soils will also be screened for potential explosive gases using a landfill gas meter.

10. SOIL DISPOSAL, STAGING, AND LOADOUT

Excavated material not within the top layer of clean material (see **Section 1**) will be disposed of at the on-site active landfill, Cell M (see **Drawing 1**). Excavated solid waste material shall be directly loaded onto dump trucks and transported to Cell M for waste classification, if required, and disposal. At the discretion of appropriate facility representatives, samples of solid waste materials will be analyzed for waste classification in accordance with the requirements of the facility's RCRA Part B Permit.

Soil staging piles for clean material identified in **Drawing 2** will be covered with a double thickness of 8-mil plastic sheeting. The plastic sheeting covering each soil pile will be secured when the staging area is in active use. The soil piles will also be surrounded by hay bales for erosion control. Alternatively, the clean material may be staged in roll-off containers.

11. STORM WATER RUNOFF AND LEACHATE CONTROL

A recovery well system installed for leachate control has been operational in SWMU 6 since July 1, 2007. Additional piezometers were also installed along the NSL's northern and eastern property lines and on the south slope of the Gradel Landfill to monitor water levels. Based on existing groundwater and leachate levels, the presence of leachate and groundwater is not expected to be a significant.

Contact water (any storm water and leachate that accumulates within the excavation area), if any, shall be managed within the excavation by pumping to an existing on-site fractionation tank for eventual off-site disposal, as needed.

12. SECURITY

ESOI will remove the fencing along the impacted area on a daily basis. At the end of each working day, temporary fencing will be installed to maintain security. Upon completion of all work the permanent fence will be reinstalled.

13. SITE RESTORATION

ESOI will restore excavation areas through backfilling, compacting, and regrading existing site soils and with clean fill from its clay mine stock pile. The backfill material shall be compacted to a minimum of 95% of the Modified Proctor dry density. Soil vegetation shall be restored over the backfilled area using the specifications outlined on **Drawing 4**.

14. QUALITY ASSURANCE AND QUALITY CONTROL

A designated field engineer shall be present during all earthmoving activities to screen soils, track material handling and disposal, and verify and document that all remedial work (i.e., excavation, regrading, topsoiling, and seeding) are completed in accordance with this excavation plan. Additionally, a field engineer shall track all soils loaded and transported to Cell M and inspect the adequacy of soil erosion and sediment control measures. The field engineer shall also monitor dust levels and record observances in the daily field log.

15. REFERENCES

ENVIRON International Corporation (ENVIRON) and Mannik & Smith Group (MSG). 2003. *RFI Phase I Report and Phase II Work Plan*. July.

ENVIRON International Corporation (ENVIRON). 2008. *Resource Conservation and Recovery Act (RCRA) Facility Investigation Final Report*. February.

ENVIRON International Corporation (ENVIRON) and Envirosource Technologies, Inc. Revised 2012. *Corrective Measures Study (CMS)*. January. April.

Midwest Environmental Consultants (MEC). 1997. *Draft Final RFI Report, Northern Sanitary Landfill*. June.

Ohio Department of Natural Resources. Division of Soil and Water Resources. "Rainwater and Land Development Manual: Ohio's Standards for Stormwater Management, Land Development and Urban Stream Protection." By John Mathews. Dec. 2006.

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DRAWINGS

MILLARD LANDFILL SWMU 5

CELL F SWMU 1

NORTHERN SANITARY LANDFILL SWMU 6

CENTRAL SANITARY LANDFILL SWMU 7

CELL H SWMU 3

FORMER SCALE AREA AOC 11

OILY WASTE ABOVEGROUND STORAGE TANKS AOC 6

NEW OIL POND SWMU 9

ESTIMATED FORMER ASH DISPOSAL AREA SWMU 10

CELL G SWMU 2

FORMER TEEPEE BURNER SWMU 11

STAGING AREA AOC 8

DECONTAMINATION BUILDING AOC 5

CELL I SWMU 4

AOC 1

MAINTENANCE/STORAGE BUILDING "C" AOC 3

OLD OIL POND SWMU 8

TRUCK SCALES AOC 2

BUILDING "C" SEPTIC TANK AND LEACHATE FIELD AOC 4

BUTZ CROCK AOC 7

CELL "M" PHASE 1

CELL "M" PHASE 2

CELL "M" SURFACE WATER RETENTION BASIN AOC 9

RAIL SPUR AOC 10

CELL "M" PHASE 3

FORMER BILL'S ROAD OIL OPERATION SWMU 12

N

LEGEND

- PROPERTY LINE
- EXISTING FENCE
- SOLID WASTE MANAGEMENT UNIT
- REVISED LIMIT OF SOLID WASTE MANAGEMENT UNIT BASED ON RFI PHASE I

DRAFT

160 0 160 320

SCALE IN FEET

REV.	DATE	DR.	CH.	REVISION

FACILITY LAYOUT

ENVIROSAFE SERVICES OF OHIO, INC.
OTTER CREEK ROAD FACILITY
OREGON, OHIO

RAMBOLL ENVIRON

PREPARED BY: JY	DATE: 10/13/2015	DRAWING 1
DRAFTED BY: PRM/MSB	SCALE: 1" = 160'	
APPROVED BY: CB	PROJECT: 026174M14A	

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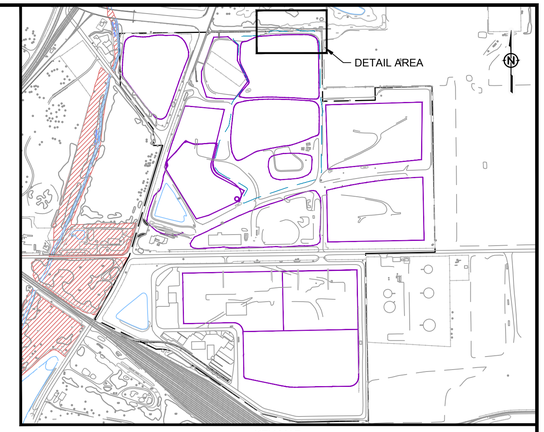

KEY MAP
1" = 400'

PROPOSED WASTE EXCAVATION LIMIT

PROPOSED WASTE EXCAVATION LIMIT

WESTERN BOUND OF FENCE REMOVAL

EASTERN BOUND OF FENCE REMOVAL

GRADEL DITCH (APPROXIMATE LOCATION)

BRUSH

BRUSH

B

EXISTING ACCESS ROAD

EXISTING ACCESS ROAD

NORTHERN SANITARY LANDFILL
SWMU 6

GR-7(PIEZ)
GR-5(PIEZ)
GR-4(PIEZ)
GR-4S(WELL)
GR-3.75
GR-3(PIEZ)
GR-2(PIEZ)
GR-1(PIEZ)
QD-8
QD-7B
QD-7(PIEZ)
QD-6.5B
QD-6.5
QD-6C
QD-6B
QD-6
QD-5E
QD-5S(WELL)
QD-5C
QD-5B
QD-5D(WELL)
QD-4I
QD-4E
QD-4H
QD-4D(WELL)
QD-4D
QD-4C
QD-4B
QD-4A
Waste: 5.0'–5.4'bgs
QD-4
Waste: 5.0'–6.5'bgs
QD-4F
Waste: 8.0'–9.0'bgs
QD-3.75C
QD-3.75B
QD-3.75
QD-3.5BB
Waste: 7.7'–18.0'bgs
QD-3.25E
QD-3.25D
QD-3.25C
QD-3.25B
QD-3.25
QD-3.5E
QD-3.5D
QD-3.5C
QD-3.5B
QD-3.5
QD-3C
Waste: 5.0'–6.8'bgs
QD-3B
Waste: 5.0'–5.5'bgs
QD-3A
Waste: 7.5'–8.2'bgs
QD-3
Waste: 7.0'–8.7'bgs
QD-3H
QD-3I
Waste: 11.6'–12.0'bgs
QD-2.75C
QD-2.75B
Waste: 6.0'–7.0'bgs
QD-2.75
QD-2.5B
Waste: 3.5'–3.75'bgs
QD-2.5C
QD-2.5
QD-2.5CC
QD-2.5BB
QD-2.25
Waste: 7.5'–8.0'bgs
QD-3F
QD-3J
QD-3R(WELL)
QD-3E
QD-3D2
QD-3D(WELL)
QD-3D1
QD-3G
QD-3S(PIEZ)
QD-2.25E
QD-2.25D
QD-2.25C
QD-2D(WELL)
QD-2C
QD-2D
QD-2S(WELL)
QD-2B
Waste: 9.5'–10.1'bgs
QD-2A
Waste: 7.7'–10.7'bgs
QD-2
Waste: 3.3'–3.4'/7.7'–9.1'bgs
QD-2.25B
Waste: 0.0'–12.0'bgs
QD-1.5B
QD-1.5
QD-1S(WELL)
QD-1C
QD-1B
QD-1D
QD-1D(WELL)
QD-1A
Waste: 4.4'–5.0'bgs
QD-1
Waste: 4.7'–5.0'bgs
QE-0.0
QE-40
QE-80BB(PIEZ)
QE-80(PIEZ)
QE-80B(PIEZ)
QE-120
QE-140
QE-160BB(PIEZ)
QE-160(PIEZ)
QE-160B
QE-160C(PIEZ)
QE-180
QE-200CC(PIEZ)
QE-200B(PIEZ)
QE-200(PIEZ)
QE-200BB(PIEZ)
QD-5A
Waste: 2.3'–3.1'bgs
QD-5D
QD-5.25BB(PIEZ)
QD-5.25CC
Waste: 6.0'–8.0bgs

LEGEND

- PROPERTY LINE
- EXISTING FENCE
- NSL RFI BORING AND PIEZOMETER LOCATIONS - 1996/1997 (NO WASTE IDENTIFIED)
- NSL RFI BORING AND PIEZOMETER LOCATIONS - 1996/1997 (WASTE IDENTIFIED)
- SOLID WASTE MANAGEMENT UNIT
- REVISED LIMIT OF SOLID WASTE MANAGEMENT UNIT BASED ON RFI PHASE I
- AREA OF OFF-SITE WASTE
- PROPOSED WASTE EXCAVTION LIMIT LINE

VOLUME OF WASTE OUTSIDE FENCE

ESTIMATED 200 C.Y.

CAP VOLUME: ESTIMATED 110 C.Y.

FENCE REMOVAL = 400ft.

DRAFT

20 0 20 40
SCALE IN FEET

REV.	DATE	DR.	CH.	REVISION

EXCAVATION MAP

ENVIROSAFE SERVICES OF OHIO, INC.
OTTER CREEK ROAD FACILITY
OREGON, OHIO

RAMBOLL ENVIRON

PREPARED BY: JY	DATE: 10/13/2015	DRAWING 2
DRAFTED BY: PRM/MSB	SCALE: 1" = 20'	
APPROVED BY: CB	PROJECT: 026174M14A	

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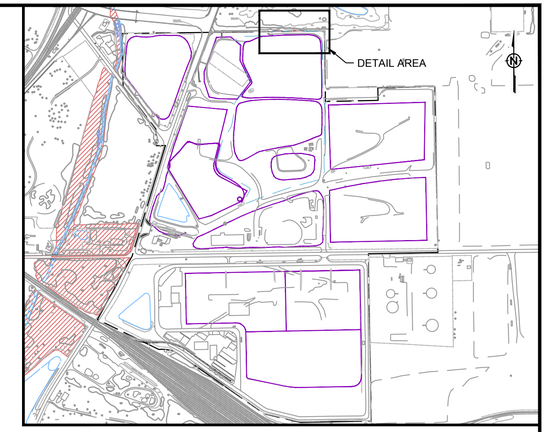

KEY MAP
1" = 400'

PROPOSED WASTE EXCAVATION LIMIT

WESTERN BOUND OF FENCE REMOVAL

PROPOSED WASTE EXCAVATION LIMIT

REINFORCED SILT FENCE

EASTERN BOUND OF FENCE REMOVAL

GRADEL DITCH (APPROXIMATE LOCATION)

BRUSH

EXISTING ACCESS ROAD

PROPOSED STAGING AREA (APPROXIMATE - MAY BE RELOCATED TO MEET OPERATIONAL NEEDS)

NORTHERN SANITARY LANDFILL SWMU 6

GR-7(PIEZ)
GR-5(PIEZ)
GR-4(PIEZ)
GR-3.75
GR-3(PIEZ)
GR-2(PIEZ)
GR-1(PIEZ)
QD-8
QD-7B
QD-7(PIEZ)
QD-7
QD-6.5B
QD-6C
QD-6B
QD-6
QD-5E
QD-5S(WELL)
QD-5C
QD-5B
QD-5D(WELL)
QD-4S(WELL)
QD-4I
QD-4E
QD-4H
QD-4D(WELL)
QD-4D
QD-4C
QD-4B
QD-3.75C
QD-3.75B
QD-3.75
QD-3.25E
QD-3.25D
QD-3.25C
QD-3.25B
QD-3.25
QD-3.5E
QD-3.5D
QD-3.5C
QD-3.5
QD-3.5B
QD-3F
QD-3J
QD-3R(WELL)
QD-3E
QD-3D2
QD-3D(WELL)
QD-3D1
QD-3G
QD-3S(PIEZ)
QD-2.25E
QD-2.25D
QD-2.25C
QD-2.25
QD-2D(WELL)
QD-2C
QD-2
QD-2S(WELL)
QD-1.5B
QD-1.5
QD-1S(WELL)
QD-1C
QD-1B
QD-1D(WELL)
QD-1
QE-0.0
QD-4A
Waste: 5.0'–5.4'bgs
QD-4
Waste: 5.0'–6.5'bgs
QD-4F
Waste: 8.0'–9.0'bgs
QD-3.5BB
Waste: 7.7'–18.0'bgs
QD-3C
Waste: 5.0'–6.8'bgs
QD-3B
Waste: 5.0'–5.5'bgs
QD-3A
Waste: 7.5'–8.2'bgs
QD-3
Waste: 7.0'–8.7'bgs
QD-3H
QD-3I
Waste: 11.6'–12.0'bgs
QD-2.75C
QD-2.75B
Waste: 6.0'–7.0'bgs
QD-2.75
QD-2.5B
Waste: 3.5'–3.75'bgs
QD-2.5C
QD-2.5
QD-2.5CC
QD-2.5BB
QD-2.25
Waste: 7.5'–8.0'bgs
QD-2B
Waste: 9.5'–10.1'bgs
QD-2A
Waste: 7.7'–10.7'bgs
QD-2
Waste: 3.3'–3.4'/7.7'–9.1'bgs
QD-2.25B
Waste: 0.0'–12.0'bgs
QD-1A
Waste: 4.4'–5.0'bgs
QD-1
Waste: 4.7'–5.0'bgs
QD-5A
Waste: 2.3'–3.1'bgs
QD-5D
QD-5.25BB(PIEZ)
QD-5.25CC
Waste: 6.0'–8.0bgs
QE-40
QE-80BB(PIEZ)
QE-80(PIEZ)
QE-80B(PIEZ)
QE-120
QE-140
QE-160BB(PIEZ)
QE-160(PIEZ)
QE-160B
QE-160C(PIEZ)
QE-180
QE-200CC(PIEZ)
QE-200B(PIEZ)
QE-200(PIEZ)
QE-200BB(PIEZ)

LEGEND
- PROPERTY LINE
- EXISTING FENCE
- NSL RFI BORING AND PIEZOMETER LOCATIONS - 1996/1997 (NO WASTE IDENTIFIED)
- NSL RFI BORING AND PIEZOMETER LOCATIONS - 1996/1997 (WASTE IDENTIFIED)
- SOLID WASTE MANAGEMENT UNIT
- REVISED LIMIT OF SOLID WASTE MANAGEMENT UNIT BASED ON RFI PHASE I
- AREA OF OFF-SITE WASTE
- PROPOSED WASTE EXCAVTION LIMIT LINE
- REINFORCED SILT FENCE

NOTE:

THE REINFORCED SILT FENCING ALIGNMENT SHOWN IS ONLY APPROXIMATE AND SHALL BE FIELD-VERIFIED TO MINIMIZE CLEARING AND GRUBBING AND TO FOLLOW THE SPECIFICATIONS IN DETAIL 1.

DRAFT

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SCALE IN FEET

REV.	DATE	DR.	CH.	REVISION

SOIL EROSION AND SEDIMENT CONTROL

ENVIROSAFE SERVICES OF OHIO, INC.
OTTER CREEK ROAD FACILITY
OREGON, OHIO

RAMBOLL

PREPARED BY: JY/JMN	DATE: 09/26/2018	DRAWING
DRAFTED BY: PM/MB/DB	SCALE: 1" = 20'	3
APPROVED BY: CB/JMN	PROJECT: 1690001206	

DBLANCHARD 9/26/18
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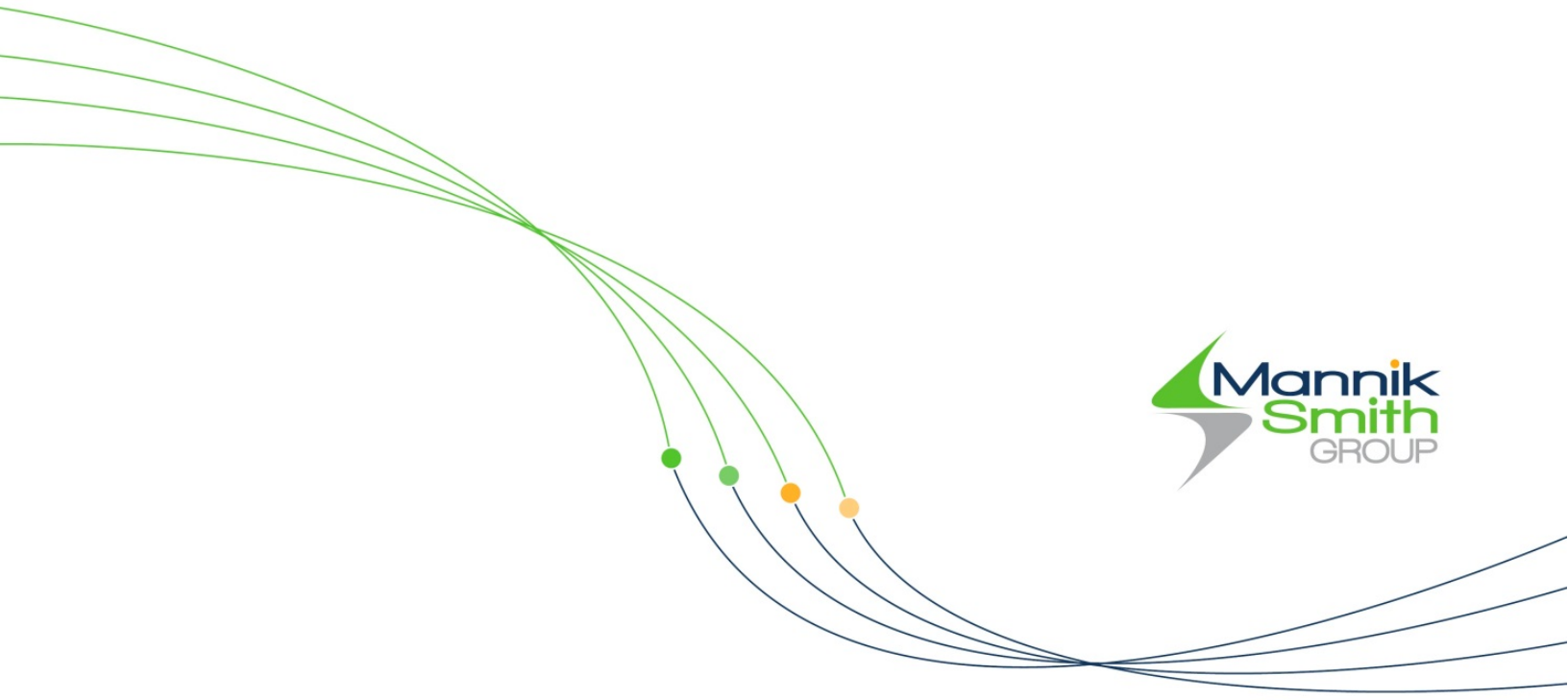
SWMU 8 OLD OIL POND



1.1 Basis of Design

The purpose of this design analysis is to develop a plan to manage the conditions identified at SWMU 8, the old oil pond, that require corrective measures. During the RFI it was determined that landfill gas was forming and collecting in the solid waste management unit and that the pressure from this gas was causing the seepage of a tar-like NAPL to the surface. Additionally leachate is accumulating in SWMU 8 and has the potential to move laterally. In the CMS Report two corrective measure options were analyzed to address these concerns. In-place containment was the chosen remedy and the design considerations included the following criteria:

- Repair existing cap at seep locations
  Areas that exhibited surface seeps of NAPL during the RFI will be investigated and addressed by either excavation of the affected area and placement of clay back into the seep, or the regrading that is to occur in order to promote positive drainage from the area may be sufficient to "re-cap" these seep areas.

- Landfill gas venting
  During the RFI it was noted that landfill gas was being generated and collecting within SWMU 8. There is evidence to suggest that the gas pressure being generated was increasing the potential for the NAPL surface outbreaks. In order to alleviate the gas pressure passive vents will be installed within the lateral limits of SWMU 8.

- Leachate and NAPL recovery
  To alleviate the potential for surface seeps and any subsurface lateral migration, leachate recovery wells will be installed within the lateral limits of SWMU 8. Leachate removal will focus on controlling migration of the accumulated liquid to maintain acceptable risk criteria.

- An enhanced barrier
  In order to accentuate the existing low permeability soils, sheet pile will be installed below ground surface, keying into the existing upper till clay unit. The gas and leachate recovery wells will be used to maintain the liquid levels inside the barrier.

- Additional work to be incurred on SWMU 8
  Building C (AOC 5) will be removed in order to facilitate cap enhancement over SWMU 8. A replacement structure for Building C will be located elsewhere at the facility.
  Butz Crock (AOC 7) will be treated similarly to the noted surface seeps within SWMU 8. The crock and associated piping will be removed and backfilled with cement or other appropriate flowable fill.

  Building C Heating Oil Tank (AOC 12) will be closed in place. Any liquids found within the tank will be removed and properly recycled or disposed. The tank will then be filled with cement or cement slurry to ensure that the tank does not collapse and lead to subsidence in this area. A portion or the entire tank may be removed and properly recycled or disposed if it impedes installation of the sheet pile wall.

1.2 Development of Design

- Cap repair and enhancement

  The existing cap will be repaired in the areas of NAPL surface seeps. These repairs will consist of excavating the seep area to try and identify the source. If the source can be identified an attempt to remove it will be made. After the area has been excavated soil will be placed and compacted to seal off the seep. Additional grading will be completed in accordance with the final grading plan to ensure that positive drainage off SWMU 8 is maintained.

  An existing conditions survey will be completed to facilitate the final grading plan. The final grade will take the sheet pile wall into account so that positive drainage is maintained while ensuring that the sheets are appropriately covered.

- Landfill Gas Management and Leachate Removal

  The passive gas vents and leachate recovery wells are to be installed as dual purpose structures. The dual purpose structure will be designed to vent landfill gas and remove leachate from the unit from a single boring. The final recovery well/gas vent locations are based on historical information. Any revision to these locations based on conditions encountered in the field will be noted in the as-built report.

  The recovery wells/gas vents will be installed in a staged manner. Recovery well/gas vents C and D will be installed first and monitored for 12 months prior to the next two extraction points being installed. The intent of installing the wells/vents in this phased manner is to determine the effectiveness of the well design, extraction equipment, and what level of extraction/venting is necessary. Should less than five extraction points accomplish the corrective action goal of eliminating surface seeps, the remaining points will not be installed.

  Liquid within SWMU 8 was assessed using historical aerial photographs, historical data, and data at the time of installation from T-42S, T-54S and G-4S or their replacements. Based on the information gathered, during installation, appropriate performance objectives will be established and detailed in the operations and maintenance plan submitted with the as-built report.

  The attached plan sheets contain a typical detail for the construction of the recovery well/ gas vents. This detail is intended to be flexible in the materials used for construction of the wells depending on the field conditions encountered during installation. Because the intent of the wells will be NAPL recovery, the granular backfill used to fill the annular space may be a larger pea gravel. This would allow for the NAPL to recharge faster but the intended extraction rate is slow enough that clogging would not be expected. However, field conditions may necessitate a finer granular material and if that is the case a different

material will be installed. Each recovery well/gas vent will be documented in the as-built report along with any rational for alternate designs.

- Installation of Sheet Pile Wall

  The location for the sheet pile wall was determined based on an existing conditions survey. The goal remains to install the wall as close to the lateral limits of SWMU 8 as possible. Some factors that may impact the location of the wall are the water line easement (the wall will stay outside of the City of Toledo's water line easement) and any underground structures that are encountered during installation. The final wall location will be shown on as built plans.

  The sheet pile sections will be installed using a pushing method rather than pounding them into the ground as much as possible. The upper clay till should be an easy media to facilitate pushing the panels. Should obstacles (rocks) be encountered some pounding may be necessary.

- Demolition of Building C, the heating oil tank and Butz Crock

  Building C is to be demolished. A replacement building will be constructed across York Street closer to the Cell M operations. The existing concrete slab that building C currently sits on will be left in place. The final grading of SWMU 8 takes this into account and provides for 1.5 to 2 feet of soil over the slab.

  The heating oil tank (AOC 12) located on the south side of Building C will be abandoned in place. Any remaining liquid in the tank will be removed and properly recycled or disposed. The tank will then be filled with a cement, cement slurry or other appropriate flowable fill to ensure that the tank does not collapse and lead to subsidence.

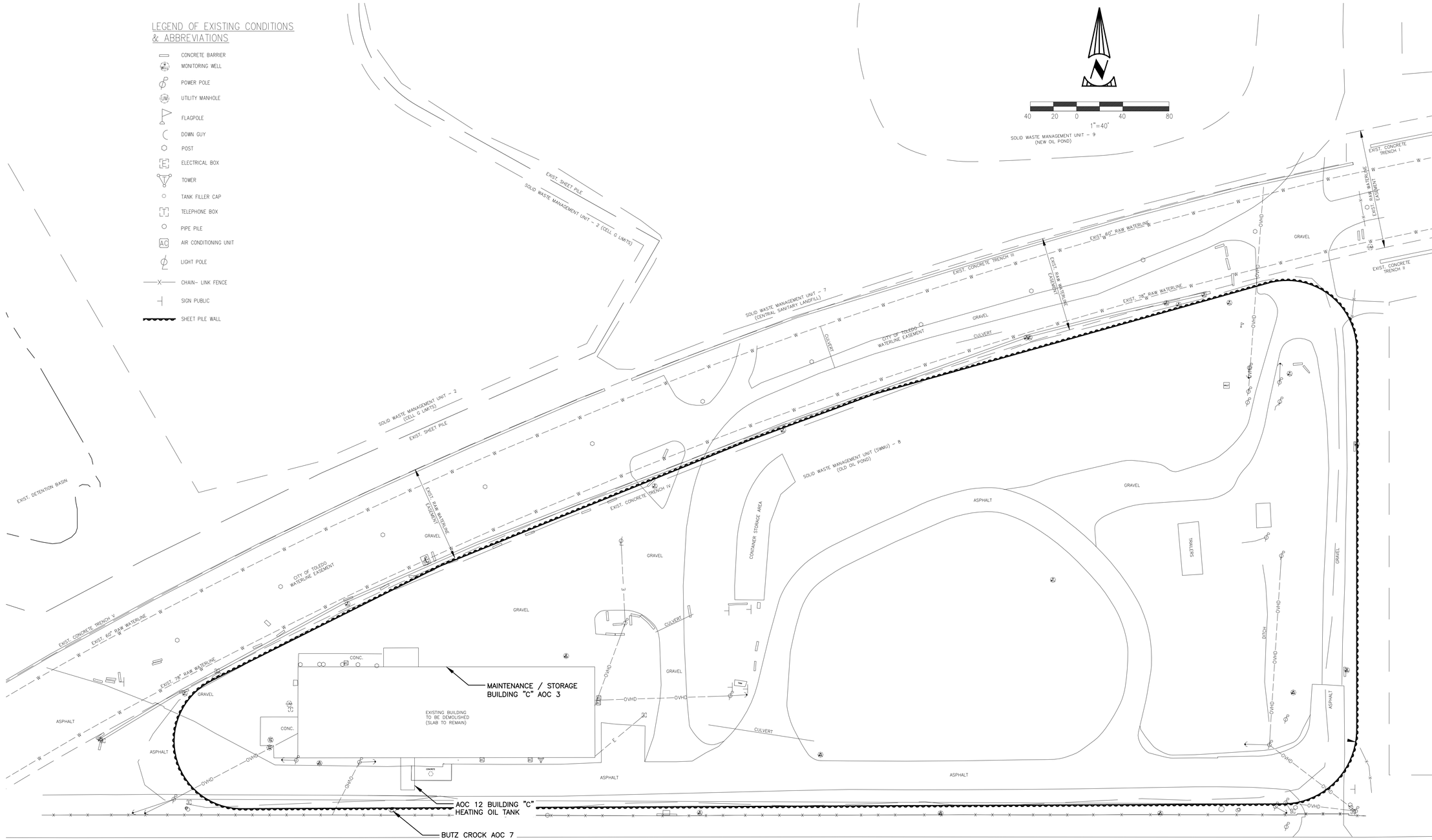
  Butz Crock (AOC 7) will be closed place. Any liquids found in the crock will be removed and properly disposed. The crock will then be filled with cement, cement slurry or other appropriate flowable fill to prevent subsidence in the area and to blind off any potential pathways. The flowable fill will also fill the associated piping to the degree possible.

  Similarly, other any other units encountered within SWMU 8 such as the septic tank associated with AOC 4, the two waste water tanks associated with AOC 5, the second utility vault, will also be abandoned in place using the same methods.

Plan Sheet Set
Sheet Pile Wall location and Details
Grading Plan
Recovery Wells/Gas Vent Locations and Details
Surface Water Improvements

LEGEND OF EXISTING CONDITIONS & ABBREVIATIONS

- CONCRETE BARRIER
- MONITORING WELL
- POWER POLE
- UTILITY MANHOLE
- FLAGPOLE
- DOWN GUY
- POST
- ELECTRICAL BOX
- TOWER
- TANK FILLER CAP
- TELEPHONE BOX
- PIPE PILE
- AIR CONDITIONING UNIT
- LIGHT POLE
- CHAIN- LINK FENCE
- SIGN PUBLIC
- SHEET PILE WALL



GENERAL NOTES:

1. CAP REPAIR & ENHANCEMENT
   THE EXISTING CAP WILL BE REPAIRED IN THE AREAS OF SURFACE SEEPS. THESE REPAIRS WILL CONSIST OF EXCAVATING THE SEEP AREA TO TRY & IDENTIFY THE SOURCE. IF THE SOURCE CAN BE IDENTIFIED AN ATTEMPT TO REMOVE IT WILL BE MADE. AFTER THE AREA HAS BEEN EXCAVATED STONE MAY BE PLACED TO ALLOW LIQUID TO DRAIN BACK DOWN INTO THE WASTE UNIT & OR SOIL WILL BE PLACED & COMPACTED TO SEAL OFF THE SEEP.
   ADDITIONAL GRADING WILL BE COMPLETED IN ACCORDANCE WITH THE FINAL GRADING PLAN TO ENSURE THAT POSITIVE DRAINAGE IS MAINTAINED. (SEE SHEET 2/5)
2. LANDFILL GAS & LEACHATE MANAGEMENT
   LIQUID WITHIN SWMU 8 WILL BE ASSESSED USING HISTORICAL AERIAL PHOTOGRAPHS, HISTORICAL DATA, & DATA AT THE TIME OF INSTALLATION FROM T-42S, T-54S & G-4S OR THEIR REPLACEMENTS. BASED ON THE INFORMATION GATHERED, APPROPRIATE PERFORMANCE OBJECTIVES WILL BE ESTABLISHED. LOCATIONS & NUMBER OF WELLS WILL BE DETERMINED BASED ON THE LOCATION & FOOTPRINT OF HISTORICAL OPERATIONS & CONDITIONS ENCOUNTERED DURING INSTALLATION.
   PASSIVE LANDFILL GAS VENTS ARE TO BE INSTALLED TO RELIEVE PRESSURE IN THE UNIT THAT APPEARS TO BE CAUSING SURFACE SEEPS. (SEE SHEET 4/5)
   LEACHATE RECOVERY WELLS ARE TO INSTALLED TO COLLECT NON-AQUEOUS PHASE LIQUIDS (NAPL) IN AN EFFORT TO MINIMIZE THE OCCURRENCE OF SURFACE SEEPS. (SEE SHEET 4/5)
3. INSTALLATION OF SHEET PILE WALL
   THE LOCATION FOR THE SHEET PILE HAS BEEN DETERMINED BASED ON THE CURRENT LIMIT OF WASTE PLACEMENT FOR SWMU 8. THE GOAL WILL BE TO INSTALL THE WALL AS CLOSE TO THE LATERAL LIMITS OF SWMU 8 AS POSSIBLE. SOME FACTORS THAT MAY IMPACT THE LOCATION OF THE WALL ARE THE WATER LINE EASEMENT (THE WALL WILL STAY OUTSIDE OF THE CITY OF TOLEDO'S WATER LINE EASEMENT) & ANY UNDERGROUND STRUCTURES THAT ARE ENCOUNTERED DURING INSTALLATION. (SEE SHEET 3/5 FOR DETAILS) THE FINAL WALL LOCATION WILL BE SHOWN ON AS BUILT PLANS.
4. BUTZ CROCK (AOC 7) WILL CLOSED IN PLACE. ANY LIQUIDS FOUND WITHIN THE CROCK WILL BE REMOVED & PROPERLY RECYCLED OR DISPOSED. THE CROCK WILL THEN BE FILLED WITH CEMENT OR CEMENT SLURRY TO PREVENT SUBSIDENCE IN THIS AREA & TO BLIND OFF ANY POTENTIAL PATHWAYS. THE CEMENT SLURRY WILL ALSO FILL THE ASSOCIATED PIPING TO THE DEGREE POSSIBLE.
5. BUILDING C HEATING OIL TANK (AOC 12) TO BE CLOSED IN PLACE. ANY LIQUIDS FOUND WITHIN THE TANK WILL BE REMOVED & PROPERLY RECYCLED OR DISPOSED. THE TANK WILL THEN BE FILLED WITH CEMENT OR CEMENT SLURRY TO ENSURE THAT THE TANK DOES NOT COLLAPSE & LEAD TO SUBSIDENCE IN THIS AREA.
6. BUILDING "C" TO BE DEMOLISHED. CONCRETE SLAB TO REMAIN.

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SITE LAYOUT

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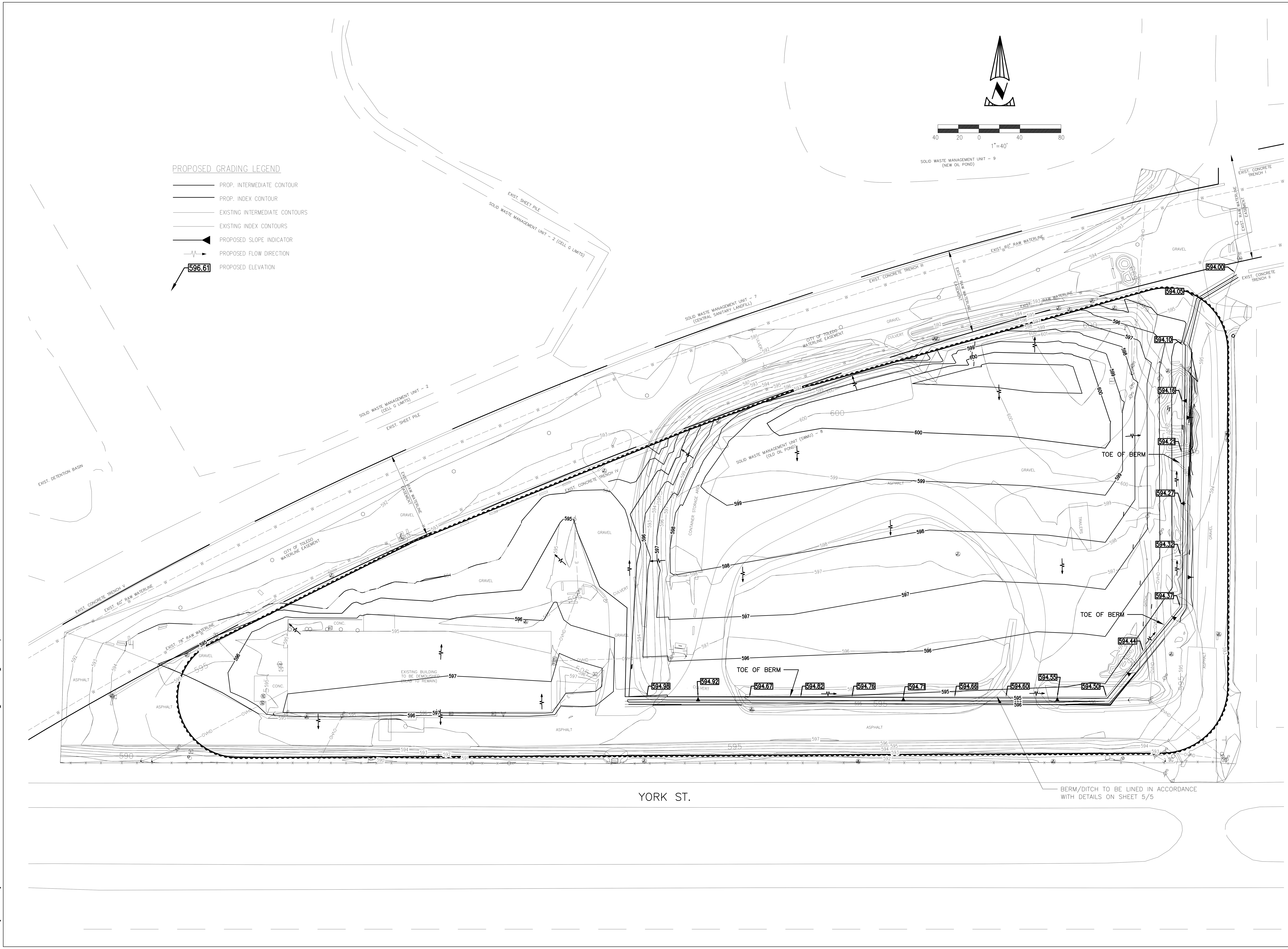

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GRADING PLAN

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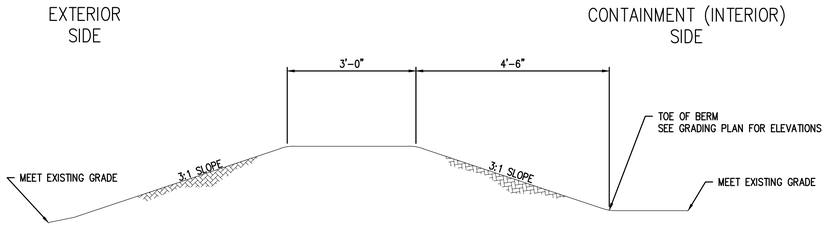
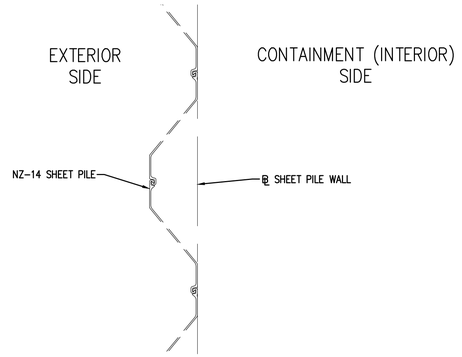
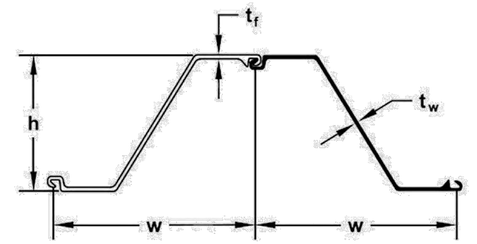


TYPICAL SECTION THRU
BERM
NTS

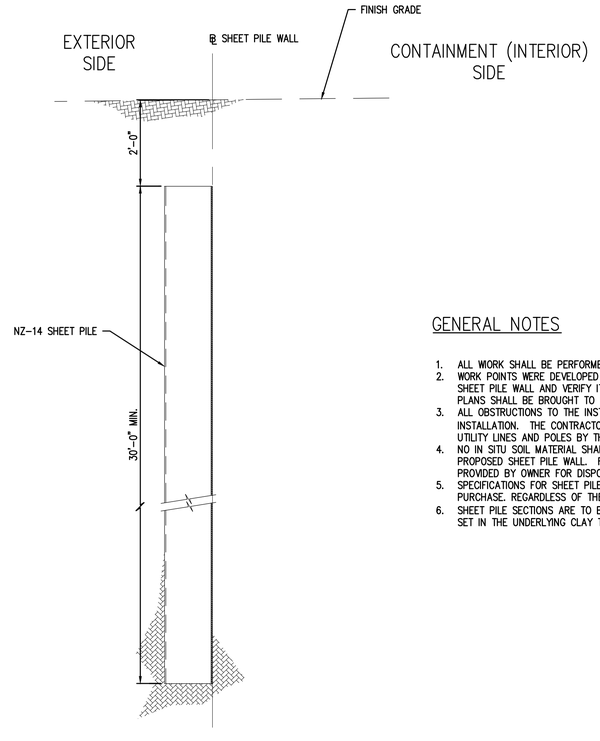


PLAN VIEW OF
SHEET PILE WALL
NTS

NZ14 (Hot rolled sheet piles)



SECTION DESCRIPTION	PRODUCT GROUP	SHAPE	WIDTH	HEIGHT	THICKNESS FLANGE	THICKNESS WEB
			(INCH)	(INCH)	(INCH)	(INCH)
NZ14	HOT ROLLED SHEET PILES	Z	30.31	13.39	0.375	0.375



TYPICAL SECTION THRU
SHEET PILE WALL
NTS

GENERAL NOTES

1. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE, AND LOCAL CODES AND REGULATIONS.
2. WORK POINTS WERE DEVELOPED FROM AVAILABLE SURVEY INFORMATION. THE CONTRACTOR SHALL LOCATE THE PROPOSED SHEET PILE WALL AND VERIFY ITS ALIGNMENT PRIOR TO THE START OF CONSTRUCTION. ANY DISCREPENCIES WITH THESE PLANS SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER PRIOR TO THE START OF CONSTRUCTION.
3. ALL OBSTRUCTIONS TO THE INSTALLATION OF THE PROPOSED SHEET PILE SHALL BE REMOVED PRIOR TO SHEET PILE INSTALLATION. THE CONTRACTOR SHALL COORDINATE THE WORK WITH THE REMOVAL AND/OR RE-ROUTING OF OVERHEAD UTILITY LINES AND POLES BY THE AFFECTED UTILITY.
4. NO IN SITU SOIL MATERIAL SHALL BE REMOVED FROM THE SITE, OR TO ANY LOCATION OUTSIDE THE PERIMETER OF THE PROPOSED SHEET PILE WALL. REMOVED OBSTRUCTIONS AND CONSTRUCTION DEBRIS SHALL BE PLACED IN CONTAINERS PROVIDED BY OWNER FOR DISPOSAL BY OWNER, AND SHALL BE PROPERLY DISPOSED.
5. SPECIFICATIONS FOR SHEET PILE WITH MAY VARY FROM WHAT IS SHOWN BASED ON AVAILABILITY AT THE TIME OF PURCHASE. REGARDLESS OF THE SECTION SHAPE, SWMV 8 WILL BE CONTAINED AS INDICATED.
6. SHEET PILE SECTIONS ARE TO BE A MINIMUM OF 30' IN LENGTH. THIS WILL ENSURE THAT THE BOTTOM OF THE SHEETS ARE SET IN THE UNDERLYING CLAY TILL.

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GENERAL NOTES & DETAILS

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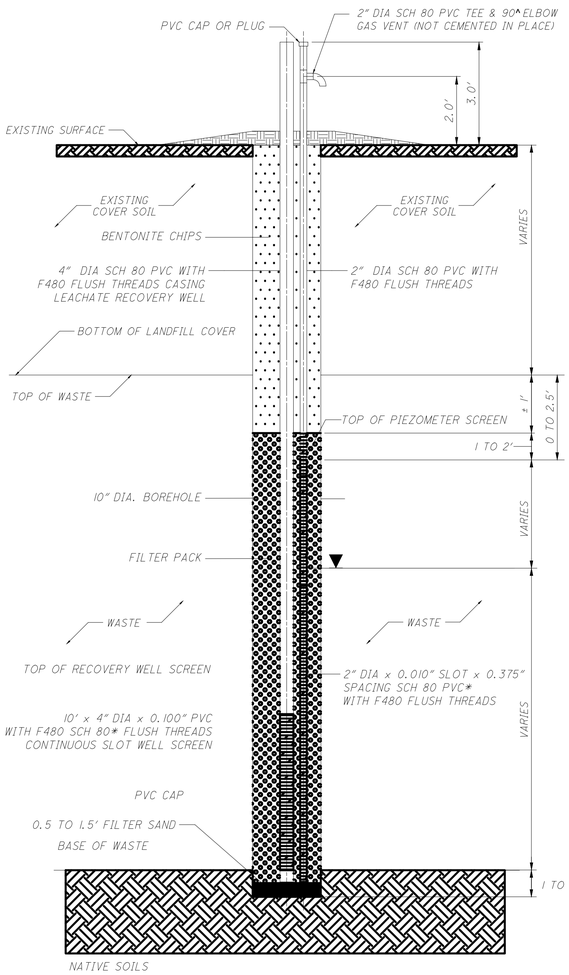


NESTED RECOVERY WELL/GAS VENT DETAIL (TYP.)

SCALE: N.T.S.

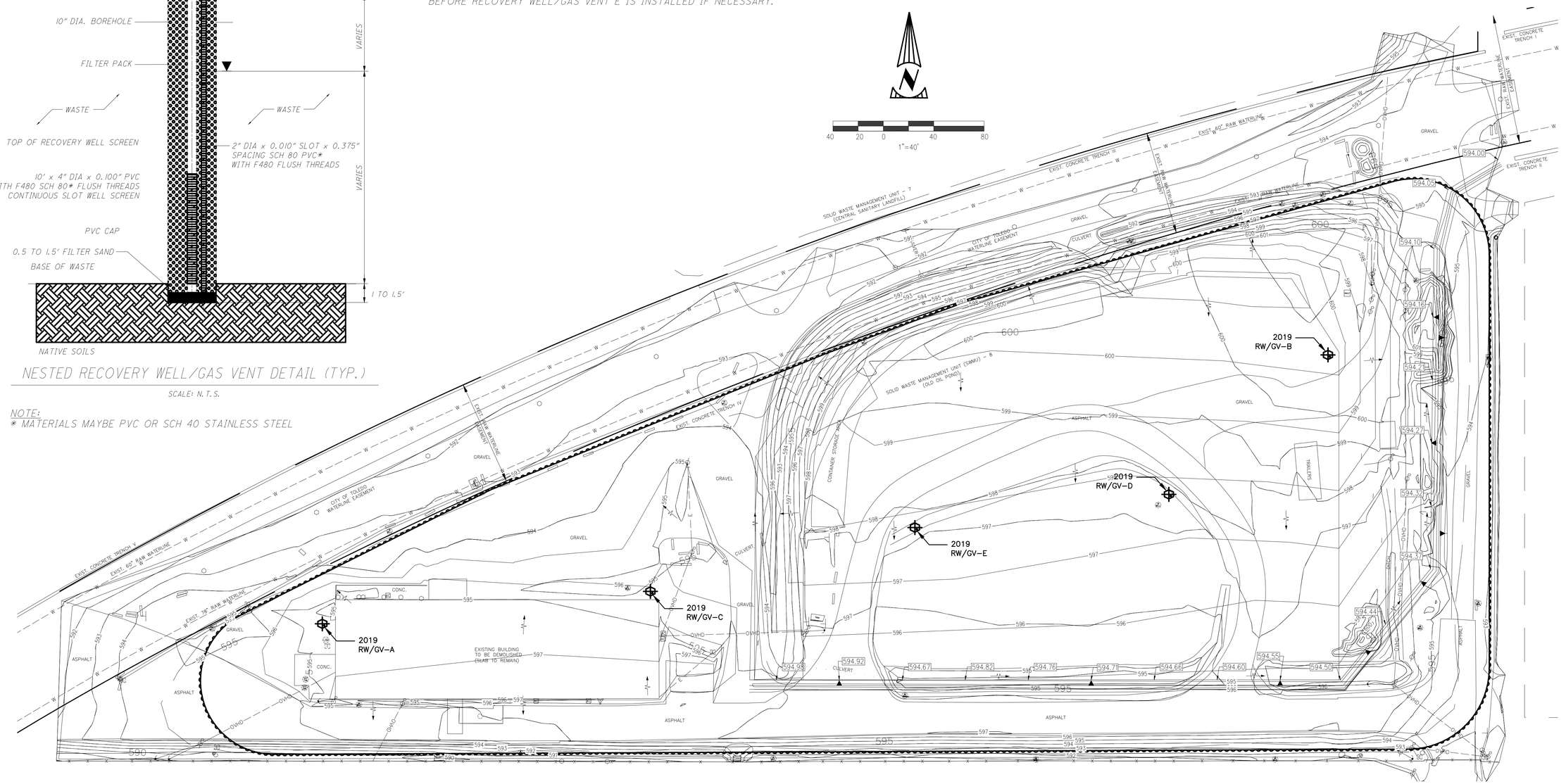
NOTE:
* MATERIALS MAYBE PVC OR SCH 40 STAINLESS STEEL

RECOVERY WELL/GAS VENT SPECIFICATIONS

1. DRILL & INSTALL UP TO FIVE RECOVERY WELL/GAS VENTS AT THE LOCATIONS DEPICTED ON SHEET 4 OF THE SWMU 8 CORRECTIVE ACTION PLAN (SEE NOTE 14).
2. UTILIZE MECHANICAL AUGERING WITH HOLLOW STEM AUGERS FOR OR SONIC DRILLING AS APPROPRIATE FOR INSTALLATION OF THE WELL/GAS VENTS.
3. OWNER'S ENGINEER TO PROVIDE A QUALITY CONTROL REPRESENTATIVE ON SITE DURING DRILLING TO OBSERVE & DOCUMENT THE WORK.
4. DRILL TO WITHIN 10 FEET OF THE ESTIMATED BASE OF WASTE THEN COLLECT CUTTING SAMPLES FOR INSPECTION UNTIL THE BASE OF WASTE IS LOCATED.
5. PLACE 0.5 TO 1.5 FEET OF GRANULAR MATERIAL (TO BE SPECIFIED BY OWNER) TO COVER THE BOTTOM OF THE BOREHOLE. (THE FUNCTION OF THE GRANULAR MATERIAL IS TO PREVENT CLOGGING OF THE SCREEN.)
6. SET THE SCREENS OF THE RECOVERY WELL/GAS VENT ON THE GRANULAR MATERIAL AT THE BOTTOM OF THE HOLE.
7. INSTALL 10 FEET OF RECOVERY WELL SCREEN. INSTALL GAS VENT SCREEN TO EXTEND FROM THE GRANULAR MATERIAL AT THE BOTTOM OF THE HOLE TO WITHIN 0 TO 2.5 FEET OF TOP OF WASTE.
8. INSTALL BENTONITE SEAL ABOVE FILTER PACK TO GROUND SURFACE AS INDICATED IN THE DRAWING. INTRODUCE GRANULAR BENTONITE TO ANNULAR SPACE IN A MANNER THAT ALLOWS EVEN PLACEMENT AROUND RISER. ADD 1 GALLON OF WATER FOR EVERY 6-INCHES OF GRANULAR BENTONITE PLACED.
9. MOUND SOIL AROUND STRUCTURES AS INDICATED ON THE DRAWING TO PROVIDE POSITIVE DRAINAGE.
10. COLLECT DRILL CUTTINGS FOR DISPOSAL. PLACE CUTTINGS IN A PLASTIC LINED ROLL-OFF BOX PROVIDED BY OWNER FOR DISPOSAL BY OWNER.
11. TRANSPORT OR PUMP LIQUIDS ENCOUNTERED DURING DRILLING TO STORAGE TANKS OR TANK TRUCKS PROVIDED BY OWNER FOR DISPOSAL BY OWNER.
12. THE DETAIL PROVIDED IS INTENDED AS A TYPICAL FOR THE FIVE PROPOSED RECOVERY WELL/GAS VENTS. THE FINAL DESIGN WILL BE FIELD FIT BASED ON THE RECOVERY MATERIALS ENCOUNTERED DURING INSTALLATION. FOR EXAMPLE, LARGER PEA GRAVEL MAY BE SPECIFIED FOR THE GRANULAR MATERIAL TO REMOVE NAPL FROM THESE WELLS. THE PEA GRAVEL WOULD ALLOW FOR MORE RECHARGE OF THE NAPL BUT THE RECHARGE RATE IS ANTICIPATED TO BE SLOW ENOUGH TO AVOID DRAWING SEDIMENTS INTO THE WELL. DUAL PURPOSE WELLS MAY ALSO BE USED IF MORE APPROPRIATE THAN THE NESTED RECOVERY WELL AND PIEZOMETER.
13. THE LOCATIONS INDICATED FOR THE RECOVERY WELL/GAS VENTS ARE APPROXIMATE. THE LOCATIONS WERE CHOSEN BASED ON HISTORIC DOCUMENTATION AND THE LOCATION OF THE DEEPEST SECTIONS OF WASTE. FINAL LOCATIONS WILL BE BASED ON FIELD CONDITIONS AND DOCUMENTED IN AN AS-BUILT SUBMITTAL.
14. THE RECOVERY WELL/GAS VENTS WILL BE INSTALLED IN PHASES. THIS APPROACH IS INTENDED TO ENSURE THAT THE RECOVERY WELLS ARE FUNCTIONAL AND PROPERLY LOCATED. DEPICTED ON THE PLAN SHEET RECOVERY WELL/GAS VENT C AND D WILL BE INSTALLED FIRST AND MONITORED FOR 12 MONTHS. ONCE C AND D ARE ESTABLISHED, RECOVERY WELL/GAS VENT A AND B WILL BE INSTALLED AND THE FOUR WELLS WILL BE MONITORED FOR AN ADDITIONAL 12 MONTHS BEFORE RECOVERY WELL/GAS VENT E IS INSTALLED IF NECESSARY.

PROPOSED GRADING LEGEND

- PROP. INTERMEDIATE CONTOUR
- PROP. INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOURS
- EXISTING INDEX CONTOURS
- PROPOSED SLOPE INDICATOR
- PROPOSED FLOW DIRECTION
- 596.61 PROPOSED ELEVATION
- NESTED RECOVERY WELL/GAS VENT



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NESTED RECOVERY WELL/GAS VENT

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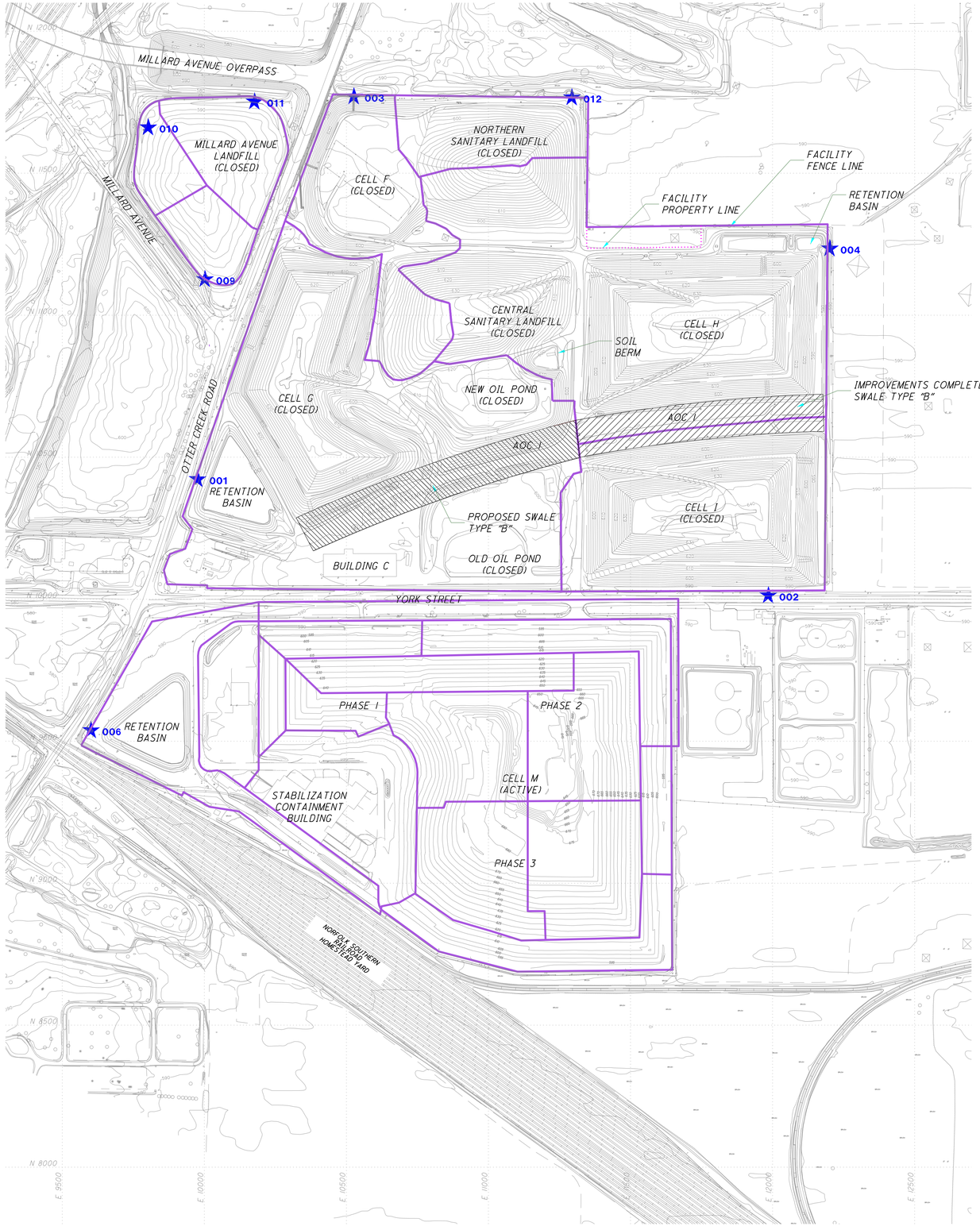


GRAPHIC SCALE

0' 100' 200' 400'

LEGEND

DRAINAGE DIVIDE

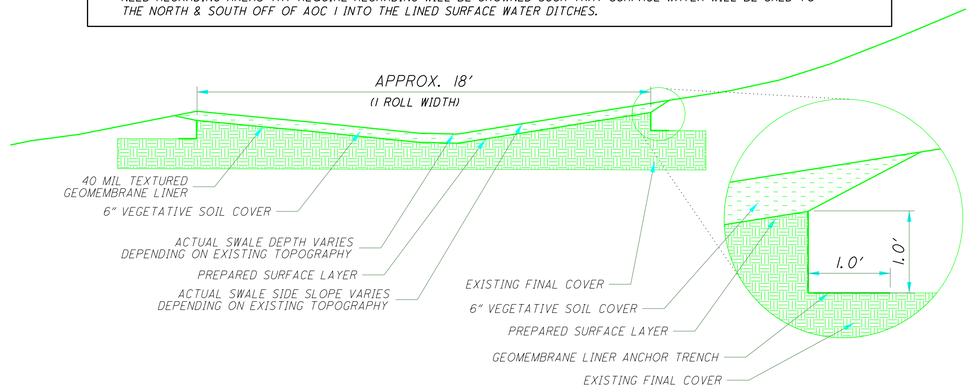
★ 003 NPDES OUTFALL AND NUMBER

NOTES

1. TOPOGRAPHIC INFORMATION IN THIS DRAWING WAS OBTAINED FROM AN AERIAL SURVEY CONDUCTED ON OCTOBER 6, 2002 BY AEROCON PHOTOGRAMMETRIC SERVICES, INC.
2. CELL M TOPOGRAPHY OBTAINED FROM FIELD SURVEYS PERFORMED BY THE MANNIK & SMITH GROUP, INC. WHICH ARE CURRENT TO APRIL 6, 2015.
3. DRAINAGE DIVIDES AND AREAS ARE BASED ON ENVIRON DRAWINGS 6174EDIA AND 6174EDIB, DATED 7/14/99, EXCEPT THAT THE EAST SIDE OF THE CENTRAL SANITARY LANDFILL IS IN THE CELL H DRAINAGE AREA.

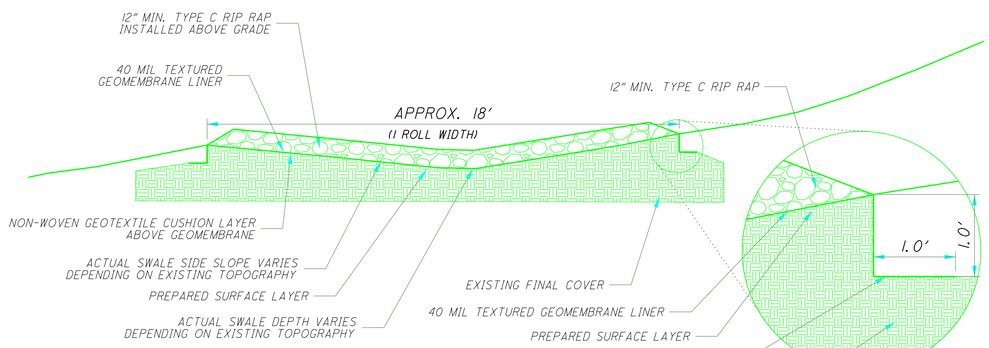
GENERAL NOTES:

1. SWALES TO THE NORTH AND SOUTH OF RAW WATERLINE TO BE GRADED SO AS TO MAINTAIN SURFACE WATER FLOW AND LINED IN ACCORDANCE WITH THE DETAILS BELOW.
2. FOR TYPE "A" SWALES EXISTING VEGETATION, TOPSOIL AND DELETEROUS MATERIAL TO BE STRIPPED AND SUBGRADE SURFACE COMPACTED AND SMOOTHED IN A MANNER THAT PROMOTES ADEQUATE INTERFACE BONDING PRIOR TO SWALE GEOMEMBRANE INSTALLATION. STRIPPED TOPSOIL MATERIAL TO BE RE-PLACED OVER THE GEOMEMBRANE FOR VEGETATIVE SOIL COVER.
3. FOR TYPE "B" SWALES EXISTING VEGETATION, TOPSOIL AND DELETEROUS MATERIAL TO BE STRIPPED AND REPLACED WITH CLAYEY FILL MATERIAL. THE SUBGRADE SURFACE TO BE COMPACTED AND SMOOTHED IN A MANNER THAT PROMOTES ADEQUATE INTERFACE BONDING PRIOR TO SWALE GEOMEMBRANE INSTALLATION. STRIPPED TOPSOIL MATERIAL TO BE RE-USED IN OTHER AREAS FOR VEGETATIVE SOIL COVER.
3. A 6-INCH THICK VEGETATIVE SOIL LAYER TO BE PLACED ABOVE THE GEOMEMBRANE FOR TYPE "A" SWALES.
4. A 12-INCH THICK RIP RAP PROTECTION LAYER TO BE PLACED ABOVE GRADE AND THE GEOTEXTILE FOR TYPE "B" SWALES.
5. GEOTEXTILE AND/OR GEOMEMBRANE TO BE ANCHORED IN TWO PARALLEL ANCHOR TRENCHES EXCAVATED ON EACH SIDE OF THE SWALE.
6. ANCHOR TRENCH TO BE BACKFILLED WITH COMPACTED EXCAVATED MATERIAL SUFFICIENT TO HOLD THE GEOTEXTILE AND/OR GEOMEMBRANE PANEL IN PLACE.
7. BUTT SEAMS IN THE GEOMEMBRANE LINER TO BE OVERLAPPED A MIN. OF 4-FEET.
8. VEGETATIVE SOIL LAYER TO CONSIST OF TOP SOIL MATERIAL CAPABLE OF PROMOTING HEALTHY GRASS GROWTH.
9. AS WORK PROGRESSES TO LINE THE STORM WATER DITCHES AOCI WILLBE ASSESSED TO DETERMINE AREAS THAT MAY NEED REGRADING AREAS THT REQUIRE REGRADING WILL BE CROWNED SUCH THAT SURFACE WATER WILL BE SHED TO THE NORTH & SOUTH OFF OF AOC I INTO THE LINED SURFACE WATER DITCHES.



TYPICAL SWALE "A" CROSS SECTION

NTS



TYPICAL SWALE "B" CROSS SECTION

INSTALLED FOR SWALES WITH GRADES GREATER THAN 2.5%
NTS

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SITE LAYOUT AND DRAINAGE DIVIDES

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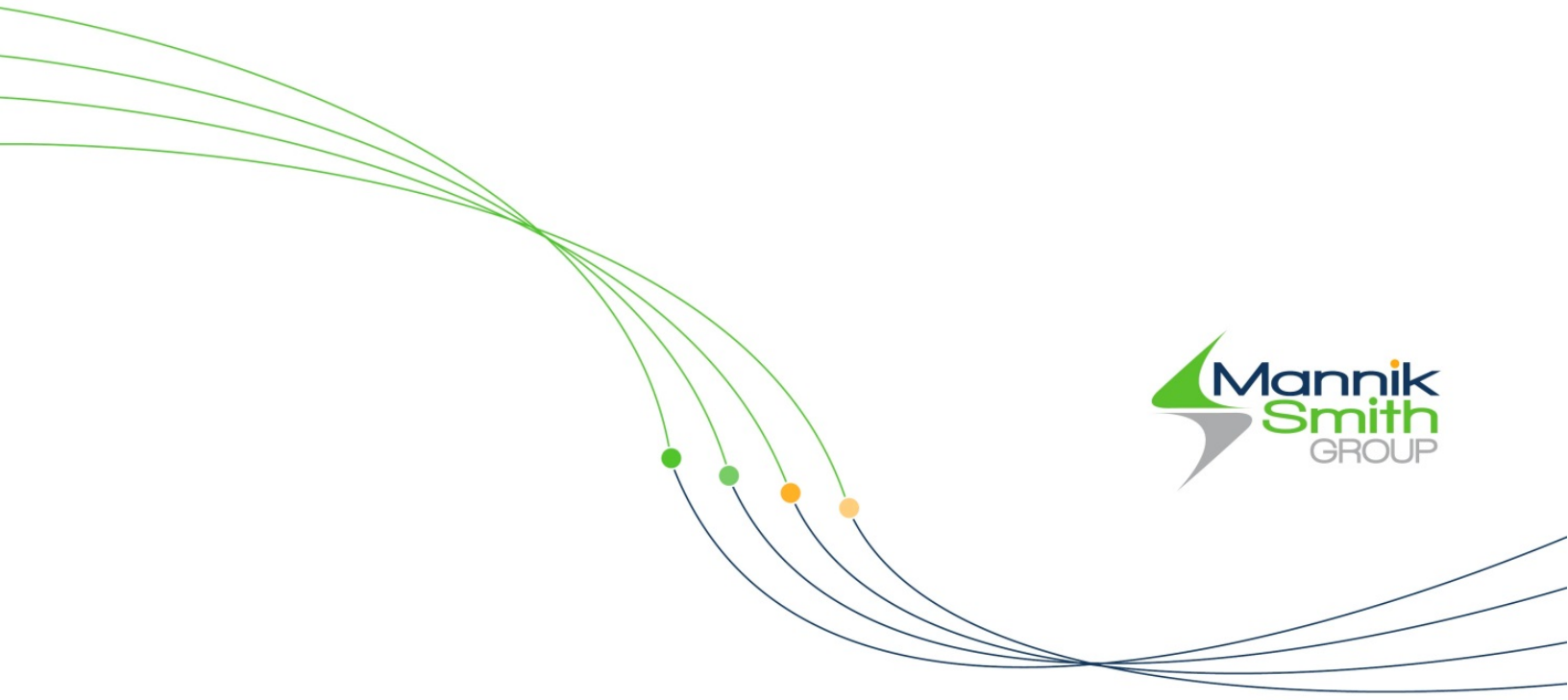
SWMU 9 NEW OIL POND



1.1 Basis of Design

The purpose of this design is to develop a plan to manage the conditions identified at SWMU 9, the New Oil Pond, which require corrective measures. During the RFI it was determined that surface water was ponding on top of SWMU 9. The ponded water is infiltrating into the cap and apparently accumulating at the cap/waste interface. This accumulated water has been noted as surface seeps in various locations on SWMU 9. In the CMS Report two corrective measure options were analyzed to address the infiltration of storm water and the subsequent seepage of water accumulated under the cap material to the surface. In-place containment with a new composite cap system was the chosen remedy and the design considerations included the following criteria:

- The waste throughout the unit does not contain significant free liquids and/or NAPL

  At the time SWMU 9 was closed, the waste was sufficiently stabilized. The waste mass is not currently or expected to produce water/leachate in the future. The surface seeps and oily water accumulation noted on top of the cap is attributed to the infiltration of surface water through the cap. The infiltrated water is accumulating at the waste/cap interface and then becoming visible through the surface seeps.

- The waste is stable enough to support the load from the cap and equipment

  The cap has not subsided since the unit was closed. This can be corroborated through historic pictures and survey information. The installation of the new composite cap will not add additional weight to the unit. The installation of a drainage layer will keep water that could act as additional driving force from collecting in the cover soils.

- Much of the drainage from the cap is diverted from City of Toledo water line easement.

  Storm water currently accumulates in a bowl like area on the cap surface and may migrate under the cap where it is in contact with waste material at the waste/cap interface. The ponded surface water evaporates or is pumped and managed as leachate. Storm water that drains from the side slopes has not been in contact with waste and is diverted away from the City of Toledo water line easement through the trenches that border the south side of the unit. It is managed through the facility's storm water management system. The installation of an impermeable flexible membrane liner over a properly graded cap will eliminate the potential for surface water to infiltrate through a soil cap and contact the waste material. After composite cap installation any water that drains from the cap will be clean surface water and be managed though the facility's surface water management system.

1.2 Development of Design

- Preparation for installation of the Composite Cap

  To install the new composite cap, the existing cap will need to be removed. Any water that has accumulated at the waste/cap interface will be removed by pumping to the existing dewatering system. The leachate will be pumped into a frac tank or one of the SWMU 6 or SWMU 7 leachate tanks and properly disposed. Removal of the existing top three feet of

cap material will then be conducted to expose the new final cover subgrade. Any of the removed material that is suitable for use as frost protection will be stockpiled for use after the composite cap has been constructed. Materials that are not suitable (potentially contaminated) will be removed from SWMU 9 and disposed of in Cell M. The suitability of the subgrade material to act as a base for the cap will be determined in the field via proof rolling. Proof rolling shall be performed using a loaded haul truck with a minimum weight of 20 tons, or equivalent vehicle/equipment. An acceptable proof roll results in deformation or displacement of subgrade soils of two inches or less (≤2"). If material from this thickness needs to be removed it will be placed into the active Cell M. If the material is competent as a base for the clay cap it will be left in place and prepared for construction. Any areas that require the removal of material will be brought back up to grade as the subgrade is prepared for recompacted soil barrier construction.

- Composite Cap Construction

  Recompacted Barrier Layer – Once the subgrade is prepared, clay will be placed in 8 inch loose lifts and compacted according to ESOI's authorizing documents. The recompacted barrier layer will be installed to a final thickness of two feet.

  Flexible Membrane Liner – A 40 mil FML will be installed over the recompacted clay barrier. The FML will be continuous across the unit and keyed into an anchor trench around the perimeter.

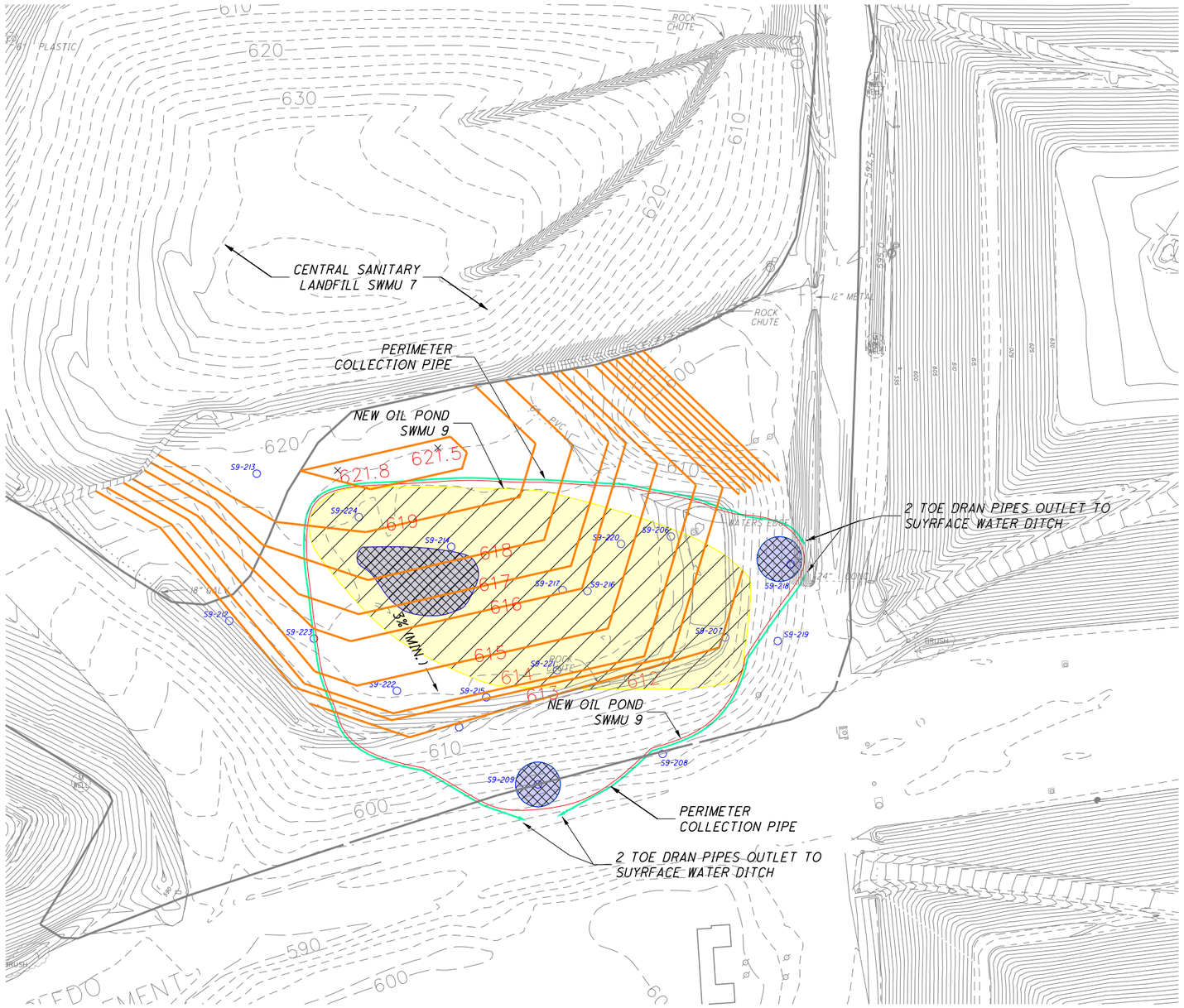
  Drainage Geocomposite – In order to promote drainage of surface water off of the cap, a geocomposite will be installed on top of the FML. The geocomposite will be wrapped around perimeter collection pipes and drain pipes installed to allow the water to exit into surface water control ditches.

  Frost protection layer – a frost protection layer will be installed over the geocomposite to insulate the recompacted barrier layer from freeze thaw cycles.

- Final Grading

  The final slopes of SWMU 9 will be graded to ensure proper drainage as described in Section I-3f of ESOI's Part B application. The unit will be graded so that water does not pond and the drainage channels direct the surface water off of the unit and into surface water control structure(s).

Plan Sheet Set
Grading plan and
Cap cross section details

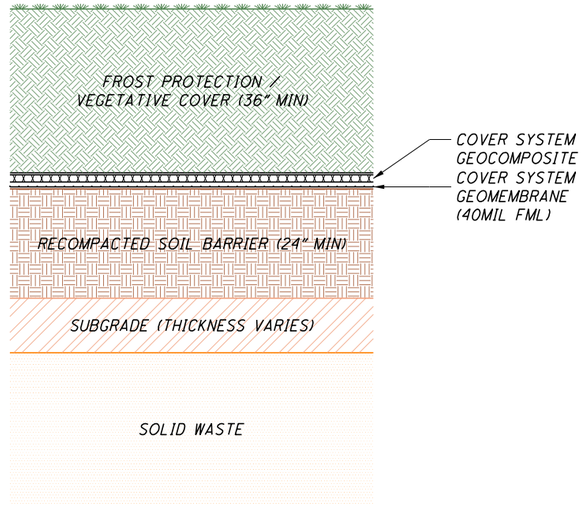


NOTE: PERIMETER COLLECTION PIPE TO OUTLET INTO DITCH LINED IN ACCORDANCE WITH DETAILS ON SHEET 5/5 IN THE SWMU8 SECTION.

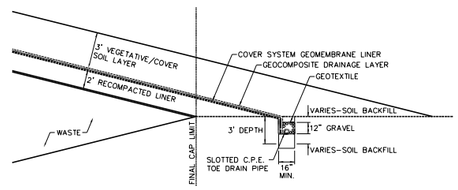
LEGEND

- 610 — EXISTING MAJOR CONTOUR (10' INTERVAL)
- EXISTING MINOR CONTOUR (2' INTERVAL)
- 620 — PROPOSED GROUND SURFACE ELEVATION TO ACCOMMODATE A 3% GRADE SLOPING IN A SOUTHWARD DIRECTION
- ADDITIONAL AREA TO BE SPOT GRADED
- NAPL AREA SURFACE SEEP
- SUBSURFACE NAPL
- 3% FLOW ARROW AND GRADE SLOPE
- GROUNDWATER\LEACHATE
- PROPOSED CONTOUR
- LIMIT OF COMPOSITE CAP
- PERIMETER COLLECTION PIPE
- × PROPOSED SPOT ELEVATIO

GRAPHIC SCALE
0 25' 50' 100'



FINAL CAP
NOT TO SCALE



TYPICAL ANCHOR TRENCH/TOE DRAIN DETAIL
NOT TO SCALE

ENVIROSAFE - CORRECTIVE ACTION PRELIMINARY ENGINEERING DESIGN

SWMU 9

NO.	DATE	BY	DESCRIPTION
0	09/25/2018	SGW	PRELIMINARY ENGINEERING DESIGN
1	07/11/2019	NAC	RESPONSE TO OEPA COMMENTS

FIGURE 9.1

ENVIROSAFE SERVICES OF OHIO, INC.
ENVIROSAFE SERVICES OF OHIO, INC.
OREGON FACILITY

Mannik Smith Group
TECHNICAL SKILL. CREATIVE SPIRIT.
www.MannikSmithGroup.com

7/11/2019

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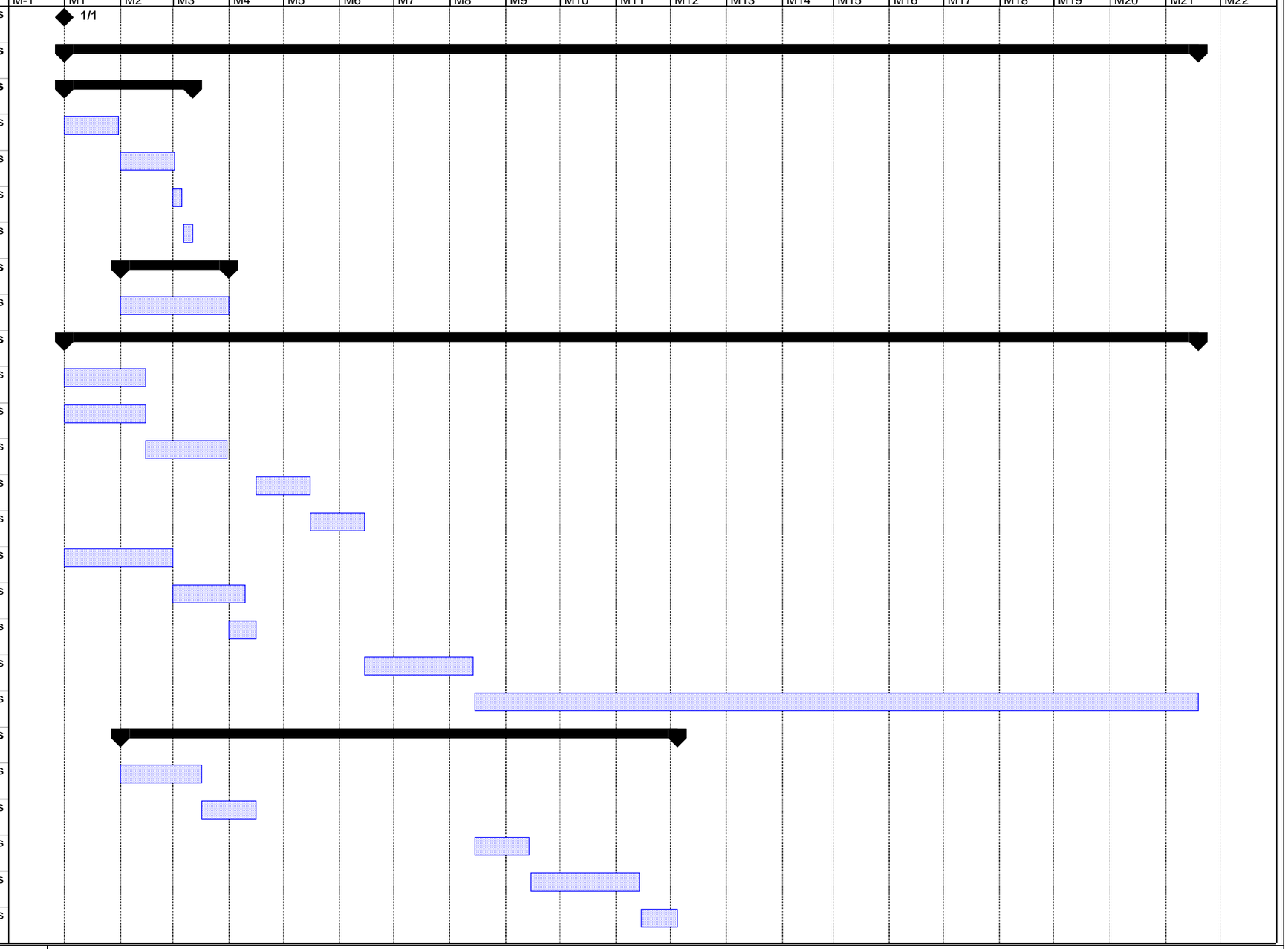
APPENDIX C
Implementation Schedule

CORRECTIVE MEASURES IMPLEMENTATION SCHEDULE

ID	Task Name	Duration
1	Receive Ohio EPA Approval for Final Design	0 days
2	**Corrective Measures Implementation**	**627 days**
3	**SWMU 5 (NAPL Extraction at Millard)**	**71 days**
4	Startup/Contracting	30 days
5	Purchase Equipment and Delivery of System	30 days
6	Equipment Installation	5 days
7	Equipment Testing	5 days
8	**SWMU 6 (Relocation of Waste at NSL)**	**60 days**
9	Construction Sequence (See Engineering Design)	60 days
10	**SWMU 8 (Containment of Old Oil Pond)**	**627 days**
11	Startup/Contracting	45 days
12	Building Steel Delivery	45 days
13	New Building Construction	45 days
14	Moving	30 days
15	Building C Demolition	30 days
16	Barrier Wall Delivery	60 days
17	Barrier Wall Installation	40 days
18	Closure of Tanks and Utility Vaults	15 days
19	Cap Repairs and Re-grading	60 days
20	Installation of Leachate/NAPL and Gas Extration Wells*	400 days
21	**SWMU 9 (New Oil Pond Cap Improvements)**	**308 days**
22	Startup/Contracting	45 days
23	Purchase Supplies	30 days
24	Preparation for Composite Cap Installation	30 days
25	Composite Cap Construction	60 days
26	Final Grading	20 days



Schedule and sequence may vary based on items such as Contractor Availability; Delivery of Supplies; Equipment Functionality, Weather Conditions, and Timely Reimbursement from Trust Fund. Modifications will be provided in the monthly Progress Reports.

Task
Split
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Split
Rolled Up Milestone
Rolled Up Progress
External Tasks
Project Summary
External Milestone
Deadline

*Any SWMU 8 recovery wells/gas vents installed following the initial evaluation period will be installed as soon as practical. The schedule allows for a total of 400 days. This may be extended to evaluate, design changes, and install additional wells.

APPENDIX D
Permit Condition E.9(c)(ix)

(ix) WMU 8 Old Oil Pond

The selected remedy for WMU 8 is

(a) Contain waste in-place by repairing cap at locations where NAPL tar seeps have been observed, installing leachate/NAPL recovery wells, installation of passive gas recovery/vents, and installation of barrier wall surrounding limits of waste.

(b) Removal (including capping of floor slabs) and replacement of Building C (AOC 3) (in an alternate location), and removal or stabilization and capping of AOC 12, AOC 7, and AOC 5 within the isolation barrier wall of WMU 8.

(x) WMU 9 New Oil Pond

The selected remedy for WMU 9 is:

(a) Upgrade Cap to a Composite Cover. This includes re-contouring of the landfill cover to provide positive drainage, and minimizing accumulation and infiltration of storm water.

(b) Installation of recovery wells.

(c) Excavate current cap to remove top zone of stabilized waste.

(xi) AOC 1 Toledo Water Line

The selected remedy for AOC 1 is to reduce volume of water in trenches by removing vegetation from drainage ditches along this AOC, and re-grading and recapping the areas along waterline right-of-way to improve runoff and reduce infiltration.

(xii) AOC 5 Decontamination Building Underground Storage Tanks (UST)

The selected remedy for WMU 8 (Condition E.9(d)(ix)) also addresses AOC 5.

(xiii) AOC 7 Butz Crock — Utility Vault

The selected remedy for WMU 8 (Condition E.9(d)(ix)) also addresses AOC 7.

(xiv) AOC 12 Building "C" Heating Oil Tank

The selected remedy for WMU 8 (Condition E.9(d)(ix)) also addresses AOC 12.