



Parcels 1 and 2 Remedial Action Work Plan

**1130 Niagara Street, NYSDEC Site No.
C915284**

Jenesis Development, LLC

July 14, 2022

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Printed date	7/14/2022 12:40:00 PM
Last saved date	July 14, 2022
File name	C:\Users\kgalanti\Documents\Projects\Jenesis\11219347 - Thermal Design\11219347-Parcels 1 and 2 Remedial Action WP.docx
Author	Katherine B. Galanti
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Client name	Jenesis Development, LLC
Project name	Jenesis-1130 Niagara Brownfield Rem
Document title	Parcels 1 and 2 Remedial Action Work Plan 1130 Niagara Street, NYSDEC Site No. C915284
Revision version	Rev [00]
Project number	11219347

Document status

Status Code	Revision	Author	Reviewer		Approved for issue		
			Name	Signature	Name	Signature	Date
S3	0	K. Galanti	C. Martin K. Megnin R. Snyder		C. Martin		1/31/2022
S3	1	K. Galanti	C. Martin		C. Martin		7/14/22
[Status code]							
[Status code]							
[Status code]							

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1. Introduction

GHD Consulting Services Inc. (GHD) was retained by Jenesis Development, LLC (Jenesis) to prepare this Remedial Action Work Plan (RAWP) under the guidelines of the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP) for Parcels 1 and 2 of the 1130 Niagara Street Site (Site) located in Buffalo, New York. A Site Location Map is presented on Figure 1.1. A Site Plan showing the parcels that comprise the Site is presented on Figure 1.2. The boundaries are based on tax map data for the property.

GHD submitted the initial RAWP to NYSDEC in January 2022. NYSDEC provided comments in a letter dated April 8, 2022, to which GHD responded on May 9, 2022. Representatives of NYSDEC, Jenesis, and GHD reviewed the comments and responses in a call on May 24, 2022. This revised work plan summarizes the changes as discussed between the parties.

1.1 Purpose of this Report

The purpose of this RAWP is to present the proposed plans to implement the selected remedy as stated in the NYSDEC Decision Document dated June 2021.

1.2 Scope and Limitations

The opinions, conclusions, and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

2. Site Description and History

The Site is situated on three acres of land at 1130 Niagara Street in Buffalo, New York, and is owned by Jenesis. Gull Street bisects the Site creating a northern portion (Parcel 3) and southern portion (Parcels 1 and 2). Parcel 3 is being addressed under a separate Remedial Action Work Plan, which was conditionally approved by the NYDSEC on January 14, 2022.

The southern portion of the Site that is the focus of this Remedial Action Work Plan was formerly occupied by an approximately 45,000 square foot warehouse building (Parcel 1) that covered most of the property. The warehouse structure was demolished in early 2016. The concrete floor slab remains in place. An asphalt covered loading dock area and a vegetated area comprise Parcel 2. The vegetated area was historically the Site of a multi-story building of unknown size that was destroyed by fire in 2008.

A review of historical information indicated that the warehouse building was constructed between 1925 and 1927, and portions of the Site have been in industrial use since prior to 1889. The Site was purchased in 1960 by Curtis Screw for manufacturing and metal machining. Reportedly, it was during Curtis Screw's ownership and use of the Site that trichloroethene (TCE) and 1,1,1-trichloroethane (1.1.1-TCA) degreasers were used, and the products were released to the environment. The property was sold to Gerspach Properties in 2005. Jenesis purchased the site in 2015.

2.1 Physical Setting

The Site is located in the City of Buffalo, New York, in a mixed-use area zoned M1 - Light Industrial. The surrounding area is a mix of commercial and industrial use, with residential properties located approximately 750 feet to the east. The Site is relatively flat and is bordered by the following properties:

North: by Rich Products Corporation with Robert Rich Way and additional commercial properties located beyond

East: by Niagara Street with commercial and residential properties located beyond

South: by Oliver Gear with additional commercial properties located beyond

West: by railroad tracks with Interstate 190 and the Black Rock Canal located beyond

There are no surface water bodies or water courses located on or immediately adjacent to the Site. The nearest surface water body/water course is the Black Rock Canal, located approximately 100 yards to the west.

2.1.1 Site Geology

The overburden geology in the immediate vicinity of the site is classified as urban land and is mostly covered by streets, parking lots, and buildings. The native regional overburden consists of glacial till and glacial lacustrine deposits, predominantly silts and clays. The site overburden geology was found to be generally consistent with the regional overburden geology.

The geologic profile at the Site can be grouped into three basic units. These units, in descending order, consist of a surficial fill unit, a native silty clay unit with interbedded sand/silty sand units (encountered within the native silty clay unit), and limestone bedrock. Each of the units are discussed in more detail as follows.

Surficial Fill – The surficial fill is generally a mixture of sand, clay, and gravel with brick fragments, wood, and cinders which is typically moist. The thickness of the fill unit is generally 5 to 6 feet on Parcel 1. On Parcel 2, the fill unit is generally 4 feet in thickness, but can be between 1.5 feet at the western end of Parcel 2 to 11.5 feet in areas of prior disturbance.

Native Silty Clay – The native silty clay is typically brown to gray, with fine gravel and sand and generally low plasticity. The thickness of the silty clay unit is typically 10 to 11 feet on Parcel 1 and ranging in thickness from 4 to 12 feet. On Parcel 2, the silty clay ranges in thickness from 0 to 10 feet as you move from west to east. The clay unit contains laterally discontinuous sand/silty sand seams, which are typically moist.

Onondaga Limestone Bedrock – Depth to bedrock is typically 16 feet on Parcel 1 with depths ranging from 15.1 to 16.4 feet below grade. On Parcel 2, depth to bedrock ranges from 4 to 12 feet below grade as you move from west to east.

2.1.2 Hydrology

Groundwater was encountered in the overburden and in bedrock. The groundwater in both units flows generally in a westerly direction towards the Blackrock Canal/Niagara River.

3. Remedial Investigations

Several environmental investigations were conducted at the Site between 2004 and 2016. The NYSDEC approved Remedial Investigation (RI), and supplemental RI activities were completed between 2015 and 2020. Historical and RI investigation results were presented in the Remedial Investigation/Alternatives Analysis/Interim Remedial Measure (RI/AA/IRM) report dated August 2020.

A pre-design investigation (PDI) was completed in November and December 2020 in accordance with the PDI Work Plan dated October 16, 2020, and approved by NYSDEC on November 6, 2020. The purpose of the PDI was to build on the previous source area delineation borings completed in 2016 to define the target area for thermal treatment (horizontal and vertical extents) and to provide additional pertinent site-specific data (e.g., soil porosity, fraction of organic carbon [Foc]) to facilitate the design of the thermal treatment system. The PDI is summarized below.

3.1 PDI Activities

The PDI consisted of installation of 41 soil borings and 5 soil borings/shallow bedrock monitoring wells on Parcels 1 and 2 within and around the 2016 source area investigation. Of the 41 soil borings, 12 were advanced adjacent to previously installed 2016 locations to gather additional vertical delineation data, 20 new locations were installed building on the 2016 sampling grid, and an additional 9 step-out borings were installed based on field screening and expedited sample results. Figure 3.1 shows the sampling locations completed as part of the PDI.

Soil borings were installed by Earth Dimension, Inc. (Earth Dimensions) using a standard drill rig with hollow-stem augers. The soil borings were continued until refusal at all locations. At each soil boring location, the following was completed:

- Soil samples were collected from each 2-foot interval from ground surface to refusal using a split-spoon sampler
- Soils were screened for total volatile organic compounds (VOCs) using a flame ionization detector (FID)
- Soils were classified using the Unified Soil Classification System
- Visual and olfactory observations were made
- Oil-in-Soil™ hydrophobic dye tests were conducted on each soil core biased to the most likely area of dense non-aqueous phase liquid (DNAPL) presence based on FID screening
- A soil sample from each 2-foot interval, generally beginning at 2 feet, was submitted for VOC analysis via United States Environmental Protection Agency (USEPA) Method 8260 to Eurofins/TestAmerica, Buffalo located in Amherst, New York
- Representative samples of each soil type were submitted for Foc and porosity testing to support the thermal treatment system design. Foc analysis was completed by Eurofins/TestAmerica, while porosity testing was completed by Integrated Geosciences Laboratories, LLC of Houston, Texas
- Where sufficient groundwater volume was present, groundwater grab samples were collected from the completed boreholes for VOC analysis prior to backfilling and submitted for VOC analysis via USEPA Method 8260 to Eurofins/TestAmerica, Buffalo

Five shallow bedrock groundwater monitoring wells (MW-106 through MW-110) were installed by Earth Dimensions within the targeted treatment zone to assess groundwater quality in the shallow bedrock near the overburden/bedrock interface. The monitoring wells were constructed with stainless steel well screens and risers due to the location within the heating zone.

GHD also completed a limited packer test on existing bedrock wells MW-102 and MW-105 to determine if VOC concentrations could be isolated to the shallow bedrock or were consistent throughout the bedrock. With the assistance of Earth Dimensions, two water-producing fracture zones in each well were able to be isolated and sampled for VOCs.

Data from the PDI, in conjunction with the RI data, were used to generate a 3D visualization showing the vertical and horizontal extent of soil and bedrock to be treated.

Boring logs and well construction logs from the PDI drilling activities are provided in Appendix A.

3.2 PDI Results

Soil analytical results from the PDI are presented in Table 1 and shown on Figure 3.2. Of the 172 soil samples collected, 162 samples had detections of TCE and 120 samples had detections of 1,1,1-TCA.

- 96 samples at 29 locations had detections of TCE exceeding the 0.47 milligram per kilogram (mg/kg) 6 NYCRR Part 375 Protection of Groundwater (PoG) soil cleanup objective (SCO), while 27 samples at 12 locations had detections of 1,1,1-TCA exceeding the 0.68 mg/kg PoG SCO.
- 56 samples at 21 locations had detections of TCE exceeding 1 milligram per kilogram (mg/kg), while 22 samples at 9 locations had detections of 1,1,1-TCA exceeding 1 mg/kg.

- 5 samples at 3 locations exceeded the 6 NYCRR Part 375 Restricted Use Soil Cleanup Objectives for Protection of Public Health – Commercial Use (RUSCO-C) SCO for TCE of 200 mg/kg, and only 2 samples at 1 location had concentrations of 1,1,1-TCA exceeding the RUSCO-C SCO of 500 mg/kg.

Overburden and bedrock groundwater analytical results are presented in Tables 2 and 3, respectively, and shown on Figure 3.3. For comparison purposes, the most recent groundwater results (May 2019) for existing monitoring wells in the treatment area are also shown on Figure 3.3. Out of 35 grab overburden groundwater samples collected from 35 boreholes, GP-52, was non-detect for VOCs and GP-53 exhibited only 1,1-dichloroethane, cis-1,2-dichloroethene, and vinyl chloride above respective groundwater criteria. The remaining 33 locations exhibited TCE in excess of the groundwater standard at concentrations ranging from 8.5 micrograms per liter (ug/L) at GP-50 to 190,000 ug/L at GP-C-1. 1,1,1-TCA was detected above the groundwater standard at 23 of the locations, with concentrations of 1,1,1-TCA ranging from 5.6 ug/L at GP-40 to 39,000 ug/L at GP-C-1. All 1,1,1-TCA exceedances of the groundwater standard were at locations that also exhibited elevated TCE. Six locations did not generate sufficient groundwater for collection of a grab sample.

TCE was detected in all five shallow bedrock monitoring wells installed at concentrations ranging from 1,700 ug/L at MW-106 to 280,000 ug/L at MW-109. 1,1,1-TCA was detected in all shallow bedrock monitoring wells with the exception of MW-110 and was present at concentrations ranging from 130 ug/L at MW-106 to 490,000 ug/L at MW-109.

In general, the results of the packer testing did not provide sufficient data to formulate definitive conclusions regarding the vertical migration of contaminants with depth within the bedrock. MW-103 had been planned to be tested, but due to the presence of a thin layer of NAPL on the water surface within the well, the decision was made to forgo the test at this location due to concerns for fully decontaminating the packer equipment. The tests were completed at MW-102 and MW-105; however, each well had only two fracture zones that produced water approximately 10 feet apart and 5 feet apart, respectively. Each fracture zone was purged to dryness and only recovered sufficient volume to complete the VOC sampling after an hour of recharge time. At MW-102, TCE ranged from 70,000 ug/L in the shallower fracture zone (19-24 feet below ground surface [ft bgs]) to 29,000 ug/L in the deeper fracture zone (35-38 ft bgs), while 1,1,1-TCA ranged from 5,400 ug/L to 10,000 ug/L in the same zones. At MW-105, concentrations of TCE ranged from 3,000 ug/L in the shallower fracture zone (23-28 ft bgs) to 810 ug/L in the deeper fracture zone (33-38 ft bgs), while 1,1,1-TCA ranged from 380 ug/L to 130 ug/L in the same zones. 1,1-DCA, 1,1-DCE, and cis-1,2-DCE showed similar, limited variation between the zones. The groundwater sampling results from the packer tests are presented in Table 4.

The validation report for analytical data generated as part of the PDI is provided in Appendix B.

Three-dimensional presentations (4DIMs) using the chemical data collected as part of the PDI and existing RI data were completed using C Tech's EVS/MVS (EVS) software package. 4DIMs were created for both TCE and 1,1,1-TCA and were used to assist in determining the area of treatment. The figures discussed in Section 5 were generated from the visualization program. The visualizations and necessary software can be provided as a separate deliverable.

4. Standards, Criteria, and Guidance

The Standards, Criteria, and Guidelines (SCGs) applicable to the selected remedy for Parcels 1 and 2 are the Part 375 RUSCO-C and Part 375 PoG criteria for Site soils and City of Buffalo ordinances and building codes for any structural component included in the design. The RUSCO-C and PoG criteria for the VOCs of concern at the site and associated breakdown products are shown below:

Contaminant	RUSCO-C SCOs (ug/kg)	PoG SCOs (ug/kg)	Concentration Range (ug/kg)	Method Detection Limit Range (ug/kg)
Trichloroethene	200,000	470	0.13 – 3,400,000	0.013 - 28
1,1,1-Trichloroethane	500,000	680	0.31 – 7,900,000	0.014 - 28

Contaminant	RUSCO-C SCOs (ug/kg)	PoG SCOs (ug/kg)	Concentration Range (ug/kg)	Method Detection Limit Range (ug/kg)
Cis-1,2-Dichloroethene	500,000	250	0.078 – 5,300	0.014 - 28
Trans-1,2-Dichloroethene	500,000	190	0.024 – 110	0.011 - 24
1,1-Dichloroethene	500,000	330	0.58J – 190,000J	0.016 - 35
1,2-Dichloroethane	30,000	20	ND – 0.62J	0.019 - 41
1,1-Dichloroethane	240,000	270	0.49J – 430J	0.014 - 31
Vinyl Chloride	13,000	20	0.66 J – 240	0.017 - 34
Chloroethane	NC	NC	ND	0.010 - 21

NC – no criteria
ND – non-detect

The goal of the thermal treatment program will be to reduce concentrations of TCE, 1,1,1-TCA, cis-1,2-DCE, and 1,1-DCE to a site-specific action level (SSAL) of 1 part per million (1,000 ug/kg for each individual contaminant. This SSAL was selected based on the following factors:

- It goes beyond what is required by the current RUSCO-C criteria;
- It is achievable with the selected technology in a reasonable timeframe;
- It will significantly reduce both contaminant levels in groundwater and the potential for soil to impact groundwater quality, although not actively treating to groundwater targets, thereby allowing groundwater quality to improve over time;
- It will reduce the concentration of soil vapor and the potential for vapor intrusion both off-site and for future on-Site development; and
- It will simplify soil management for future development of the Site.

Although the PoG SCOs will not immediately be achieved:

- The soil will be treated to the extent that it eliminates the source of groundwater contamination;
- Groundwater quality within the treatment zone will be improved;
- PoG SCOs will be achieved in due course; and
- The approach meets the goal of protection of groundwater and groundwater restoration.

5. Parcels 1 and 2 Extent of Contamination

Laterally, TCE impacts to soil above the 1 mg/kg SSAL extend from GP-62 in the north to GP-37 in the south; and from MW-106 and GP-51 on Parcels 1 and 2, respectively, in the east to MW-108 and GP-48 on Parcels 1 and 2, respectively, in the west. Soils exhibiting greater than 1 mg/kg 1,1,1-TCA were co-located with soils also exhibiting TCE impacts. Figure 5.1 shows the limits of TCE contamination greater than 1 mg/kg as generated by the model¹. Cross-sections of the contaminant plume are shown on Figures 5.2 through 5.4. In total, an area of about 13,250 square feet will be treated: 7,990 square feet on Parcel 1 and 5,260 square feet on Parcel 2.

¹ Although not captured by the model because it was the result of an average between a parent sample (0.9 mg/kg) and duplicate (1.6 mg/kg), one outlier location, GP-47 exhibits an average TCE concentration of 1.25 mg/kg in the southwest corner of Parcel 2. If soil quality at this location is not improved by the synergistic effects of the thermal treatment and natural biological activity, this location will be addressed through other means to meet the SSAL.

Soil impacts extend into the shallow bedrock. As such, the selected treatment system is expected to address the upper 5 feet of bedrock across Parcels 1 and 2, with treatment extending into the upper 10 feet of bedrock within the immediate source area. In total, an area of 5,870 square feet will be treated to 10 feet into bedrock, while the remaining 7,380 square feet will be treated to 5 feet into bedrock.

Although soil remediation is the primary focus, impacted groundwater within the treatment zone will be remediated concurrently within the treatment zones.

6. Parcels 1 and 2 Selected Remedy

In-situ thermal treatment will be implemented to destroy or volatilize VOCs in the source area soil and bedrock located in the central portion of Parcel 1 and an adjoining portion of Parcel 2. Thermal conductive heating (TCH) will be utilized to perform the treatment. Based on the results of the PDI, an area of approximately 13,250 square feet will be treated with TCH. The area of treatment is shown on Figure 6.1. The area in the center of the plume will be treated to a depth 10 feet into bedrock, while the perimeter area will be treated to 5 feet into bedrock.

TCE is the predominant contaminant at almost all locations within the treatment zone; 1,1,1-TCA exhibits higher concentrations at four locations (GP-B, GP-C-1, GP-5, and MW-109), with TCE also being present in these locations at elevated concentrations. Because TCE has the highest boiling point of the chlorinated compounds, other cVOCs will be volatilized and destroyed at a faster rate as the ground is heated toward 100°C. The table below summarizes the boiling points for TCE, 1,1,1-TCA, and associated breakdown products.

Contaminant	Boiling Point (°C)
Trichloroethene	87.2
1,1,1-Trichloroethane	74
cis-1,2-Dichloroethene	60.2
trans-1,2-Dichloroethene	47
1,1-Dichloroethene	32
1,2-Dichloroethane	83.5
1,1-Dichloroethane	57.2
Vinyl Chloride	-13.4
Chloroethane	12.3

The gases and condensate produced by the thermal treatment will be collected by horizontal vapor extraction wells and treated in an ex-situ treatment unit through adsorption on vapor- and liquid-phase granular activated carbon.

After completion of the thermal treatment, residual groundwater contamination will be addressed with monitored natural attenuation (MNA). Groundwater will be monitored for VOCs and MNA indicators, which will provide an understanding of the biological activity breaking down the remaining contamination. It is anticipated that contamination will decrease by an order of magnitude in a reasonable period of time (5 to 10 years). Reports of the attenuation will be provided annually until data suggests that monitoring is no longer necessary (5 to 10 years), and active remediation will be proposed if it appears that natural processes alone will not address the residual contamination. The contingency remedial action will depend on the information collected. An assessment of natural bacteria capable of consuming chlorinated VOCs in the site groundwater will be implemented and if required, the groundwater will be inoculated with bacteria capable of consuming chlorinated VOCs as a contingency remedial action in order for MNA to be effective.

Isolated pockets of shallow soil on Parcel 2 exhibit concentrations of polyaromatic hydrocarbons (PAHs) (SB-108 and SB-109) and metals (SP-8) slightly above commercial criteria. If these areas are not removed as part of future site development, the areas will be covered with a minimum of 1 foot of soil placed over a demarcation layer, with the upper 6 inches of soil of sufficient quality to maintain a vegetative layer. Soil cover material, including any fill material brought to the site, will meet the SCOs for cover material for the use of the site as set forth in 6 NYCRR Part 375-6.7(d).

Institutional Controls (ICs), including an environmental easement, restriction of the future use of the Site to commercial use, prohibition of the use of groundwater, and a Site Management Plan (SMP) would be used to ensure direct contact with remaining impacted soil and/or groundwater is prevented and any future intrusive activities, such as new building construction, are conducted in a manner to prevent migration of contaminants and reduce risk to Site workers.

7. Remedial Action

7.1 Thermal Treatment

The detailed design for the thermal treatment system has been prepared by Jenesis's selected contractor, TerraTherm, Inc. (TerraTherm) of Gardner, Massachusetts. TerraTherm's remedial action work plan and detailed design drawings are attached as Appendix C. GHD will oversee TerraTherm's activities, documenting activities and treatment milestones.

Prior to construction of the thermal treatment system, temporary stickup extensions will be added to the steel-cased bedrock monitoring wells MW-102 and MW-105 through MW-108. GHD will abandon existing PVC monitoring wells CEM-MW-2, CRA-MW-2, MW-8, MW-12, and MW-18 within and proximate to the thermal heating zone, since the wells will be damaged by the heat and will no longer be viable. Locations CRA-MW-2, MW-8, and MW-18 will be reinstalled upon completion of heating to monitor groundwater quality going forward. Locations MW-12 and CEM-MW-2 will not be reinstalled as these locations have routinely produced insufficient water for sampling since the start of the RI. The monitoring well locations to be abandoned and/or reinstalled are shown on Figure 7.1.

Once TerraTherm determines that the SSALs have been met and prior to dismantlement of the treatment system, GHD will complete soil sampling in each of the 8 treatment zones (A through H, as identified in TerraTherm's RAWP) to confirm that SSALs have been achieved. A total of 18 soil borings will be installed to the top of bedrock. Samples will be collected every 2 feet and submitted to Eurofins/TestAmerica, Buffalo for VOC analysis by USEPA method 8260. Based on the analytical results, the system will either be dismantled or restarted in any of the treatment areas that did not achieve the SSALs. In addition, 8 soil borings will be located around the perimeter of the treatment zone to confirm soil concentrations in this fringe zone between the SSAL and PoG limits, as well as 1 additional boring adjacent to location GP-47, the shallow overburden location outside the treatment zone that slightly exceeded the SSAL. One soil sample collected from the 2-foot interval exhibiting the highest PID reading will be submitted for VOC analysis from the fringe locations. In the absence of a maximum PID reading, the interval immediately above bedrock will be submitted for analysis, as this interval typically exhibited the highest VOC concentrations. The table below summarizes the anticipated sampling. Approximate sample locations are shown on Figure 7.2, although actual field locations may be adjusted slightly to work around the thermal system infrastructure.

Treatment Area	Number of Borings	Estimated Samples/Location	Total Samples (max)
A	2	4	8
B	1	5	5
C	1	6	6
D	1	4	4

Treatment Area	Number of Borings	Estimated Samples/Location	Total Samples (max)
E	2	5	10
F	1	6	6
G	6	7	42
H	4	7	28
Fringe	9	1	9
Total	27		118

The number of sample locations is equivalent to the number of samples generated by a 30-foot x 30-foot grid; however, this approach biases sample locations toward those areas with the highest VOC concentrations to confirm that SSALs have been achieved. Contaminants will be driven off relative to their starting concentration as a factor of temperature and time. Within a zone, soils will be heated for the same amount of time and at the same temperature regardless of concentration and will have the potential for the same mass to be driven off. As a result, soil with lower starting concentrations will have lower ending concentrations. If the location with the highest VOC concentration meets the SSAL of 1 ppm per contaminant, all other soils at lower concentrations within the zone will have met the 1 ppm SSAL.

If sample results indicate a treatment zone exceeds the SSALs, heating will resume within that zone and the locations (adjacent to the original sample points) will be resampled. The duration of additional heating will be determined based on the magnitude of the concentrations above the SSALs. This process will continue until the SSALs are achieved.

Groundwater monitoring will be conducted post-treatment to assess the improvement of groundwater quality over time. Two quarterly groundwater monitoring rounds are anticipated at this time. Samples will be analyzed for VOCs via USEPA method 8260. In addition, samples for natural attenuation indicator parameters will be collected from select wells and analyzed to aid in evaluating the progress of naturally occurring bacterial activity to break down residual groundwater contamination. The natural attenuation indicator parameters will include:

- Total and dissolved iron and manganese
- Ammonia nitrogen
- Sulfate
- Total Organic Carbon
- Nitrate
- Nitrite
- Orthophosphate
- Dissolved gasses (methane, ethane, ethene)
- Chloride
- Alkalinity
- Dehalococcoides (DHC)
- Vinyl Chloride Reductase (VCRA)

The table below summarizes the monitoring wells to be monitored and analytical parameters.

Location	Monitoring Zone	VOCs	NA Parameters
CRA-MW-2-R	Overburden	X	X
MW-8-R	Overburden	X	X
MW-9	Overburden	X	
MW-13	Overburden	X	

Location	Monitoring Zone	VOCs	NA Parameters
MW-17	Overburden	X	
MW-18-R	Overburden	X	X
MW-102	Bedrock	X	X
MW-103	Bedrock	X	X
MW-105	Bedrock	X	
MW-106	Shallow Bedrock	X	
MW-107	Shallow Bedrock	X	X
MW-108	Shallow Bedrock	X	
MW-109	Shallow Bedrock	X	X
MW-110	Shallow Bedrock	X	

The frequency and scope of any additional groundwater monitoring will be evaluated after completion of the two post-treatment monitoring rounds and will be incorporated into the SMP.

7.2 Air Emissions

A series of horizontal vacuum extraction wells (HVEWs) will be used to collect contaminant vapors as they are volatilized from the soil. The vapor recovery system will be operated under a net negative pressure. After cooling and separation to remove moisture from the vapor stream, recovered vapor will be treated through three 5,000-pound vapor phase granular activated carbon (GAC) vessels installed in series to recover the contaminants and control emissions. The detailed design of the vapor collection system and air emission calculations are included in TerraTherm's remedial action work plan attached as Appendix C.

7.3 Water Treatment and Disposal

Condensate from the vapor recovery system will be treated via gravity separation followed by carbon adsorption. The water treatment will consist of an oil/water separator to remove light and dense non-aqueous phase liquids, two 25-micron bag filters to remove particulates, and three 1,000-pound liquid phase GAC vessels to recover contaminants. The treated water will be stored in a frac tank pending analysis to verify compliance with Buffalo Sewer Authority (BSA) discharge criteria. Upon meeting the discharge criteria, treated water will be discharged to a combined sewer manhole at the intersection of Gull Street and Haggart Alley under BSA permit number 22-04-TP291. The detailed design of the water treatment system and BSA discharge permit are included in TerraTherm's remedial action work plan attached as Appendix C.

7.4 Final Cover

Jenesis understands that shallow soil (<1 foot in depth) must meet the Part 375 RUSCO-C criteria in order to obtain a Certificate of Completion for the project. If shallow soil is not compliant, the area must be covered by development (e.g., buildings, paved parking lots) or will require placement of a demarcation layer and 1 foot of additional final cover. Historically, two locations on Parcel 2 exhibited shallow soil exceeding the RUSCO-C criteria; however, these locations fall within the area of surface disturbance associated with the thermal treatment system construction where subsurface soil was placed on the ground surface beneath the thermal insulation layer. After decommissioning and removal of the thermal treatment system, Jenesis will prepare a sampling plan to assess whether additional cover is required for exposed soil on Parcel 2 and deteriorating hardscape areas on Parcels 1 and 2, or if Site development will cover any areas of impacted soil. Depending on the timeframe for future development, an interim cover may be installed.

8. Institutional and Engineering Controls

Upon completion of the construction of the remedial components for all Parcels at the Site, an environmental easement will be established for the controlled property that:

- Requires the remedial party or Site owner to complete and submit to the NYSDEC a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3).
- Allows the use and development of the controlled property for commercial use as defined by Part 375-1.8(g), though land use is subject to local zoning laws.
- Restricts the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDEC, New York State Department of Health (NYSDOH), or Erie County Department of Health.
- Prohibits agriculture or vegetable gardens on the controlled property.
- Requires compliance with the NYSDEC-approved SMP.

NYSDEC guidance DER-33 “Institutional Controls, A Guide to Drafting and Recording Institutional Controls” will be followed when drafting and recording the environmental easement.

Since the selected remedy results in contamination remaining at the Site that does not allow for unrestricted use, an SMP is required, which includes the environmental easement and an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the Site including:

- Cover systems installed as part of this remedy or future Site development.
- Existing cover systems (existing buildings, paved areas, and sidewalks, etc.).
- Future cover systems (proposed buildings, paved areas, and sidewalks, etc.).
- Fencing if used to prevent public access.

It is anticipated that the SMP will address the entire Site (Parcels 1, 2, and 3) and include:

- A Soil Management Plan which details the provisions for management of future excavations in areas of remaining contamination.
- Descriptions of the provisions of the environmental easement including any land use and groundwater use restrictions.
- A provision for evaluation of the potential for soil vapor intrusion for any buildings developed on the site, including provision for implementing actions recommended to address potential exposures related to soil vapor intrusion.
- Provisions for the management and inspection of the identified engineering controls.
- Maintaining Site access controls and NYSDEC notification.
- The steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.
- An Operations, Maintenance & Monitoring (OM&M) Plan to ensure continued operation, maintenance, monitoring, inspection, and reporting for any mechanical or physical components of the remedy and to assess the performance and effectiveness of the remedy including:
 - Monitoring of groundwater to assess the performance and effectiveness of the remedy.
 - A schedule of monitoring and frequency of submittals to the NYSDEC.
 - Monitoring for vapor intrusion for any buildings occupied or developed on the Site, if necessary.
 - Compliance monitoring of treatment systems to ensure proper OM&M as well as providing the data for any necessary permit or permit equivalent reporting.
 - Maintaining Site access controls and NYSDEC notification.
 - Providing the NYSDEC access to the site and OM&M records.

The SMP will be submitted in conjunction with the Final Engineering Report (FER) that will be prepared once the remedy for Parcels 1 and 2 is complete.

9. Health and Safety Plan

The project Health and Safety Plan (HASP) and Community Air Monitoring Plan (CAMP) are presented in Appendix D.

These plans have been prepared consistent with applicable governmental and non-governmental regulations and guidelines. In particular, the amended rules of OSHA Subpart H of Part 1910 (Title 29 Code of Federal Regulations (CFR) Part 1910.120), and the New York State Department of Health Generic Community Air Monitoring Plan. The HASP may be revised or updated based on the contractor selected and the means and methods to be used for construction of the remedy.

Contractors will be required to provide Health and Safety Plans for their employees working at the Site that meet the minimum standards set forth in Appendix D.

10. Reporting

Reporting associated with the remedial action shall consist of:

- Final Engineering Report (FER).
- Site Management Plan.

A construction completion report (CCR) will be prepared to document the completion of the remedy for Parcel 3, as this work will be completed before the remedy for Parcels 1 and 2 is complete.

10.1 Final Engineering Report

The FER will be submitted to the NYSDEC within 90 days following completion of the full Site remediation. It is anticipated that remediation of Parcel 3 will be completed before remediation of Parcels 1 and 2, and a CCR for Parcel 3 will have been completed in the interim.

The FER will include:

- Descriptions of all work performed and reference to the CCR for Parcel 3.
- Descriptions of deviations from the Work Plan with explanations of why the deviations were required.
- An evaluation of the satisfaction of the remedial goals and objectives.
- "As Built" drawings delineating the area(s) excavated and restored, underground utilities relocated (if any), area of in situ groundwater treatment, and remaining appurtenances.

The report shall be prepared in accordance with DER 10.

10.2 Site Management Plan

The SMP shall be prepared as previously discussed in Section 8.0.

11. Schedule

The estimated project schedule is presented on Figure 11.1.

Actual scheduling and sequencing of project activities will be revised, as necessary, based on approvals, contractor availability, etc. The schedule will be adjusted as preparations proceed, and NYSDEC will be advised at least 7 days prior to beginning a new activity.

12. Certification

I, Richard J. Snyder, P.E., certify that I am currently a NYS registered professional engineer as defined in 6 NYCRR Part 375, and that this Remedial Action Work plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

Signature: _____



Date: _____

July 13, 2022

Tables

Table 1

Analytical Results Summary - Soil
Pre-Design Investigation
1130 Niagara Street Site (C915284)
Buffalo, New York

Location ID: Sample Name: Sample Date: Depth:		GP-C-1 S-11219347-111620-AMC-140 11/16/2020 6-8 ft. bgs		GP-C-1 S-11219347-111620-AMC-141 11/16/2020 8-10 ft. bgs		GP-C-1 S-11219347-111620-AMC-142 11/16/2020 10-12 ft. bgs		GP-C-1 S-11219347-111620-AMC-143 11/16/2020 12-14 ft. bgs		GP-C-1 S-11219347-111620-AMC-144 11/16/2020 14-15.7 ft. bgs		GP-C-1 S-11219347-111620-AMC-145 11/16/2020 14.8-15.6 ft. bgs		GP-1-1 S-11219347-111220-AMC-090 11/12/2020 4-6 ft. bgs	
Parameters	Unit	NYSDEC Part 375 RUSCO - C	NYSDEC Part 375 PoGW												
Volatile Organic Compounds															
1,1,1-Trichloroethane	µg/kg	500000	680	7600	7900000	770000		140000	5300	-					180 J
1,1,2,2-Tetrachloroethane	µg/kg	-	-	200 U	250000 U	25000 U		19000 U	1400 U	-					200 U
1,1,2-Trichloroethane	µg/kg	-	-	200 U	250000 U	25000 U		19000 U	1400 U	-					200 U
1,1-Dichloroethane	µg/kg	240000	270	120 J	250000 U	25000 U		19000 U	1400 U	-					200 U
1,1-Dichloroethene	µg/kg	500000	330	580	190000 J	98000		47000	3800	-					89 J
1,2,4-Trichlorobenzene	µg/kg	-	-	200 U	250000 U	25000 U		19000 U	1400 U	-					200 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	-	-	200 U	250000 U	25000 U		19000 U	1400 U	-					200 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	-	-	200 U	250000 U	25000 U		19000 U	1400 U	-					200 U
1,2-Dichlorobenzene	µg/kg	500000	1100	200 U	250000 U	25000 U		19000 U	1400 U	-					200 U
1,2-Dichloroethane	µg/kg	30000	20	200 U	250000 U	25000 U		19000 U	1400 U	-					200 U
1,2-Dichloropropane	µg/kg	-	-	200 U	250000 U	25000 U		19000 U	1400 U	-					200 U
1,3-Dichlorobenzene	µg/kg	280000	2400	200 U	250000 U	25000 U		19000 U	1400 U	-					200 U
1,4-Dichlorobenzene	µg/kg	130000	1800	200 U	250000 U	25000 U		19000 U	1400 U	-					200 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	500000	120	1000 U	1200000 U	120000 U		96000 U	6800 U	-					980 U
2-Hexanone	µg/kg	-	-	1000 U	1200000 U	120000 U		96000 U	6800 U	-					980 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	-	-	1000 U	1200000 U	120000 U		96000 U	6800 U	-					980 U
Acetone	µg/kg	500000	50	1000 U	1200000 U	120000 U		96000 U	6800 U	-					980 U
Benzene	µg/kg	44000	60	200 U	250000 U	25000 U		19000 U	1400 U	-					200 U
Bromodichloromethane	µg/kg	-	-	200 U	250000 U	25000 U		19000 U	1400 U	-					200 U
Bromoform	µg/kg	-	-	200 U	250000 U	25000 U		19000 U	1400 U	-					200 U
Bromomethane (Methyl bromide)	µg/kg	-	-	200 U	250000 U	25000 U		19000 U	1400 U	-					200 U
Carbon disulfide	µg/kg	-	-	200 U	250000 U	25000 U		19000 U	1400 U	-					200 U
Carbon tetrachloride	µg/kg	22000	760	200 U	250000 U	25000 U		19000 U	1400 U	-					200 U
Chlorobenzene	µg/kg	500000	1100	200 U	250000 U	25000 U		19000 U	1400 U	-					200 U
Chloroethane	µg/kg	-	-	200 U	250000 U	25000 U		19000 U	1400 U	-					200 U
Chloroform (Trichloromethane)	µg/kg	350000	370	200 U	250000 U	25000 U		19000 U	1400 U	-					200 U
Chloromethane (Methyl chloride)	µg/kg	-	-	200 U	250000 U	25000 U		19000 U	1400 U	-					200 U
cis-1,2-Dichloroethene	µg/kg	500000	250	220	250000 U	25000 U		19000 U	1400 U	-					510
cis-1,3-Dichloropropene	µg/kg	-	-	200 U	250000 U	25000 U		19000 U	1400 U	-					200 U
Cyclohexane	µg/kg	-	-	200 U	250000 U	25000 U		19000 U	1400 U	-					200 U
Dibromochloromethane	µg/kg	-	-	200 U	250000 U	25000 U		19000 U	1400 U	-					200 U
Dichlorodifluoromethane (CFC-12)	µg/kg	-	-	200 U	250000 U	25000 U		19000 U	1400 U	-					200 U
Ethylbenzene	µg/kg	390000	1000	200 U	250000 U	25000 U		19000 U	1400 U	-					200 U
Isopropyl benzene	µg/kg	-	-	200 U	250000 U	25000 U		19000 U	1400 U	-					200 U
Methyl acetate	µg/kg	-	-	1000 U	1200000 U	120000 U		96000 U	6800 U	-					980 U
Methyl cyclohexane	µg/kg	-	-	200 U	250000 U	25000 U		19000 U	1400 U	-					200 U
Methyl tert butyl ether (MTBE)	µg/kg	500000	930	200 U	250000 U	25000 U		19000 U	1400 U	-					200 U
Methylene chloride	µg/kg	500000	50	200 U	250000 U	25000 U		19000 U	1400 U	-					200 U
Styrene	µg/kg	-	-	200 U	250000 U	25000 U		19000 U	1400 U	-					200 U
Tetrachloroethene	µg/kg	150000	1300	200 U	250000 U	25000 U		19000 U	1400 U	-					200 U
Toluene	µg/kg	500000	700	200 U	250000 U	25000 U		19000 U	1400 U	-					200 U
trans-1,2-Dichloroethene	µg/kg	500000	190	200 U	250000 U	25000 U		19000 U	1400 U	-					200 U
trans-1,3-Dichloropropene	µg/kg	-	-	200 U	250000 U	25000 U		19000 U	1400 U	-					200 U
Trichloroethene	µg/kg	200000	470	5900	2700000	1300000		720000	47000	-					9000
Trichlorofluoromethane (CFC-11)	µg/kg	-	-	200 U	250000 U	25000 U		19000 U	1400 U	-					200 U
Trifluorotrichloroethane (CFC-113)	µg/kg	-	-	200 U	250000 U	25000 U		19000 U	1400 U	-					200 U
Vinyl chloride	µg/kg	13000	20	200 U	250000 U	25000 U		19000 U	1400 U	-					200 U
Xylenes (total)	µg/kg	500000	1600	410 U	500000 U	50000 U		39000 U	2700 U	-					390 U
General Chemistry															
Fraction organic carbon (FOC)	%	-	-	-	-	-		-	-	0.3					-

Notes:

- J - Estimated concentration
- U - Not detected at the associated reporting limit
- UJ - Not detected; associated reporting limit is estimated
- R - Rejected
- ft bgs - Feet Below Ground Surface
- " - " Not applicable
- 2700000 Exceeds Part 375 RUSCO-C criteria
- Exceeds 1,000 ug/kg cleanup goal
- 470 Exceeds Part 375 PoGW criteria

Table 1

Analytical Results Summary - Soil
Pre-Design Investigation
1130 Niagara Street Site (C915284)
Buffalo, New York

Location ID:		GP-1-1		GP-1-1		GP-7-1		GP-7-1		GP-7-1		GP-8-1		GP-8-1			
Sample Name:		S-11219347-111220-AMC-091		S-11219347-111220-AMC-092		S-11219347-111220-AMC-093		S-11219347-111220-AMC-094		S-11219347-111220-AMC-095		S-11219347-111320-AMC-119		S-11219347-111320-AMC-120		S-11219347-111320-AMC-121	
Sample Date:		11/12/2020		11/12/2020		11/12/2020		11/12/2020		11/12/2020		11/13/2020		11/13/2020		11/13/2020	
Depth:		6-8 ft. bgs		8-8.9 ft. bgs		8-10 ft. bgs		8-10 ft. bgs		10-11.9 ft. bgs		9.5-11 ft. bgs		9.5-11 ft. bgs		11-13 ft. bgs	
Parameters		Unit						Duplicate									
Volatile Organic Compounds																	
1,1,1-Trichloroethane	µg/kg	7000		31000		140		140		690		130		150		250	
1,1,2,2-Tetrachloroethane	µg/kg	5600 U		5000 U		100 U		110 U		210 U		51 U		56 U		51 U	
1,1,2-Trichloroethane	µg/kg	5600 U		5000 U		100 U		110 U		210 U		51 U		56 U		51 U	
1,1-Dichloroethane	µg/kg	5600 U		5000 U		100 U		110 U		210 U		51 U		56 U		51 U	
1,1-Dichloroethene	µg/kg	5600 U		2800 J		48 J		48 J		120 J		51 U		56 U		24 J	
1,2,4-Trichlorobenzene	µg/kg	5600 U		5000 U		100 U		110 U		210 U		51 U		56 U		51 U	
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	5600 U		5000 U		100 U		110 U		210 U		51 U		56 U		51 U	
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	5600 U		5000 U		100 U		110 U		210 U		51 U		56 U		51 U	
1,2-Dichlorobenzene	µg/kg	5600 U		5000 U		100 U		110 U		210 U		51 U		56 U		51 U	
1,2-Dichloroethane	µg/kg	5600 U		5000 U		100 U		110 U		210 U		51 U		56 U		51 U	
1,2-Dichloropropane	µg/kg	5600 U		5000 U		100 U		110 U		210 U		51 U		56 U		51 U	
1,3-Dichlorobenzene	µg/kg	5600 U		5000 U		100 U		110 U		210 U		51 U		56 U		51 U	
1,4-Dichlorobenzene	µg/kg	5600 U		5000 U		100 U		110 U		210 U		51 U		56 U		51 U	
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	28000 U		25000 U		510 U		540 U		1100 U		250 U		280 U		260 U	
2-Hexanone	µg/kg	28000 U		25000 U		510 U		540 U		1100 U		250 U		280 U		260 U	
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	28000 U		25000 U		510 U		540 U		1100 U		250 U		280 U		260 U	
Acetone	µg/kg	28000 U		25000 U		510 U		540 U		1100 U		250 U		280 U		260 U	
Benzene	µg/kg	5600 U		5000 U		100 U		110 U		210 U		51 U		56 U		51 U	
Bromodichloromethane	µg/kg	5600 U		5000 U		100 U		110 U		210 U		51 U		56 U		51 U	
Bromoform	µg/kg	5600 U		5000 U		100 U		110 U		210 U		51 U		56 U		51 U	
Bromomethane (Methyl bromide)	µg/kg	5600 U		5000 U		100 U		110 U		210 U		51 U		56 U		51 U	
Carbon disulfide	µg/kg	5600 U		5000 U		100 U		110 U		210 U		51 U		56 U		51 U	
Carbon tetrachloride	µg/kg	5600 U		5000 U		100 U		110 U		210 U		51 U		56 U		51 U	
Chlorobenzene	µg/kg	5600 U		5000 U		100 U		110 U		210 U		51 U		56 U		51 U	
Chloroethane	µg/kg	5600 U		5000 U		100 U		110 U		210 U		51 U		56 U		51 U	
Chloroform (Trichloromethane)	µg/kg	5600 U		5000 U		100 U		110 U		210 U		51 U		56 U		51 U	
Chloromethane (Methyl chloride)	µg/kg	5600 U		5000 U		100 U		110 U		210 U		51 U		56 U		51 U	
cis-1,2-Dichloroethene	µg/kg	5600 U		5000 U		100 U		110 U		210 U		51 U		56 U		51 U	
cis-1,3-Dichloropropene	µg/kg	5600 U		5000 U		100 U		110 U		210 U		51 U		56 U		51 U	
Cyclohexane	µg/kg	5600 U		5000 U		100 U		110 U		210 U		51 U		56 U		51 U	
Dibromochloromethane	µg/kg	5600 U		5000 U		100 U		110 U		210 U		51 U		56 U		51 U	
Dichlorodifluoromethane (CFC-12)	µg/kg	5600 U		5000 U		100 U		110 U		210 U		51 U		56 U		51 U	
Ethylbenzene	µg/kg	5600 U		5000 U		100 U		110 U		210 U		51 U		56 U		51 U	
Isopropyl benzene	µg/kg	5600 U		5000 U		100 U		110 U		210 U		51 U		56 U		51 U	
Methyl acetate	µg/kg	28000 U		25000 U		510 U		540 U		1100 U		250 U		280 U		260 U	
Methyl cyclohexane	µg/kg	5600 U		5000 U		100 U		110 U		210 U		51 U		56 U		51 U	
Methyl tert butyl ether (MTBE)	µg/kg	5600 U		5000 U		100 U		110 U		210 U		51 U		56 U		51 U	
Methylene chloride	µg/kg	5600 U		5000 U		100 U		110 U		210 U		51 U		56 U		51 U	
Styrene	µg/kg	5600 U		5000 U		100 U		110 U		210 U		51 U		56 U		51 U	
Tetrachloroethene	µg/kg	5600 U		5000 U		100 U		55 J		120 J		51 U		56 U		51 U	
Toluene	µg/kg	5600 U		5000 U		100 U		110 U		210 U		51 U		56 U		51 U	
trans-1,2-Dichloroethene	µg/kg	5600 U		5000 U		100 U		110 U		210 U		51 U		56 U		51 U	
trans-1,3-Dichloropropene	µg/kg	5600 U		5000 U		100 U		110 U		210 U		51 U		56 U		51 U	
Trichloroethene	µg/kg	140000		170000		3100		2900		10000		380		400		890	
Trichlorofluoromethane (CFC-11)	µg/kg	5600 U		5000 U		100 U		110 U		210 U		51 U		56 U		51 U	
Trifluorotrichloroethane (CFC-113)	µg/kg	5600 U		5000 U		100 U		110 U		210 U		51 U		56 U		51 U	
Vinyl chloride	µg/kg	5600 U		5000 U		100 U		110 U		210 U		51 U		56 U		51 U	
Xylenes (total)	µg/kg	11000 U		10000 U		210 U		210 U		430 U		100 U		110 U		100 U	
General Chemistry																	
Fraction organic carbon (FOC)	%	-		-		-		-		-		-		-		-	

Table 1

Analytical Results Summary - Soil
Pre-Design Investigation
1130 Niagara Street Site (C915284)
Buffalo, New York

Location ID:		GP-8-1		GP-8-1		GP-14-1		GP-14-1		GP-14-1		GP-14-1		GP-19-1			
Sample Name:		S-11219347-111320-AMC-122		S-11219347-111320-AMC-123		S-11219347-111620-AMC-135		S-11219347-111620-AMC-136		S-11219347-111620-AMC-137		S-11219347-111620-AMC-138		S-11219347-111620-AMC-139		S-11219347-111620-AMC-129	
Sample Date:		11/13/2020		11/13/2020		11/16/2020		11/16/2020		11/16/2020		11/16/2020		11/16/2020		11/16/2020	
Depth:		13-15 ft. bgs		15-16.1 ft. bgs		6-8 ft. bgs		8-10 ft. bgs		10-12 ft. bgs		12-14 ft. bgs		14-15.8 ft. bgs		6-8 ft. bgs	
Parameters		Unit															
Volatile Organic Compounds																	
1,1,1-Trichloroethane	µg/kg	1100	1100		51 J		42 J		53		900		180		4500		
1,1,2,2-Tetrachloroethane	µg/kg	51 U	55 U		61 U		54 U		51 U		450 U		100 U		630 U		
1,1,2-Trichloroethane	µg/kg	51 U	55 U		61 U		54 U		51 U		450 U		100 U		630 U		
1,1-Dichloroethane	µg/kg	46 J	61		61 U		54 U		51 U		450 U		100 U		430 J		
1,1-Dichloroethene	µg/kg	150	290		61 U		54 U		51 U		450 U		180		2400		
1,2,4-Trichlorobenzene	µg/kg	51 U	55 U		61 U		54 U		51 U		450 U		100 U		630 U		
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	51 U	55 U		61 U		54 U		51 U		450 U		100 U		630 U		
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	51 U	55 U		61 U		54 U		51 U		450 U		100 U		630 U		
1,2-Dichlorobenzene	µg/kg	51 U	55 U		61 U		54 U		51 U		450 U		100 U		630 U		
1,2-Dichloroethane	µg/kg	51 U	55 U		61 U		54 U		51 U		450 U		100 U		630 U		
1,2-Dichloropropane	µg/kg	51 U	55 U		61 U		54 U		51 U		450 U		100 U		630 U		
1,3-Dichlorobenzene	µg/kg	51 U	55 U		61 U		54 U		51 U		450 U		100 U		630 U		
1,4-Dichlorobenzene	µg/kg	51 U	55 U		61 U		54 U		51 U		450 U		100 U		630 U		
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	260 U	280 U	300 U	270 U	260 U	2300 U	510 U	3200 U								
2-Hexanone	µg/kg	260 U	280 U	300 U	270 U	260 U	2300 U	510 U	3200 U								
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	260 U	280 U	300 U	270 U	260 U	2300 U	510 U	3200 U								
Acetone	µg/kg	260 U	280 U	300 U	270 U	260 U	2300 U	510 U	3200 U								
Benzene	µg/kg	51 U	55 U	61 U	54 U	51 U	450 U	100 U	630 U								
Bromodichloromethane	µg/kg	51 U	55 U	61 U	54 U	51 U	450 U	100 U	630 U								
Bromoform	µg/kg	51 U	55 U	61 U	54 U	51 U	450 U	100 U	630 U								
Bromomethane (Methyl bromide)	µg/kg	51 U	55 U	61 U	54 U	51 U	450 U	100 U	630 U								
Carbon disulfide	µg/kg	51 U	55 U	61 U	54 U	51 U	450 U	100 U	630 U								
Carbon tetrachloride	µg/kg	51 U	55 U	61 U	54 U	51 U	450 U	100 U	630 U								
Chlorobenzene	µg/kg	51 U	55 U	61 U	54 U	51 U	450 U	100 U	630 U								
Chloroethane	µg/kg	51 U	55 U	61 U	54 U	51 U	450 U	100 U	630 U								
Chloroform (Trichloromethane)	µg/kg	51 U	55 U	61 U	54 U	51 U	450 U	100 U	630 U								
Chloromethane (Methyl chloride)	µg/kg	51 U	55 U	61 U	54 U	51 U	450 U	100 U	630 U								
cis-1,2-Dichloroethene	µg/kg	160	220	21 J	58	61	450 U	29 J	600 J								
cis-1,3-Dichloropropene	µg/kg	51 U	55 U	61 U	54 U	51 U	450 U	100 U	630 U								
Cyclohexane	µg/kg	51 U	55 U	61 U	54 U	51 U	450 U	100 U	630 U								
Dibromochloromethane	µg/kg	51 U	55 U	61 U	54 U	51 U	450 U	100 U	630 U								
Dichlorodifluoromethane (CFC-12)	µg/kg	51 U	55 U	61 U	54 U	51 U	450 U	100 U	630 U								
Ethylbenzene	µg/kg	51 U	55 U	61 U	54 U	51 U	450 U	100 U	630 U								
Isopropyl benzene	µg/kg	51 U	55 U	61 U	54 U	51 U	450 U	100 U	630 U								
Methyl acetate	µg/kg	260 U	280 U	300 U	270 U	260 U	2300 U	510 U	3200 U								
Methyl cyclohexane	µg/kg	51 U	55 U	61 U	54 U	51 U	450 U	100 U	630 U								
Methyl tert butyl ether (MTBE)	µg/kg	51 U	55 U	61 U	54 U	51 U	450 U	100 U	630 U								
Methylene chloride	µg/kg	51 U	55 U	61 U	21 J	51 U	450 U	100 U	630 U								
Styrene	µg/kg	51 U	55 U	61 U	54 U	51 U	450 U	100 U	630 U								
Tetrachloroethene	µg/kg	51 U	55 U	61 U	54 U	51 U	450 U	35 J	630 U								
Toluene	µg/kg	51 U	55 U	61 U	18 J	51 U	450 U	100 U	630 U								
trans-1,2-Dichloroethene	µg/kg	51 U	55 U	61 U	54 U	51 U	450 U	100 U	630 U								
trans-1,3-Dichloropropene	µg/kg	51 U	55 U	61 U	54 U	51 U	450 U	100 U	630 U								
Trichloroethene	µg/kg	4300	4700	790	610	770	18000	4100	28000								
Trichlorofluoromethane (CFC-11)	µg/kg	51 U	55 U	61 U	54 U	51 U	450 U	100 U	630 U								
Trifluorotrichloroethane (CFC-113)	µg/kg	51 U	55 U	61 U	54 U	51 U	450 U	100 U	630 U								
Vinyl chloride	µg/kg	51 U	55 U	61 U	54 U	51 U	450 U	100 U	630 U								
Xylenes (total)	µg/kg	100 U	110 U	120 U	110 U	100 U	910 U	200 U	1300 U								
General Chemistry																	
Fraction organic carbon (FOC)	%	-	-	-	-	-	-	-	-								

Table 1

Analytical Results Summary - Soil
Pre-Design Investigation
1130 Niagara Street Site (C915284)
Buffalo, New York

Location ID:		GP-19-1	GP-19-1	GP-19-1	GP-19-1	GP-19-1	GP-23-1	GP-23-1	GP-23-1
Sample Name:		S-11219347-111620-AMC-130	S-11219347-111620-AMC-131	S-11219347-111620-AMC-132	S-11219347-111620-AMC-133	S-11219347-111620-AMC-134	S-11219347-111620-AMC-146	S-11219347-111620-AMC-147	S-11219347-111620-AMC-148
Sample Date:		11/16/2020	11/16/2020	11/16/2020	11/16/2020	11/16/2020	11/16/2020	11/16/2020	11/16/2020
Depth:		8-10 ft. bgs	10-12 ft. bgs	12-14 ft. bgs	14-16 ft. bgs	14-16 ft. bgs Duplicate	6-8 ft. bgs	8-10 ft. bgs	8-10 ft. bgs Duplicate
Parameters	Unit								
Volatile Organic Compounds									
1,1,1-Trichloroethane	µg/kg	11000	14000	5300	78000 J	9400 J	50 UJ	41 J	56
1,1,2,2-Tetrachloroethane	µg/kg	1000 U	1300 U	4600 U	48000 U	21000 U	50 U	49 U	48 U
1,1,2-Trichloroethane	µg/kg	1000 U	1300 U	4600 U	48000 U	21000 U	50 U	49 U	48 U
1,1-Dichloroethane	µg/kg	1000 U	1300 U	4600 U	48000 U	21000 U	50 U	49 U	48 U
1,1-Dichloroethene	µg/kg	1700	3100	3600 J	24000 J	21000 U	50 UJ	49 U	48 U
1,2,4-Trichlorobenzene	µg/kg	1000 U	1300 U	4600 U	48000 U	21000 U	50 UJ	49 U	48 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	1000 U	1300 U	4600 U	48000 U	21000 U	50 U	49 U	48 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	1000 U	1300 U	4600 U	48000 U	21000 U	50 U	49 U	48 U
1,2-Dichlorobenzene	µg/kg	1000 U	1300 U	4600 U	48000 U	21000 U	50 UJ	49 U	48 U
1,2-Dichloroethane	µg/kg	1000 U	1300 U	4600 U	48000 U	21000 U	50 U	49 U	48 U
1,2-Dichloropropane	µg/kg	1000 U	1300 U	4600 U	48000 U	21000 U	50 U	49 U	48 U
1,3-Dichlorobenzene	µg/kg	1000 U	1300 U	4600 U	48000 U	21000 U	50 UJ	49 U	48 U
1,4-Dichlorobenzene	µg/kg	1000 U	1300 U	4600 U	48000 U	21000 U	50 UJ	49 U	48 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	5200 U	6500 U	23000 U	240000 U	110000 U	250 U	250 U	240 U
2-Hexanone	µg/kg	5200 U	6500 U	23000 U	240000 U	110000 U	250 U	250 U	240 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	5200 U	6500 U	23000 U	240000 U	110000 U	250 U	250 U	240 U
Acetone	µg/kg	5200 U	6500 U	23000 U	240000 U	110000 U	250 U	250 U	240 U
Benzene	µg/kg	1000 U	1300 U	4600 U	48000 U	21000 U	50 UJ	49 U	48 U
Bromodichloromethane	µg/kg	1000 U	1300 U	4600 U	48000 U	21000 U	50 U	49 U	48 U
Bromoform	µg/kg	1000 U	1300 U	4600 U	48000 U	21000 U	50 U	49 U	48 U
Bromomethane (Methyl bromide)	µg/kg	1000 U	1300 U	4600 U	48000 U	21000 U	50 UJ	49 U	48 U
Carbon disulfide	µg/kg	1000 U	1300 U	4600 U	48000 U	21000 U	50 UJ	49 U	48 U
Carbon tetrachloride	µg/kg	1000 U	1300 U	4600 U	48000 U	21000 U	50 UJ	49 U	48 U
Chlorobenzene	µg/kg	1000 U	1300 U	4600 U	48000 U	21000 U	50 UJ	49 U	48 U
Chloroethane	µg/kg	1000 U	1300 U	4600 U	48000 U	21000 U	50 UJ	49 U	48 U
Chloroform (Trichloromethane)	µg/kg	1000 U	1300 U	4600 U	48000 U	21000 U	50 U	49 U	48 U
Chloromethane (Methyl chloride)	µg/kg	1000 U	1300 U	4600 U	48000 U	21000 U	50 UJ	49 U	48 U
cis-1,2-Dichloroethene	µg/kg	480 J	740 J	4600 U	48000 U	21000 U	48 J	32 J	29 J
cis-1,3-Dichloropropene	µg/kg	1000 U	1300 U	4600 U	48000 U	21000 U	50 U	49 U	48 U
Cyclohexane	µg/kg	1000 U	1300 U	4600 U	48000 U	21000 U	R	49 U	48 U
Dibromochloromethane	µg/kg	1000 U	1300 U	4600 U	48000 U	21000 U	50 U	49 U	48 U
Dichlorodifluoromethane (CFC-12)	µg/kg	1000 U	1300 U	4600 U	48000 U	21000 U	R	49 U	48 U
Ethylbenzene	µg/kg	1000 U	1300 U	4600 U	48000 U	21000 U	50 UJ	49 U	48 U
Isopropyl benzene	µg/kg	1000 U	1300 U	4600 U	48000 U	21000 U	50 UJ	49 U	48 U
Methyl acetate	µg/kg	5200 U	6500 U	23000 U	240000 U	110000 U	250 U	250 U	240 U
Methyl cyclohexane	µg/kg	1000 U	1300 U	4600 U	48000 U	21000 U	R	49 U	48 U
Methyl tert butyl ether (MTBE)	µg/kg	1000 U	1300 U	4600 U	48000 U	21000 U	50 U	49 U	48 U
Methylene chloride	µg/kg	1000 U	1300 U	4600 U	48000 U	21000 U	50 U	49 U	48 U
Styrene	µg/kg	1000 U	1300 U	4600 U	48000 U	21000 U	50 UJ	49 U	48 U
Tetrachloroethene	µg/kg	1000 U	1300 U	4600 U	48000 U	21000 U	50 UJ	49 U	48 U
Toluene	µg/kg	1000 U	1300 U	4600 U	48000 U	21000 U	50 UJ	49 U	48 U
trans-1,2-Dichloroethene	µg/kg	1000 U	1300 U	4600 U	48000 U	21000 U	50 UJ	49 U	48 U
trans-1,3-Dichloropropene	µg/kg	1000 U	1300 U	4600 U	48000 U	21000 U	50 U	49 U	48 U
Trichloroethene	µg/kg	28000	46000	130000	2200000 J	430000 J	490 J	460	690
Trichlorofluoromethane (CFC-11)	µg/kg	1000 U	1300 U	4600 U	48000 U	21000 U	R	49 U	48 U
Trifluorotrichloroethane (CFC-113)	µg/kg	1000 U	1300 U	4600 U	48000 U	21000 U	R	49 U	48 U
Vinyl chloride	µg/kg	1000 U	1300 U	4600 U	48000 U	21000 U	R	49 U	48 U
Xylenes (total)	µg/kg	2100 U	2600 U	9200 U	96000 U	42000 U	99 U	99 U	97 U
General Chemistry									
Fraction organic carbon (FOC)	%	-	-	-	-	-	-	-	-

Notes:

- J - Estimated concentration
- U - Not detected at the associated reporting limit
- UJ - Not detected; associated reporting limit is estimated
- R - Rejected
- ft bgs - Feet Below Ground Surface
- " - " Not applicable
- 2700000 Exceeds Part 375 RUSCO-C criteria
- Exceeds 1,000 ug/kg cleanup goal
- 470 Exceeds Part 375 PoGW criteria

Table 1

Analytical Results Summary - Soil
Pre-Design Investigation
1130 Niagara Street Site (C915284)
Buffalo, New York

Location ID: Sample Name: Sample Date: Depth:		GP-23-1 S-11219347-111620-AMC-149 11/16/2020 10-12 ft. bgs	GP-23-1 S-11219347-111620-AMC-150 11/16/2020 12-14 ft. bgs	GP-23-1 S-11219347-111620-AMC-151 11/16/2020 14-16.4 ft. bgs	GP-24-1 S-11219347-111120-AMC-072 11/11/2020 7-9 ft. bgs	GP-24-1 S-11219347-111120-AMC-073 11/11/2020 9-11 ft. bgs	GP-24-1 S-11219347-111120-AMC-074 11/11/2020 11-13 ft. bgs	GP-24-1 S-11219347-111120-AMC-075 11/11/2020 13-15 ft. bgs	GP-24-1 S-11219347-111120-AMC-076 11/11/2020 15-16.1 ft. bgs
Parameters	Unit								
Volatile Organic Compounds									
1,1,1-Trichloroethane	µg/kg	61	74	29 J	23 J	23 J	15 J	410 J	5700 J
1,1,2,2-Tetrachloroethane	µg/kg	49 U	49 U	45 U	57 U	49 U	47 U	480 U	11000 U
1,1,2-Trichloroethane	µg/kg	49 U	49 U	45 U	57 U	49 U	47 U	480 U	11000 U
1,1-Dichloroethane	µg/kg	49 U	49 U	45 U	57 U	49 U	47 U	480 U	11000 U
1,1-Dichloroethene	µg/kg	49 U	49 U	27 J	57 U	49 U	47 U	510	6400 J
1,2,4-Trichlorobenzene	µg/kg	49 U	49 U	45 U	57 U	49 U	47 U	480 U	11000 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	49 U	49 U	45 U	57 U	49 U	47 U	480 U	11000 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	49 U	49 U	45 U	57 U	49 U	47 U	480 U	11000 U
1,2-Dichlorobenzene	µg/kg	49 U	49 U	45 U	57 U	49 U	47 U	480 U	11000 U
1,2-Dichloroethane	µg/kg	49 U	49 U	45 U	57 U	49 U	47 U	480 U	11000 U
1,2-Dichloropropane	µg/kg	49 U	49 U	45 U	57 U	49 U	47 U	480 U	11000 U
1,3-Dichlorobenzene	µg/kg	49 U	49 U	45 U	57 U	49 U	47 U	480 U	11000 U
1,4-Dichlorobenzene	µg/kg	49 U	49 U	45 U	57 U	49 U	47 U	480 U	11000 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	250 U	240 U	230 U	290 U	250 U	230 U	2400 U	56000 U
2-Hexanone	µg/kg	250 U	240 U	230 U	290 U	250 U	230 U	2400 U	56000 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	250 U	240 U	230 U	290 U	250 U	230 U	2400 U	56000 U
Acetone	µg/kg	250 U	240 U	230 U	290 U	250 U	230 U	2400 U	56000 U
Benzene	µg/kg	49 U	49 U	45 U	57 U	49 U	47 U	480 U	11000 U
Bromodichloromethane	µg/kg	49 U	49 U	45 U	57 U	49 U	47 U	480 U	11000 U
Bromoform	µg/kg	49 U	49 U	45 U	57 U	49 U	47 U	480 U	11000 U
Bromomethane (Methyl bromide)	µg/kg	49 U	49 U	45 U	57 U	49 U	47 U	480 U	11000 U
Carbon disulfide	µg/kg	49 U	49 U	45 U	57 U	49 U	47 U	480 U	11000 U
Carbon tetrachloride	µg/kg	49 U	49 U	45 U	57 U	49 U	47 U	480 U	11000 U
Chlorobenzene	µg/kg	49 U	49 U	45 U	57 U	49 U	47 U	480 U	11000 U
Chloroethane	µg/kg	49 U	49 U	45 U	57 U	49 U	47 U	480 U	11000 U
Chloroform (Trichloromethane)	µg/kg	49 U	49 U	45 U	57 U	49 U	47 U	480 U	11000 U
Chloromethane (Methyl chloride)	µg/kg	49 U	49 U	45 U	57 U	49 U	47 U	480 U	11000 U
cis-1,2-Dichloroethene	µg/kg	49 U	20 J	45 U	57 U	49 U	47 U	200 J	11000 U
cis-1,3-Dichloropropene	µg/kg	49 U	49 U	45 U	57 U	49 U	47 U	480 U	11000 U
Cyclohexane	µg/kg	49 U	49 U	45 U	57 U	49 U	47 U	480 U	11000 U
Dibromochloromethane	µg/kg	49 U	49 U	45 U	57 U	49 U	47 U	480 U	11000 U
Dichlorodifluoromethane (CFC-12)	µg/kg	49 U	49 U	45 U	57 U	49 U	47 U	480 U	11000 U
Ethylbenzene	µg/kg	49 U	49 U	45 U	57 U	49 U	47 U	480 U	11000 U
Isopropyl benzene	µg/kg	49 U	49 U	45 U	57 U	49 U	47 U	480 U	11000 U
Methyl acetate	µg/kg	250 U	240 U	230 U	290 U	250 U	230 U	2400 U	56000 U
Methyl cyclohexane	µg/kg	49 U	49 U	45 U	57 U	49 U	47 U	480 U	11000 U
Methyl tert butyl ether (MTBE)	µg/kg	49 U	49 U	45 U	57 U	49 U	47 U	480 U	11000 U
Methylene chloride	µg/kg	49 U	49 U	45 U	57 U	49 U	47 U	480 U	11000 U
Styrene	µg/kg	49 U	49 U	45 U	57 U	49 U	47 U	480 U	11000 U
Tetrachloroethene	µg/kg	49 U	49 U	45 U	57 U	49 U	47 U	480 U	11000 U
Toluene	µg/kg	49 U	49 U	45 U	57 U	49 U	47 U	480 U	11000 U
trans-1,2-Dichloroethene	µg/kg	49 U	49 U	45 U	57 U	49 U	47 U	480 U	11000 U
trans-1,3-Dichloropropene	µg/kg	49 U	49 U	45 U	57 U	49 U	47 U	480 U	11000 U
Trichloroethene	µg/kg	760	920	690	230	210	190	23000	330000
Trichlorofluoromethane (CFC-11)	µg/kg	49 U	49 U	45 U	57 U	49 U	47 U	480 U	11000 U
Trifluorotrichloroethane (CFC-113)	µg/kg	49 U	49 U	45 U	57 U	49 U	47 U	480 U	11000 U
Vinyl chloride	µg/kg	49 U	49 U	45 U	57 U	49 U	47 U	480 U	11000 U
Xylenes (total)	µg/kg	99 U	98 U	90 U	110 U	99 U	94 U	960 U	22000 U
General Chemistry									
Fraction organic carbon (FOC)	%	-	-	-	-	-	-	-	-

Notes:

- J - Estimated concentration
- U - Not detected at the associated reporting limit
- UJ - Not detected; associated reporting limit is estimated
- R - Rejected
- ft bgs - Feet Below Ground Surface
- " - " Not applicable
- 2700000 Exceeds Part 375 RUSCO-C criteria
- Exceeds 1,000 ug/kg cleanup goal
- 470 Exceeds Part 375 PoGW criteria

Table 1

Analytical Results Summary - Soil
Pre-Design Investigation
1130 Niagara Street Site (C915284)
Buffalo, New York

Location ID: Sample Name: Sample Date: Depth:		GP-30-1 S-11219347-111120-AMC-065 11/11/2020 4.5-6 ft. bgs	GP-30-1 S-11219347-111120-AMC-066 11/11/2020 6-8 ft. bgs	GP-30-1 S-11219347-111120-AMC-067 11/11/2020 8-10 ft. bgs	GP-30-1 S-11219347-111120-AMC-068 11/11/2020 10-12 ft. bgs	GP-30-1 S-11219347-111120-AMC-069 11/11/2020 12-14 ft. bgs	GP-30-1 S-11219347-111120-AMC-070 11/11/2020 14-16.6 ft. bgs	GP-31-1 S-11219347-111020-AMC-043 11/10/2020 6-8 ft. bgs	GP-31-1 S-11219347-111020-AMC-044 11/10/2020 6-8 ft. bgs Duplicate
Parameters	Unit								
Volatile Organic Compounds									
1,1,1-Trichloroethane	µg/kg	32 J	19 J	35 J	57	59	44 U	0.55 J	0.66 J
1,1,2,2-Tetrachloroethane	µg/kg	50 U	48 U	46 U	51 U	49 U	44 U	4.1 U	2.3 U
1,1,2-Trichloroethane	µg/kg	50 U	48 U	46 U	51 U	49 U	44 U	4.1 U	2.3 U
1,1-Dichloroethane	µg/kg	20 J	48 U	46 U	51 U	49 U	44 U	6.7	8.5
1,1-Dichloroethene	µg/kg	50 U	48 U	46 U	24 J	49 U	44 U	1.5 J	2.3
1,2,4-Trichlorobenzene	µg/kg	50 U	48 U	46 U	51 U	49 U	44 U	4.1 U	2.3 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	50 U	48 U	46 U	51 U	49 U	44 U	4.1 U	2.3 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	50 U	48 U	46 U	51 U	49 U	44 U	4.1 U	2.3 U
1,2-Dichlorobenzene	µg/kg	50 U	48 U	46 U	51 U	49 U	44 U	4.1 U	2.3 U
1,2-Dichloroethane	µg/kg	50 U	48 U	46 U	51 U	49 U	44 U	4.1 U	2.3 U
1,2-Dichloropropane	µg/kg	50 U	48 U	46 U	51 U	49 U	44 U	4.1 U	2.3 U
1,3-Dichlorobenzene	µg/kg	50 U	48 U	46 U	51 U	49 U	44 U	4.1 U	2.3 U
1,4-Dichlorobenzene	µg/kg	50 U	48 U	46 U	51 U	49 U	44 U	4.1 U	2.3 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	250 U	240 U	230 U	260 U	250 U	220 U	21 U	12 U
2-Hexanone	µg/kg	250 U	240 U	230 U	260 U	250 U	220 U	21 U	12 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	250 U	240 U	230 U	260 U	250 U	220 U	21 U	12 U
Acetone	µg/kg	250 U	240 U	230 U	260 U	250 U	220 U	21 U	12 U
Benzene	µg/kg	50 U	48 U	46 U	51 U	49 U	44 U	4.1 U	2.3 U
Bromodichloromethane	µg/kg	50 U	48 U	46 U	51 U	49 U	44 U	4.1 U	2.3 U
Bromoform	µg/kg	50 U	48 U	46 U	51 U	49 U	44 U	4.1 U	2.3 U
Bromomethane (Methyl bromide)	µg/kg	50 U	48 U	46 U	51 U	49 U	44 U	4.1 U	2.3 U
Carbon disulfide	µg/kg	50 U	48 U	46 U	51 U	49 U	44 U	4.1 U	2.3 U
Carbon tetrachloride	µg/kg	50 U	48 U	46 U	51 U	49 U	44 U	4.1 U	2.3 U
Chlorobenzene	µg/kg	50 U	48 U	46 U	51 U	49 U	44 U	4.1 U	2.3 U
Chloroethane	µg/kg	50 U	48 U	46 U	51 U	49 U	44 U	4.1 U	2.3 U
Chloroform (Trichloromethane)	µg/kg	50 U	48 U	46 U	51 U	49 U	44 U	4.1 U	2.3 U
Chloromethane (Methyl chloride)	µg/kg	50 U	48 U	46 U	51 U	49 U	44 U	4.1 U	2.3 U
cis-1,2-Dichloroethene	µg/kg	110	130	60	51 U	49 U	44 U	18	22
cis-1,3-Dichloropropene	µg/kg	50 U	48 U	46 U	51 U	49 U	44 U	4.1 U	2.3 U
Cyclohexane	µg/kg	50 U	48 U	46 U	51 U	49 U	44 U	4.1 U	2.3 U
Dibromochloromethane	µg/kg	50 U	48 U	46 U	51 U	49 U	44 U	4.1 U	2.3 U
Dichlorodifluoromethane (CFC-12)	µg/kg	50 U	48 U	46 U	51 U	49 U	44 U	4.1 U	2.3 U
Ethylbenzene	µg/kg	50 U	48 U	46 U	51 U	18 J	44 U	4.1 U	2.3 U
Isopropyl benzene	µg/kg	50 U	48 U	46 U	51 U	7.5 J	44 U	4.1 U	2.3 U
Methyl acetate	µg/kg	250 U	240 U	230 U	260 U	250 U	220 U	21 U	12 U
Methyl cyclohexane	µg/kg	50 U	48 U	46 U	51 U	49 U	44 U	4.1 U	2.3 U
Methyl tert butyl ether (MTBE)	µg/kg	50 U	48 U	46 U	51 U	49 U	44 U	4.1 U	2.3 U
Methylene chloride	µg/kg	50 U	48 U	46 U	51 U	49 U	44 U	4.1 U	2.3 U
Styrene	µg/kg	50 U	48 U	46 U	51 U	49 U	44 U	4.1 U	2.3 U
Tetrachloroethene	µg/kg	50 U	48 U	46 U	51 U	49 U	44 U	4.1 U	2.3 U
Toluene	µg/kg	50 U	48 U	46 U	51 U	49 U	44 U	4.1 U	2.3 U
trans-1,2-Dichloroethene	µg/kg	50 U	48 U	46 U	51 U	49 U	44 U	4.1 U	0.24 J
trans-1,3-Dichloropropene	µg/kg	50 U	48 U	46 U	51 U	49 U	44 U	4.1 U	2.3 U
Trichloroethene	µg/kg	720	440	410	630	680	540	20	23
Trichlorofluoromethane (CFC-11)	µg/kg	50 U	48 U	46 U	51 U	49 U	44 U	4.1 U	2.3 U
Trifluorotrichloroethane (CFC-113)	µg/kg	50 U	48 U	46 U	51 U	49 U	44 U	4.1 U	2.3 U
Vinyl chloride	µg/kg	50 U	48 U	46 U	51 U	49 U	44 U	13	16
Xylenes (total)	µg/kg	99 U	95 U	91 U	100 U	150	87 U	8.3 U	4.6 U
General Chemistry									
Fraction organic carbon (FOC)	%	-	-	-	-	-	-	-	-

Notes:

- J - Estimated concentration
- U - Not detected at the associated reporting limit
- UJ - Not detected; associated reporting limit is estimated
- R - Rejected
- ft bgs - Feet Below Ground Surface
- " - " Not applicable
- 2700000

Exceeds Part 375 RUSCO-C criteria
- Exceeds 1,000 ug/kg cleanup goal
- 470

Exceeds Part 375 PoGW criteria

Table 1

Analytical Results Summary - Soil
Pre-Design Investigation
1130 Niagara Street Site (C915284)
Buffalo, New York

Location ID: Sample Name: Sample Date: Depth:		GP-31-1 S-11219347-111020-AMC-045 11/10/2020 8-10 ft. bgs	GP-31-1 S-11219347-111020-AMC-046 11/10/2020 10-12 ft. bgs	GP-31-1 S-11219347-111020-AMC-047 11/10/2020 12-14 ft. bgs	GP-31-1 S-11219347-111020-AMC-048 11/10/2020 14-16.3 ft. bgs	GP-33-1 S-11219347-111120-AMC-051 11/11/2020 3-5 ft. bgs	GP-33-1 S-11219347-111120-AMC-052 11/11/2020 5-7 ft. bgs	GP-33-1 S-11219347-111120-AMC-053 11/11/2020 7-9 ft. bgs	GP-33-1 S-11219347-111120-AMC-054 11/11/2020 9-11 ft. bgs
Parameters	Unit								
Volatile Organic Compounds									
1,1,1-Trichloroethane	µg/kg	0.049 U	0.050 U	0.050 U	0.057 U	-	130 U	39 J	100
1,1,2,2-Tetrachloroethane	µg/kg	0.049 U	0.050 U	0.050 U	0.057 U	-	130 U	43 U	52 U
1,1,2-Trichloroethane	µg/kg	0.049 U	0.050 U	0.050 U	0.057 U	-	130 U	43 U	52 U
1,1-Dichloroethane	µg/kg	0.049 U	0.050 U	0.050 U	0.057 U	-	100 J	41 J	42 J
1,1-Dichloroethene	µg/kg	0.049 U	0.050 U	0.050 U	0.057 U	-	330	95	34 J
1,2,4-Trichlorobenzene	µg/kg	0.049 U	0.050 U	0.050 U	0.057 U	-	130 U	43 U	52 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	0.049 U	0.050 U	0.050 U	0.057 U	-	130 U	43 U	52 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	0.049 U	0.050 U	0.050 U	0.057 U	-	130 U	43 U	52 U
1,2-Dichlorobenzene	µg/kg	0.049 U	0.050 U	0.050 U	0.057 U	-	130 U	43 U	52 U
1,2-Dichloroethane	µg/kg	0.049 U	0.050 U	0.050 U	0.057 U	-	130 U	43 U	52 U
1,2-Dichloropropane	µg/kg	0.049 U	0.050 U	0.050 U	0.057 U	-	130 U	43 U	52 U
1,3-Dichlorobenzene	µg/kg	0.049 U	0.050 U	0.050 U	0.057 U	-	130 U	43 U	52 U
1,4-Dichlorobenzene	µg/kg	0.049 U	0.050 U	0.050 U	0.057 U	-	130 U	43 U	52 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	0.25 U	0.25 U	0.25 U	0.28 U	-	630 U	220 U	260 U
2-Hexanone	µg/kg	0.25 U	0.25 U	0.25 U	0.28 U	-	630 U	220 U	260 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	0.25 U	0.25 U	0.25 U	0.28 U	-	630 U	220 U	260 U
Acetone	µg/kg	0.25 U	0.25 U	0.25 U	0.28 U	-	630 U	220 U	260 U
Benzene	µg/kg	0.049 U	0.050 U	0.050 U	0.057 U	-	130 U	43 U	52 U
Bromodichloromethane	µg/kg	0.049 U	0.050 U	0.050 U	0.057 U	-	130 U	43 U	52 U
Bromoform	µg/kg	0.049 U	0.050 U	0.050 U	0.057 U	-	130 U	43 U	52 U
Bromomethane (Methyl bromide)	µg/kg	0.049 U	0.050 U	0.050 U	0.057 U	-	130 U	43 U	52 U
Carbon disulfide	µg/kg	0.049 U	0.050 U	0.050 U	0.057 U	-	130 U	43 U	52 U
Carbon tetrachloride	µg/kg	0.049 U	0.050 U	0.050 U	0.057 U	-	130 U	43 U	52 U
Chlorobenzene	µg/kg	0.049 U	0.050 U	0.050 U	0.057 U	-	130 U	43 U	52 U
Chloroethane	µg/kg	0.049 U	0.050 U	0.050 U	0.057 U	-	130 U	43 U	52 U
Chloroform (Trichloromethane)	µg/kg	0.049 U	0.050 U	0.050 U	0.057 U	-	130 U	43 U	52 U
Chloromethane (Methyl chloride)	µg/kg	0.049 U	0.050 U	0.050 U	0.057 U	-	130 U	43 U	52 U
cis-1,2-Dichloroethene	µg/kg	0.049 U	0.050 U	0.050 U	0.057 U	-	980	320	140
cis-1,3-Dichloropropene	µg/kg	0.049 U	0.050 U	0.050 U	0.057 U	-	130 U	43 U	52 U
Cyclohexane	µg/kg	0.049 U	0.050 U	0.050 U	0.057 U	-	130 U	43 U	52 U
Dibromochloromethane	µg/kg	0.049 U	0.050 U	0.050 U	0.057 U	-	130 U	43 U	52 U
Dichlorodifluoromethane (CFC-12)	µg/kg	0.049 U	0.050 U	0.050 U	0.057 U	-	130 U	43 U	52 U
Ethylbenzene	µg/kg	0.049 U	0.050 U	0.050 U	0.057 U	-	130 U	43 U	52 U
Isopropyl benzene	µg/kg	0.049 U	0.050 U	0.050 U	0.057 U	-	130 U	43 U	52 U
Methyl acetate	µg/kg	0.25 U	0.25 U	0.25 U	0.28 U	-	630 U	220 U	260 U
Methyl cyclohexane	µg/kg	0.049 U	0.050 U	0.050 U	0.057 U	-	130 U	43 U	52 U
Methyl tert butyl ether (MTBE)	µg/kg	0.049 U	0.050 U	0.050 U	0.057 U	-	130 U	43 U	52 U
Methylene chloride	µg/kg	0.049 U	0.050 U	0.050 U	0.057 U	-	130 U	43 U	52 U
Styrene	µg/kg	0.049 U	0.050 U	0.050 U	0.057 U	-	130 U	43 U	52 U
Tetrachloroethene	µg/kg	0.049 U	0.050 U	0.050 U	0.057 U	-	130 U	43 U	52 U
Toluene	µg/kg	0.049 U	0.050 U	0.050 U	0.057 U	-	130 U	43 U	52 U
trans-1,2-Dichloroethene	µg/kg	0.049 U	0.050 U	0.050 U	0.057 U	-	110 J	28 J	52 U
trans-1,3-Dichloropropene	µg/kg	0.049 U	0.050 U	0.050 U	0.057 U	-	130 U	43 U	52 U
Trichloroethene	µg/kg	0.18	0.20	0.35	0.39	-	3600	1600	1500
Trichlorofluoromethane (CFC-11)	µg/kg	0.049 U	0.050 U	0.050 U	0.057 U	-	130 U	43 U	52 U
Trifluorotrichloroethane (CFC-113)	µg/kg	0.049 U	0.050 U	0.050 U	0.057 U	-	130 U	43 U	52 U
Vinyl chloride	µg/kg	0.049 U	0.050 U	0.050 U	0.057 U	-	130 U	43 U	52 U
Xylenes (total)	µg/kg	0.099 U	0.10 U	0.099 U	0.11 U	-	250 U	87 U	100 U
General Chemistry									
Fraction organic carbon (FOC)	%	-	-	-	-	0.7	-	-	-

Notes:

- J - Estimated concentration
- U - Not detected at the associated reporting limit
- UJ - Not detected; associated reporting limit is estimated
- R - Rejected
- ft bgs - Feet Below Ground Surface
- " - " Not applicable
- 2700000

Exceeds Part 375 RUSCO-C criteria
- Exceeds 1,000 ug/kg cleanup goal
- 470
- Exceeds Part 375 PoGW criteria

Table 1

Analytical Results Summary - Soil
Pre-Design Investigation
1130 Niagara Street Site (C915284)
Buffalo, New York

Location ID: Sample Name: Sample Date: Depth:		GP-33-1 S-11219347-111120-AMC-055 11/11/2020 11-13 ft. bgs	GP-33-1 S-11219347-111120-AMC-056 11/11/2020 13-15 ft. bgs	GP-33-1 S-11219347-111120-AMC-057 11/11/2020 15-16.3 ft. bgs	GP-35-1 S-11219347-111120-AMC-058 11/11/2020 4.5-6 ft. bgs	GP-35-1 S-11219347-111120-AMC-059 11/11/2020 6-8 ft. bgs	GP-35-1 S-11219347-111120-AMC-060 11/11/2020 6-8 ft. bgs Duplicate	GP-35-1 S-11219347-111120-AMC-061 11/11/2020 8-10 ft. bgs	GP-35-1 S-11219347-111120-AMC-062 11/11/2020 10-12 ft. bgs
Parameters	Unit								
Volatile Organic Compounds									
1,1,1-Trichloroethane	µg/kg	54	37 J	43 J	56 U	33 J	44 J	41 J	47 U
1,1,2,2-Tetrachloroethane	µg/kg	46 U	49 U	47 U	56 U	47 U	58 U	54 U	47 U
1,1,2-Trichloroethane	µg/kg	46 U	49 U	47 U	56 U	47 U	58 U	54 U	47 U
1,1-Dichloroethane	µg/kg	35 J	26 J	25 J	35 J	32 J	31 J	54 U	47 U
1,1-Dichloroethene	µg/kg	69	72	47 U	56 U	47 U	58 U	54 U	47 U
1,2,4-Trichlorobenzene	µg/kg	46 U	49 U	47 U	56 U	47 U	58 U	54 U	47 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	46 U	49 U	47 U	56 U	47 U	58 U	54 U	47 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	46 U	49 U	47 U	56 U	47 U	58 U	54 U	47 U
1,2-Dichlorobenzene	µg/kg	46 U	49 U	47 U	56 U	47 U	58 U	54 U	47 U
1,2-Dichloroethane	µg/kg	46 U	49 U	47 U	56 U	47 U	58 U	54 U	47 U
1,2-Dichloropropane	µg/kg	46 U	49 U	47 U	56 U	47 U	58 U	54 U	47 U
1,3-Dichlorobenzene	µg/kg	46 U	49 U	47 U	56 U	47 U	58 U	54 U	47 U
1,4-Dichlorobenzene	µg/kg	46 U	49 U	47 U	56 U	47 U	58 U	54 U	47 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	230 U	250 U	240 U	280 U	230 U	290 U	270 U	230 U
2-Hexanone	µg/kg	230 U	250 U	240 U	280 U	230 U	290 U	270 U	230 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	230 U	250 U	240 U	280 U	230 U	290 U	270 U	230 U
Acetone	µg/kg	230 U	250 U	240 U	280 U	230 U	290 U	270 U	230 U
Benzene	µg/kg	46 U	49 U	47 U	56 U	47 U	58 U	54 U	47 U
Bromodichloromethane	µg/kg	46 U	49 U	47 U	56 U	47 U	58 U	54 U	47 U
Bromoform	µg/kg	46 U	49 U	47 U	56 U	47 U	58 U	54 U	47 U
Bromomethane (Methyl bromide)	µg/kg	46 U	49 U	47 U	56 U	47 U	58 U	54 U	47 U
Carbon disulfide	µg/kg	46 U	49 U	47 U	56 U	47 U	58 U	54 U	47 U
Carbon tetrachloride	µg/kg	46 U	49 U	47 U	56 U	47 U	58 U	54 U	47 U
Chlorobenzene	µg/kg	46 U	49 U	47 U	56 U	47 U	58 U	54 U	47 U
Chloroethane	µg/kg	46 U	49 U	47 U	56 U	47 U	58 U	54 U	47 U
Chloroform (Trichloromethane)	µg/kg	46 U	49 U	47 U	56 U	47 U	58 U	54 U	47 U
Chloromethane (Methyl chloride)	µg/kg	46 U	49 U	47 U	56 U	47 U	58 U	54 U	47 U
cis-1,2-Dichloroethene	µg/kg	120	76	67	250	180	230	20 J	47 U
cis-1,3-Dichloropropene	µg/kg	46 U	49 U	47 U	56 U	47 U	58 U	54 U	47 U
Cyclohexane	µg/kg	46 U	49 U	47 U	56 U	47 U	58 U	54 U	47 U
Dibromochloromethane	µg/kg	46 U	49 U	47 U	56 U	47 U	58 U	54 U	47 U
Dichlorodifluoromethane (CFC-12)	µg/kg	46 U	49 U	47 U	56 U	47 U	58 U	54 U	47 U
Ethylbenzene	µg/kg	46 U	49 U	47 U	56 U	47 U	58 U	54 U	47 U
Isopropyl benzene	µg/kg	46 U	49 U	47 U	56 U	47 U	58 U	54 U	47 U
Methyl acetate	µg/kg	230 U	250 U	240 U	280 U	230 U	290 U	270 U	230 U
Methyl cyclohexane	µg/kg	46 U	49 U	47 U	56 U	47 U	58 U	54 U	47 U
Methyl tert butyl ether (MTBE)	µg/kg	46 U	49 U	47 U	56 U	47 U	58 U	54 U	47 U
Methylene chloride	µg/kg	46 U	49 U	47 U	56 U	47 U	58 U	54 U	47 U
Styrene	µg/kg	46 U	49 U	47 U	56 U	47 U	58 U	54 U	47 U
Tetrachloroethene	µg/kg	46 U	49 U	47 U	56 U	47 U	58 U	54 U	47 U
Toluene	µg/kg	46 U	49 U	47 U	56 U	47 U	58 U	54 U	47 U
trans-1,2-Dichloroethene	µg/kg	46 U	49 U	47 U	56 U	47 U	58 U	54 U	47 U
trans-1,3-Dichloropropene	µg/kg	46 U	49 U	47 U	56 U	47 U	58 U	54 U	47 U
Trichloroethene	µg/kg	1400	830	820	910	850	900	740	400
Trichlorofluoromethane (CFC-11)	µg/kg	46 U	49 U	47 U	56 U	47 U	58 U	54 U	47 U
Trifluorotrichloroethane (CFC-113)	µg/kg	46 U	49 U	47 U	56 U	47 U	58 U	54 U	47 U
Vinyl chloride	µg/kg	46 U	49 U	47 U	56 U	47 U	58 U	54 U	47 U
Xylenes (total)	µg/kg	92 U	99 U	94 U	110 U	93 U	120 U	110 U	94 U
General Chemistry									
Fraction organic carbon (FOC)	%	-	-	-	-	-	-	-	-

Notes:

- J - Estimated concentration
- U - Not detected at the associated reporting limit
- UJ - Not detected; associated reporting limit is estimated
- R - Rejected
- ft bgs - Feet Below Ground Surface
- " - " Not applicable
- 2700000Exceeds Part 375 RUSCO-C criteria
- Exceeds 1,000 ug/kg cleanup goal
- 470Exceeds Part 375 PoGW criteria

Table 1

Analytical Results Summary - Soil
Pre-Design Investigation
1130 Niagara Street Site (C915284)
Buffalo, New York

Location ID:		GP-35-1		GP-35-1		GP-36		GP-36		GP-36		GP-36		GP-36		GP-37	
Sample Name:		S-11219347-111120-AMC-063		S-11219347-111120-AMC-064		S-11219347-111720-AMC-162		S-11219347-111720-AMC-163		S-11219347-111720-AMC-164		S-11219347-111720-AMC-165		S-11219347-111720-AMC-166		S-11219347-111720-AMC-156	
Sample Date:		11/11/2020		11/11/2020		11/17/2020		11/17/2020		11/17/2020		11/17/2020		11/17/2020		11/17/2020	
Depth:		12-14 ft. bgs		14-15.9 ft. bgs		6-8 ft. bgs		8-10 ft. bgs		10-12 ft. bgs		12-14 ft. bgs		14-15.7 ft. bgs		4-5 ft. bgs	
Parameters		Unit															
Volatile Organic Compounds																	
1,1,1-Trichloroethane	µg/kg	48 U		49 U		7.0		5.5		5.8		7.7		3.8 J		-	
1,1,2,2-Tetrachloroethane	µg/kg	48 U		49 U		4.7 U		4.2 U		3.6 U		3.8 U		4.3 U		-	
1,1,2-Trichloroethane	µg/kg	48 U		49 U		4.7 U		4.2 U		3.6 U		3.8 U		4.3 U		-	
1,1-Dichloroethane	µg/kg	48 U		49 U		2.0 J		1.9 J		1.9 J		1.4 J		0.75 J		-	
1,1-Dichloroethene	µg/kg	48 U		49 U		0.85 J		0.76 J		0.84 J		2.3 J		1.7 J		-	
1,2,4-Trichlorobenzene	µg/kg	48 U		49 U		4.7 U		4.2 U		3.6 U		3.8 U		4.3 U		-	
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	48 U		49 U		4.7 U		4.2 U		3.6 U		3.8 U		4.3 U		-	
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	48 U		49 U		4.7 U		4.2 U		3.6 U		3.8 U		4.3 U		-	
1,2-Dichlorobenzene	µg/kg	48 U		49 U		4.7 U		4.2 U		3.6 U		3.8 U		4.3 U		-	
1,2-Dichloroethane	µg/kg	48 U		49 U		4.7 U		4.2 U		3.6 U		3.8 U		4.3 U		-	
1,2-Dichloropropane	µg/kg	48 U		49 U		4.7 U		4.2 U		3.6 U		3.8 U		4.3 U		-	
1,3-Dichlorobenzene	µg/kg	48 U		49 U		4.7 U		4.2 U		3.6 U		3.8 U		4.3 U		-	
1,4-Dichlorobenzene	µg/kg	48 U		49 U		4.7 U		4.2 U		3.6 U		3.8 U		4.3 U		-	
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	240 U		250 U		23 U		21 U		18 U		19 U		22 U		-	
2-Hexanone	µg/kg	240 U		250 U		23 U		21 U		18 U		19 U		22 U		-	
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	240 U		250 U		23 U		21 U		18 U		19 U		22 U		-	
Acetone	µg/kg	240 U		250 U		23 U		21 U		18 U		19 U		22 U		-	
Benzene	µg/kg	48 U		49 U		4.7 U		4.2 U		3.6 U		3.8 U		4.3 U		-	
Bromodichloromethane	µg/kg	48 U		49 U		4.7 U		4.2 U		3.6 U		3.8 U		4.3 U		-	
Bromoform	µg/kg	48 U		49 U		4.7 U		4.2 U		3.6 U		3.8 U		4.3 U		-	
Bromomethane (Methyl bromide)	µg/kg	48 U		49 U		4.7 U		4.2 U		3.6 U		3.8 U		4.3 U		-	
Carbon disulfide	µg/kg	48 U		49 U		4.7 U		4.2 U		3.6 U		3.8 U		4.3 U		-	
Carbon tetrachloride	µg/kg	48 U		49 U		4.7 U		4.2 U		3.6 U		3.8 U		4.3 U		-	
Chlorobenzene	µg/kg	48 U		49 U		4.7 U		4.2 U		3.6 U		3.8 U		4.3 U		-	
Chloroethane	µg/kg	48 U		49 U		4.7 U		4.2 U		3.6 U		3.8 U		4.3 U		-	
Chloroform (Trichloromethane)	µg/kg	48 U		49 U		4.7 U		4.2 U		3.6 U		3.8 U		4.3 U		-	
Chloromethane (Methyl chloride)	µg/kg	48 U		49 U		4.7 U		4.2 U		3.6 U		3.8 U		4.3 U		-	
cis-1,2-Dichloroethene	µg/kg	48 U		49 U		3.2 J		3.4 J		2.8 J		1.6 J		0.68 J		-	
cis-1,3-Dichloropropene	µg/kg	48 U		49 U		4.7 U		4.2 U		3.6 U		3.8 U		4.3 U		-	
Cyclohexane	µg/kg	48 U		49 U		4.7 U		4.2 U		3.6 U		3.8 U		4.3 U		-	
Dibromochloromethane	µg/kg	48 U		49 U		4.7 U		4.2 U		3.6 U		3.8 U		4.3 U		-	
Dichlorodifluoromethane (CFC-12)	µg/kg	48 U		49 U		4.7 U		4.2 U		3.6 U		3.8 U		4.3 U		-	
Ethylbenzene	µg/kg	48 U		49 U		4.7 U		4.2 U		3.6 U		3.8 U		4.3 U		-	
Isopropyl benzene	µg/kg	48 U		49 U		4.7 U		4.2 U		3.6 U		3.8 U		4.3 U		-	
Methyl acetate	µg/kg	240 U		250 U		23 U		21 U		18 U		19 U		22 U		-	
Methyl cyclohexane	µg/kg	48 U		49 U		4.7 U		4.2 U		3.6 U		3.8 U		4.3 U		-	
Methyl tert butyl ether (MTBE)	µg/kg	48 U		49 U		4.7 U		4.2 U		3.6 U		3.8 U		4.3 U		-	
Methylene chloride	µg/kg	48 U		49 U		4.7 U		4.2 U		3.6 U		3.8 U		4.3 U		-	
Styrene	µg/kg	48 U		49 U		4.7 U		4.2 U		3.6 U		3.8 U		4.3 U		-	
Tetrachloroethene	µg/kg	48 U		49 U		4.7 U		4.2 U		3.6 U		3.8 U		4.3 U		-	
Toluene	µg/kg	48 U		49 U		4.7 U		4.2 U		3.6 U		3.8 U		4.3 U		-	
trans-1,2-Dichloroethene	µg/kg	48 U		49 U		4.7 U		4.2 U		3.6 U		3.8 U		4.3 U		-	
trans-1,3-Dichloropropene	µg/kg	48 U		49 U		4.7 U		4.2 U		3.6 U		3.8 U		4.3 U		-	
Trichloroethene	µg/kg	160		130		17		22		22		43		38		-	
Trichlorofluoromethane (CFC-11)	µg/kg	48 U		49 U		4.7 U		4.2 U		3.6 U		3.8 U		4.3 U		-	
Trifluorotrichloroethane (CFC-113)	µg/kg	48 U		49 U		4.7 U		4.2 U		3.6 U		3.8 U		4.3 U		-	
Vinyl chloride	µg/kg	48 U		49 U		4.7 U		4.2 U		3.6 U		3.8 U		4.3 U		-	
Xylenes (total)	µg/kg	96 U		98 U		9.4 U		8.4 U		7.2 U		7.5 U		8.7 U		-	
General Chemistry																	
Fraction organic carbon (FOC)	%	-		-		-		-		-		-		-		4.0	

Notes:

- J - Estimated concentration
- U - Not detected at the associated reporting limit
- UJ - Not detected; associated reporting limit is estimated
- R - Rejected
- ft bgs - Feet Below Ground Surface
- " - " Not applicable
- 2700000

Exceeds Part 375 RUSCO-C criteria
- Exceeds 1,000 ug/kg cleanup goal
- 470

Exceeds Part 375 PoGW criteria

Table 1

Analytical Results Summary - Soil
Pre-Design Investigation
1130 Niagara Street Site (C915284)
Buffalo, New York

Location ID: Sample Name: Sample Date: Depth:		GP-37 S-11219347-111720-AMC-157 11/17/2020 6-8 ft. bgs	GP-37 S-11219347-111720-AMC-158 11/17/2020 8-10 ft. bgs	GP-37 S-11219347-111720-AMC-159 11/17/2020 10-12 ft. bgs	GP-37 S-11219347-111720-AMC-160 11/17/2020 12-14 ft. bgs	GP-37 S-11219347-111720-AMC-161 11/17/2020 14-15.1 ft. bgs	GP-38 S-11219347-111320-AMC-102 11/13/2020 8.5-10 ft. bgs	GP-38 S-11219347-111320-AMC-103 11/13/2020 10-12 ft. bgs	GP-38 S-11219347-111320-AMC-104 11/13/2020 10-12 ft. bgs Duplicate
Parameters	Unit								
Volatile Organic Compounds									
1,1,1-Trichloroethane	µg/kg	59 U	51 U	59 U	3.8	2.4 J	57 U	57 U	55 U
1,1,2,2-Tetrachloroethane	µg/kg	59 U	51 U	59 U	3.7 U	3.7 U	57 U	57 U	55 U
1,1,2-Trichloroethane	µg/kg	59 U	51 U	59 U	3.7 U	3.7 U	57 U	57 U	55 U
1,1-Dichloroethane	µg/kg	30 J	51 U	59 U	2.5 J	2.0 J	57 U	57 U	55 U
1,1-Dichloroethene	µg/kg	59 U	51 U	59 U	1.4 J	1.3 J	57 U	57 U	55 U
1,2,4-Trichlorobenzene	µg/kg	59 U	51 U	59 U	3.7 U	3.7 U	57 U	57 U	55 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	59 U	51 U	59 U	3.7 U	3.7 U	57 U	57 U	55 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	59 U	51 U	59 U	3.7 U	3.7 U	57 U	57 U	55 U
1,2-Dichlorobenzene	µg/kg	59 U	51 U	59 U	3.7 U	3.7 U	57 U	57 U	55 U
1,2-Dichloroethane	µg/kg	59 U	51 U	59 U	3.7 U	3.7 U	57 U	57 U	55 U
1,2-Dichloropropane	µg/kg	59 U	51 U	59 U	3.7 U	3.7 U	57 U	57 U	55 U
1,3-Dichlorobenzene	µg/kg	59 U	51 U	59 U	3.7 U	3.7 U	57 U	57 U	55 U
1,4-Dichlorobenzene	µg/kg	59 U	51 U	59 U	3.7 U	3.7 U	57 U	57 U	55 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	290 U	260 U	300 U	18 U	19 U	280 U	290 U	280 U
2-Hexanone	µg/kg	290 U	260 U	300 U	18 U	19 U	280 U	290 U	280 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	290 U	260 U	300 U	18 U	19 U	280 U	290 U	280 U
Acetone	µg/kg	290 U	260 U	300 U	18 U	19 U	280 U	290 U	280 U
Benzene	µg/kg	59 U	51 U	59 U	3.7 U	3.7 U	57 U	57 U	55 U
Bromodichloromethane	µg/kg	59 U	51 U	59 U	3.7 U	3.7 U	57 U	57 U	55 U
Bromoform	µg/kg	59 U	51 U	59 U	3.7 U	3.7 U	57 U	57 U	55 U
Bromomethane (Methyl bromide)	µg/kg	59 U	51 U	59 U	3.7 U	3.7 U	57 U	57 U	55 U
Carbon disulfide	µg/kg	59 U	51 U	59 U	3.7 U	3.7 U	57 U	57 U	55 U
Carbon tetrachloride	µg/kg	59 U	51 U	59 U	3.7 U	3.7 U	57 U	57 U	55 U
Chlorobenzene	µg/kg	59 U	51 U	59 U	3.7 U	3.7 U	57 U	57 U	55 U
Chloroethane	µg/kg	59 U	51 U	59 U	3.7 U	3.7 U	57 U	57 U	55 U
Chloroform (Trichloromethane)	µg/kg	59 U	51 U	59 U	3.7 U	3.7 U	57 U	57 U	55 U
Chloromethane (Methyl chloride)	µg/kg	59 U	51 U	59 U	3.7 U	3.7 U	57 U	57 U	55 U
cis-1,2-Dichloroethene	µg/kg	63	23 J	23 J	2.4 J	1.2 J	57 U	57 U	55 U
cis-1,3-Dichloropropene	µg/kg	59 U	51 U	59 U	3.7 U	3.7 U	57 U	57 U	55 U
Cyclohexane	µg/kg	59 U	51 U	59 U	3.7 U	3.7 U	57 U	57 U	55 U
Dibromochloromethane	µg/kg	59 U	51 U	59 U	3.7 U	3.7 U	57 U	57 U	55 U
Dichlorodifluoromethane (CFC-12)	µg/kg	59 U	51 U	59 U	3.7 U	3.7 U	57 U	57 U	55 U
Ethylbenzene	µg/kg	59 U	51 U	59 U	3.7 U	3.7 U	57 U	57 U	55 U
Isopropyl benzene	µg/kg	59 U	51 U	59 U	3.7 U	3.7 U	57 U	57 U	55 U
Methyl acetate	µg/kg	290 U	260 U	300 U	18 U	19 U	280 U	290 U	280 U
Methyl cyclohexane	µg/kg	59 U	51 U	59 U	3.7 U	3.7 U	57 U	57 U	55 U
Methyl tert butyl ether (MTBE)	µg/kg	59 U	51 U	59 U	3.7 U	3.7 U	57 U	57 U	55 U
Methylene chloride	µg/kg	59 U	51 U	59 U	3.7 U	3.7 U	57 U	57 U	55 U
Styrene	µg/kg	59 U	51 U	59 U	3.7 U	3.7 U	57 U	57 U	55 U
Tetrachloroethene	µg/kg	59 U	51 U	59 U	3.7 U	3.7 U	57 U	57 U	55 U
Toluene	µg/kg	59 U	51 U	59 U	3.7 U	3.7 U	57 U	57 U	55 U
trans-1,2-Dichloroethene	µg/kg	59 U	51 U	59 U	3.7 U	3.7 U	57 U	57 U	55 U
trans-1,3-Dichloropropene	µg/kg	59 U	51 U	59 U	3.7 U	3.7 U	57 U	57 U	55 U
Trichloroethene	µg/kg	1400	230	270	17	18	620	590	660
Trichlorofluoromethane (CFC-11)	µg/kg	59 U	51 U	59 U	3.7 U	3.7 U	57 U	57 U	55 U
Trifluorotrichloroethane (CFC-113)	µg/kg	59 U	51 U	59 U	3.7 U	3.7 U	57 U	57 U	55 U
Vinyl chloride	µg/kg	59 U	51 U	59 U	3.7 U	3.7 U	57 U	57 U	55 U
Xylenes (total)	µg/kg	120 U	100 U	120 U	7.4 U	7.5 U	110 U	110 U	110 U
General Chemistry									
Fraction organic carbon (FOC)	%	-	-	-	-	-	-	-	-

Notes:

- J - Estimated concentration
- U - Not detected at the associated reporting limit
- UJ - Not detected; associated reporting limit is estimated
- R - Rejected
- ft bgs - Feet Below Ground Surface
- " - " Not applicable
- 2700000

Exceeds Part 375 RUSCO-C criteria
- Exceeds 1,000 ug/kg cleanup goal
- 470
- Exceeds Part 375 PoGW criteria

Table 1

Analytical Results Summary - Soil
Pre-Design Investigation
1130 Niagara Street Site (C915284)
Buffalo, New York

Location ID:		GP-38		GP-38		GP-39		GP-39		GP-39		GP-40		GP-40			
Sample Name:		S-11219347-111320-AMC-105		S-11219347-111320-AMC-106		S-11219347-111320-AMC-107		S-11219347-111320-AMC-108		S-11219347-111320-AMC-109		S-11219347-111320-AMC-110		S-11219347-111020-AMC-034		S-11219347-111020-AMC-035	
Sample Date:		11/13/2020		11/13/2020		11/13/2020		11/13/2020		11/13/2020		11/13/2020		11/10/2020		11/10/2020	
Depth:		12-14 ft. bgs		14-16.2 ft. bgs		9-11 ft. bgs		11-13 ft. bgs		13-15 ft. bgs		15-15.9 ft. bgs		5-7 ft. bgs		7-9 ft. bgs	
Parameters		Unit															
Volatile Organic Compounds																	
1,1,1-Trichloroethane	µg/kg	53 J	63 U	7.9	52 U	8.5	29 J	0.050 U	0.045 U								
1,1,2,2-Tetrachloroethane	µg/kg	59 U	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U	0.045 U								
1,1,2-Trichloroethane	µg/kg	59 U	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U	0.045 U								
1,1-Dichloroethane	µg/kg	59 U	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U	0.045 U								
1,1-Dichloroethene	µg/kg	59 U	63 U	0.67 J	52 U	1.4 J	48 U	0.050 U	0.045 U								
1,2,4-Trichlorobenzene	µg/kg	59 U	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U	0.045 U								
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	59 U	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U	0.045 U								
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	59 U	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U	0.045 U								
1,2-Dichlorobenzene	µg/kg	59 U	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U	0.045 U								
1,2-Dichloroethane	µg/kg	59 U	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U	0.045 U								
1,2-Dichloropropane	µg/kg	59 U	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U	0.045 U								
1,3-Dichlorobenzene	µg/kg	59 U	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U	0.045 U								
1,4-Dichlorobenzene	µg/kg	59 U	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U	0.045 U								
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	290 U	320 U	23 U	260 U	18 U	240 U	0.25 U	0.23 U								
2-Hexanone	µg/kg	290 U	320 U	23 U	260 U	18 U	240 U	0.25 U	0.23 U								
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	290 U	320 U	23 U	260 U	18 U	240 U	0.25 U	0.23 U								
Acetone	µg/kg	290 U	320 U	23 U	260 U	18 U	240 U	0.25 U	0.23 U								
Benzene	µg/kg	59 U	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U	0.045 U								
Bromodichloromethane	µg/kg	59 U	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U	0.045 U								
Bromoform	µg/kg	59 U	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U	0.045 U								
Bromomethane (Methyl bromide)	µg/kg	59 U	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U	0.045 U								
Carbon disulfide	µg/kg	59 U	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U	0.045 U								
Carbon tetrachloride	µg/kg	59 U	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U	0.045 U								
Chlorobenzene	µg/kg	59 U	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U	0.045 U								
Chloroethane	µg/kg	59 U	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U	0.045 U								
Chloroform (Trichloromethane)	µg/kg	59 U	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U	0.045 U								
Chloromethane (Methyl chloride)	µg/kg	59 U	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U	0.045 U								
cis-1,2-Dichloroethene	µg/kg	59 U	410	4.6 U	52 U	0.74 J	48 U	0.078	0.045 U								
cis-1,3-Dichloropropene	µg/kg	59 U	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U	0.045 U								
Cyclohexane	µg/kg	59 U	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U	0.045 U								
Dibromochloromethane	µg/kg	59 U	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U	0.045 U								
Dichlorodifluoromethane (CFC-12)	µg/kg	59 U	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U	0.045 U								
Ethylbenzene	µg/kg	59 U	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U	0.045 U								
Isopropyl benzene	µg/kg	59 U	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U	0.045 U								
Methyl acetate	µg/kg	290 U	320 U	23 U	260 U	18 U	240 U	0.25 U	0.23 U								
Methyl cyclohexane	µg/kg	59 U	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U	0.045 U								
Methyl tert butyl ether (MTBE)	µg/kg	59 U	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U	0.045 U								
Methylene chloride	µg/kg	59 U	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U	0.045 U								
Styrene	µg/kg	59 U	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U	0.045 U								
Tetrachloroethene	µg/kg	59 U	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U	0.045 U								
Toluene	µg/kg	59 U	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U	0.045 U								
trans-1,2-Dichloroethene	µg/kg	59 U	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U	0.045 U								
trans-1,3-Dichloropropene	µg/kg	59 U	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U	0.045 U								
Trichloroethene	µg/kg	650	490	33	170	45	170	0.51	0.28								
Trichlorofluoromethane (CFC-11)	µg/kg	59 U	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U	0.045 U								
Trifluorotrichloroethane (CFC-113)	µg/kg	59 U	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U	0.045 U								
Vinyl chloride	µg/kg	59 U	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U	0.045 U								
Xylenes (total)	µg/kg	120 U	130 U	9.1 U	100 U	7.2 U	95 U	0.10 U	0.091 U								
General Chemistry																	
Fraction organic carbon (FOC)	%	-	-	-	-	-	-	-	-								

Notes:

- J - Estimated concentration
- U - Not detected at the associated reporting limit
- UJ - Not detected; associated reporting limit is estimated
- R - Rejected
- ft bgs - Feet Below Ground Surface
- " - " Not applicable
- 2700000 Exceeds Part 375 RUSCO-C criteria
- Exceeds 1,000 ug/kg cleanup goal
- 470 Exceeds Part 375 PoGW criteria

Table 1

Analytical Results Summary - Soil
Pre-Design Investigation
1130 Niagara Street Site (C915284)
Buffalo, New York

Location ID:		GP-40	GP-40	GP-40	GP-42	GP-42	GP-42	GP-42	GP-44
Sample Name:		S-11219347-111020-AMC-036	S-11219347-111020-AMC-038	S-11219347-111020-AMC-042	S-11219347-111320-AMC-111	S-11219347-111320-AMC-112	S-11219347-111320-AMC-113	S-11219347-111320-AMC-114	S-11219347-111320-AMC-116
Sample Date:		11/10/2020	11/10/2020	11/10/2020	11/13/2020	11/13/2020	11/13/2020	11/13/2020	11/13/2020
Depth:		9-11 ft. bgs	11-13 ft. bgs	13-15.5 ft. bgs	9-11 ft. bgs	11-13 ft. bgs	13-15 ft. bgs	15-16.4 ft. bgs	12-14 ft. bgs
Parameters	Unit								
Volatile Organic Compounds									
1,1,1-Trichloroethane	µg/kg	0.13 U	0.20 U	0.051 U	10	52 U	15	8.2	170
1,1,2,2-Tetrachloroethane	µg/kg	0.13 U	0.20 U	0.051 U	4.2 U	52 U	4.0 U	3.9 U	63 U
1,1,2-Trichloroethane	µg/kg	0.13 U	0.20 U	0.051 U	4.2 U	52 U	4.0 U	3.9 U	63 U
1,1-Dichloroethane	µg/kg	0.13 U	0.20 U	0.051 U	4.2 U	52 U	4.0 U	3.9 U	63 U
1,1-Dichloroethene	µg/kg	0.13 U	0.20 U	0.051 U	1.2 J	52 U	1.4 J	0.81 J	63 U
1,2,4-Trichlorobenzene	µg/kg	0.13 U	0.20 U	0.051 U	4.2 U	52 U	4.0 U	3.9 U	63 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	0.13 U	0.20 U	0.051 U	4.2 U	52 U	4.0 U	3.9 U	63 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	0.13 U	0.20 U	0.051 U	4.2 U	52 U	4.0 U	3.9 U	63 U
1,2-Dichlorobenzene	µg/kg	0.13 U	0.20 U	0.051 U	4.2 U	52 U	4.0 U	3.9 U	63 U
1,2-Dichloroethane	µg/kg	0.13 U	0.20 U	0.051 U	4.2 U	52 U	4.0 U	3.9 U	63 U
1,2-Dichloropropane	µg/kg	0.13 U	0.20 U	0.051 U	4.2 U	52 U	4.0 U	3.9 U	63 U
1,3-Dichlorobenzene	µg/kg	0.13 U	0.20 U	0.051 U	4.2 U	52 U	4.0 U	3.9 U	63 U
1,4-Dichlorobenzene	µg/kg	0.13 U	0.20 U	0.051 U	4.2 U	52 U	4.0 U	3.9 U	63 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	0.63 U	0.99 U	0.25 U	21 U	260 U	20 U	19 U	320 U
2-Hexanone	µg/kg	0.63 U	0.99 U	0.25 U	21 U	260 U	20 U	19 U	320 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	0.63 U	0.99 U	0.25 U	21 U	260 U	20 U	19 U	320 U
Acetone	µg/kg	0.63 U	0.99 U	0.25 U	21 U	260 U	20 U	19 U	320 U
Benzene	µg/kg	0.13 U	0.20 U	0.051 U	4.2 U	52 U	4.0 U	3.9 U	63 U
Bromodichloromethane	µg/kg	0.13 U	0.20 U	0.051 U	4.2 U	52 U	4.0 U	3.9 U	63 U
Bromoform	µg/kg	0.13 U	0.20 U	0.051 U	4.2 U	52 U	4.0 U	3.9 U	63 U
Bromomethane (Methyl bromide)	µg/kg	0.13 U	0.20 U	0.051 U	4.2 U	52 U	4.0 U	3.9 U	63 U
Carbon disulfide	µg/kg	0.13 U	0.20 U	0.051 U	4.2 U	52 U	4.0 U	3.9 U	63 U
Carbon tetrachloride	µg/kg	0.13 U	0.20 U	0.051 U	4.2 U	52 U	4.0 U	3.9 U	63 U
Chlorobenzene	µg/kg	0.13 U	0.20 U	0.051 U	4.2 U	52 U	4.0 U	3.9 U	63 U
Chloroethane	µg/kg	0.13 U	0.20 U	0.051 U	4.2 U	52 U	4.0 U	3.9 U	63 U
Chloroform (Trichloromethane)	µg/kg	0.13 U	0.20 U	0.051 U	4.2 U	52 U	4.0 U	3.9 U	63 U
Chloromethane (Methyl chloride)	µg/kg	0.13 U	0.20 U	0.051 U	4.2 U	52 U	4.0 U	3.9 U	63 U
cis-1,2-Dichloroethene	µg/kg	0.13 U	0.20 U	0.051 U	4.2 U	52 U	4.0 U	3.9 U	63 U
cis-1,3-Dichloropropene	µg/kg	0.13 U	0.20 U	0.051 U	4.2 U	52 U	4.0 U	3.9 U	63 U
Cyclohexane	µg/kg	0.13 U	0.20 U	0.051 U	4.2 U	52 U	4.0 U	3.9 U	63 U
Dibromochloromethane	µg/kg	0.13 U	0.20 U	0.051 U	4.2 U	52 U	4.0 U	3.9 U	63 U
Dichlorodifluoromethane (CFC-12)	µg/kg	0.13 U	0.20 U	0.051 U	4.2 U	52 U	4.0 U	3.9 U	63 U
Ethylbenzene	µg/kg	0.13 U	0.20 U	0.051 U	4.2 U	52 U	4.0 U	3.9 U	63 U
Isopropyl benzene	µg/kg	0.13 U	0.20 U	0.051 U	4.2 U	52 U	4.0 U	3.9 U	63 U
Methyl acetate	µg/kg	0.63 U	0.99 U	0.25 U	21 U	260 U	20 U	19 U	320 U
Methyl cyclohexane	µg/kg	0.13 U	0.20 U	0.051 U	4.2 U	52 U	4.0 U	3.9 U	63 U
Methyl tert butyl ether (MTBE)	µg/kg	0.13 U	0.20 U	0.051 U	4.2 U	52 U	4.0 U	3.9 U	63 U
Methylene chloride	µg/kg	0.13 U	0.20 U	0.051 U	4.2 U	52 U	4.0 U	3.9 U	63 U
Styrene	µg/kg	0.13 U	0.20 U	0.051 U	4.2 U	52 U	4.0 U	3.9 U	63 U
Tetrachloroethene	µg/kg	0.13 U	0.20 U	0.051 U	4.2 U	52 U	4.0 U	3.9 U	63 U
Toluene	µg/kg	0.13 U	0.20 U	0.051 U	4.2 U	52 U	4.0 U	3.9 U	63 U
trans-1,2-Dichloroethene	µg/kg	0.13 U	0.20 U	0.051 U	4.2 U	52 U	4.0 U	3.9 U	63 U
trans-1,3-Dichloropropene	µg/kg	0.13 U	0.20 U	0.051 U	4.2 U	52 U	4.0 U	3.9 U	63 U
Trichloroethene	µg/kg	0.54	0.31	0.13	22	91	17	12	550
Trichlorofluoromethane (CFC-11)	µg/kg	0.13 U	0.20 U	0.051 U	4.2 U	52 U	4.0 U	3.9 U	63 U
Trifluorotrichloroethane (CFC-113)	µg/kg	0.13 U	0.20 U	0.051 U	4.2 U	52 U	4.0 U	3.9 U	63 U
Vinyl chloride	µg/kg	0.13 U	0.20 U	0.051 U	4.2 U	52 U	4.0 U	3.9 U	63 U
Xylenes (total)	µg/kg	0.25 U	0.40 U	0.10 U	8.4 U	100 U	7.9 U	7.7 U	130 U
General Chemistry									
Fraction organic carbon (FOC)	%	-	-	-	-	-	-	-	-

Notes:

- J - Estimated concentration
- U - Not detected at the associated reporting limit
- UJ - Not detected; associated reporting limit is estimated
- R - Rejected
- ft bgs - Feet Below Ground Surface
- " - " Not applicable
- 2700000

Exceeds Part 375 RUSCO-C criteria
- Exceeds 1,000 ug/kg cleanup goal
- 470
- Exceeds Part 375 PoGW criteria

Table 1

Analytical Results Summary - Soil
Pre-Design Investigation
1130 Niagara Street Site (C915284)
Buffalo, New York

Location ID:		GP-44	GP-44	GP-45	GP-45	GP-45	GP-45	GP-45	GP-47
Sample Name:		S-11219347-111320-AMC-117	S-11219347-111320-AMC-118	S-11219347-111020-AMC-029	S-11219347-111020-AMC-030	S-11219347-111020-AMC-031	S-11219347-111020-AMC-033	S-11219347-111020-AMC-032	S-11219347-111820-AMC-181
Sample Date:		11/13/2020	11/13/2020	11/10/2020	11/10/2020	11/10/2020	11/10/2020	11/10/2020	11/18/2020
Depth:		14-15.8 ft. bgs	15.6-15.8 ft. bgs	6-8 ft. bgs	9-11 ft. bgs	11-13 ft. bgs	11-13 ft. bgs	13-15.3 ft. bgs	2.8-4.6 ft. bgs
Parameters	Unit								
Volatile Organic Compounds									
1,1,1-Trichloroethane	µg/kg	240	-	32 J	27 J	42 J	-	5.8	510
1,1,2,2-Tetrachloroethane	µg/kg	64 U	-	60 U	49 U	51 U	-	3.8 U	48 U
1,1,2-Trichloroethane	µg/kg	64 U	-	60 U	49 U	51 U	-	3.8 U	48 U
1,1-Dichloroethane	µg/kg	64 U	-	60 U	49 U	51 U	-	2.1 J	48 U
1,1-Dichloroethene	µg/kg	64 U	-	60 U	49 U	51 U	-	13	33 J
1,2,4-Trichlorobenzene	µg/kg	64 U	-	60 U	49 U	51 U	-	3.8 U	48 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	64 U	-	60 U	49 U	51 U	-	3.8 U	48 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	64 U	-	60 U	49 U	51 U	-	3.8 U	48 U
1,2-Dichlorobenzene	µg/kg	64 U	-	60 U	49 U	51 U	-	3.8 U	48 U
1,2-Dichloroethane	µg/kg	64 U	-	60 U	49 U	51 U	-	3.8 U	48 U
1,2-Dichloropropane	µg/kg	64 U	-	60 U	49 U	51 U	-	3.8 U	48 U
1,3-Dichlorobenzene	µg/kg	64 U	-	60 U	49 U	51 U	-	3.8 U	48 U
1,4-Dichlorobenzene	µg/kg	64 U	-	60 U	49 U	51 U	-	3.8 U	48 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	320 U	-	300 U	240 U	260 U	-	19 U	240 U
2-Hexanone	µg/kg	320 U	-	300 U	240 U	260 U	-	19 U	240 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	320 U	-	300 U	240 U	260 U	-	19 U	240 U
Acetone	µg/kg	320 U	-	300 U	240 U	260 U	-	19 U	240 U
Benzene	µg/kg	64 U	-	60 U	49 U	51 U	-	0.19 J	48 U
Bromodichloromethane	µg/kg	64 U	-	60 U	49 U	51 U	-	3.8 U	48 U
Bromoform	µg/kg	64 U	-	60 U	49 U	51 U	-	3.8 U	48 U
Bromomethane (Methyl bromide)	µg/kg	64 U	-	60 U	49 U	51 U	-	3.8 U	48 U
Carbon disulfide	µg/kg	64 U	-	60 U	49 U	51 U	-	3.8 U	48 U
Carbon tetrachloride	µg/kg	64 U	-	60 U	49 U	51 U	-	3.8 U	48 U
Chlorobenzene	µg/kg	64 U	-	60 U	49 U	51 U	-	3.8 U	48 U
Chloroethane	µg/kg	64 U	-	60 U	49 U	51 U	-	3.8 U	48 U
Chloroform (Trichloromethane)	µg/kg	64 U	-	60 U	49 U	51 U	-	0.37 J	48 U
Chloromethane (Methyl chloride)	µg/kg	64 U	-	60 U	49 U	51 U	-	3.8 U	48 U
cis-1,2-Dichloroethene	µg/kg	47 J	-	60 U	49 U	51 U	-	3.8 U	92
cis-1,3-Dichloropropene	µg/kg	64 U	-	60 U	49 U	51 U	-	3.8 U	48 U
Cyclohexane	µg/kg	64 U	-	60 U	49 U	51 U	-	3.8 U	48 U
Dibromochloromethane	µg/kg	64 U	-	60 U	49 U	51 U	-	3.8 U	48 U
Dichlorodifluoromethane (CFC-12)	µg/kg	64 U	-	60 U	49 U	51 U	-	3.8 U	48 U
Ethylbenzene	µg/kg	64 U	-	60 U	49 U	51 U	-	3.8 U	48 U
Isopropyl benzene	µg/kg	64 U	-	60 U	49 U	51 U	-	3.8 U	48 U
Methyl acetate	µg/kg	320 U	-	300 U	240 U	260 U	-	19 U	240 U
Methyl cyclohexane	µg/kg	64 U	-	60 U	49 U	51 U	-	3.8 U	48 U
Methyl tert butyl ether (MTBE)	µg/kg	64 U	-	60 U	49 U	51 U	-	3.8 U	48 U
Methylene chloride	µg/kg	64 U	-	60 U	49 U	51 U	-	3.8 U	48 U
Styrene	µg/kg	64 U	-	60 U	49 U	51 U	-	3.8 U	48 U
Tetrachloroethene	µg/kg	64 U	-	60 U	49 U	51 U	-	3.8 U	48 U
Toluene	µg/kg	64 U	-	60 U	49 U	51 U	-	0.29 J	48 U
trans-1,2-Dichloroethene	µg/kg	64 U	-	60 U	49 U	51 U	-	3.8 U	48 U
trans-1,3-Dichloropropene	µg/kg	64 U	-	60 U	49 U	51 U	-	3.8 U	48 U
Trichloroethene	µg/kg	900	-	310	410	310	-	4.4	910
Trichlorofluoromethane (CFC-11)	µg/kg	64 U	-	60 U	49 U	51 U	-	3.8 U	48 U
Trifluorotrichloroethane (CFC-113)	µg/kg	64 U	-	60 U	49 U	51 U	-	3.8 U	48 U
Vinyl chloride	µg/kg	64 U	-	60 U	49 U	51 U	-	3.8 U	48 U
Xylenes (total)	µg/kg	130 U	-	120 U	97 U	100 U	-	7.6 U	96 U
General Chemistry									
Fraction organic carbon (FOC)	%	-	0.3	-	-	-	0.5	-	-

Notes:

- J - Estimated concentration
- U - Not detected at the associated reporting limit
- UJ - Not detected; associated reporting limit is estimated
- R - Rejected
- ft bgs - Feet Below Ground Surface
- " - " Not applicable
- 2700000

Exceeds Part 375 RUSCO-C criteria
- Exceeds 1,000 ug/kg cleanup goal
- 470
- Exceeds Part 375 PoGW criteria

Table 1

Analytical Results Summary - Soil
Pre-Design Investigation
1130 Niagara Street Site (C915284)
Buffalo, New York

Location ID:		GP-47	GP-48	GP-49	GP-49	GP-49	GP-49	GP-49	GP-50
Sample Name:		S-11219347-111820-AMC-182	S-11219347-111820-AMC-183	S-11219347-112520-AMC-203	S-11219347-112520-AMC-204	S-11219347-112520-AMC-205	S-11219347-112520-AMC-206	S-11219347-112520-AMC-207	S-11219347-111220-AMC-081
Sample Date:		11/18/2020	11/18/2020	11/25/2020	11/25/2020	11/25/2020	11/25/2020	11/25/2020	11/12/2020
Depth:		2.8-4.6 ft. bgs	4-5.4 ft. bgs	8-10 ft. bgs	10-12 ft. bgs	12-14 ft. bgs	14-16.3 ft. bgs	14-16.3 ft. bgs	4-4.6 ft. bgs
		Duplicate						Duplicate	
Parameters	Unit								
Volatile Organic Compounds									
1,1,1-Trichloroethane	µg/kg	610	9100	1.7 J	2.6 J	4.1	4.0 U	0.63 J	4.8 U
1,1,2,2-Tetrachloroethane	µg/kg	60 U	1200 U	4.6 U	4.1 UJ	3.7 U	4.0 U	4.0 U	4.8 U
1,1,2-Trichloroethane	µg/kg	60 U	1200 U	4.6 U	4.1 UJ	3.7 U	4.0 U	4.0 U	4.8 U
1,1-Dichloroethane	µg/kg	60 U	1200 U	4.6 U	4.1 U	0.49 J	4.0 U	4.0 U	4.8 U
1,1-Dichloroethene	µg/kg	47 J	1200 U	4.6 U	0.58 J	2.0 J	4.0 U	4.0 U	4.8 U
1,2,4-Trichlorobenzene	µg/kg	60 U	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U	4.8 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	60 U	1200 U	4.6 U	4.1 UJ	3.7 U	4.0 U	4.0 U	4.8 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	60 U	1200 U	4.6 U	4.1 UJ	3.7 U	4.0 U	4.0 U	4.8 U
1,2-Dichlorobenzene	µg/kg	60 U	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U	4.8 U
1,2-Dichloroethane	µg/kg	60 U	1200 U	4.6 U	4.1 UJ	3.7 U	4.0 U	4.0 U	4.8 U
1,2-Dichloropropane	µg/kg	60 U	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U	4.8 U
1,3-Dichlorobenzene	µg/kg	60 U	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U	4.8 U
1,4-Dichlorobenzene	µg/kg	60 U	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U	4.8 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	300 U	5800 U	23 U	20 UJ	19 U	20 U	20 U	24 U
2-Hexanone	µg/kg	300 U	5800 U	23 U	20 U	19 U	20 U	20 U	24 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	300 U	5800 U	23 U	20 U	19 U	20 U	20 U	24 U
Acetone	µg/kg	300 U	5800 U	23 U	20 U	19 U	20 U	20 U	14 J
Benzene	µg/kg	60 U	1200 U	4.6 U	4.1 UJ	3.7 U	4.0 U	4.0 U	4.8 U
Bromodichloromethane	µg/kg	60 U	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U	4.8 U
Bromoform	µg/kg	60 U	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U	4.8 U
Bromomethane (Methyl bromide)	µg/kg	60 U	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U	4.8 U
Carbon disulfide	µg/kg	60 U	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U	4.8 U
Carbon tetrachloride	µg/kg	60 U	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U	4.8 U
Chlorobenzene	µg/kg	60 U	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U	4.8 U
Chloroethane	µg/kg	60 U	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U	4.8 U
Chloroform (Trichloromethane)	µg/kg	60 U	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	0.25 J	4.8 U
Chloromethane (Methyl chloride)	µg/kg	60 U	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U	4.8 U
cis-1,2-Dichloroethene	µg/kg	160	2100	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U	4.8 U
cis-1,3-Dichloropropene	µg/kg	60 U	1200 U	4.6 U	4.1 UJ	3.7 U	4.0 U	4.0 U	4.8 U
Cyclohexane	µg/kg	60 U	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U	1.5 J
Dibromochloromethane	µg/kg	60 U	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U	4.8 U
Dichlorodifluoromethane (CFC-12)	µg/kg	60 U	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U	4.8 U
Ethylbenzene	µg/kg	60 U	1200 U	4.6 U	4.1 UJ	3.7 U	4.0 U	4.0 U	4.8 U
Isopropyl benzene	µg/kg	60 U	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U	4.8 U
Methyl acetate	µg/kg	300 U	5800 U	23 U	19 U	19 U	20 U	20 U	24 U
Methyl cyclohexane	µg/kg	60 U	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U	1.3 J
Methyl tert butyl ether (MTBE)	µg/kg	60 U	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U	4.8 U
Methylene chloride	µg/kg	60 U	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U	4.8 U
Styrene	µg/kg	60 U	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U	4.8 U
Tetrachloroethene	µg/kg	60 U	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U	4.8 U
Toluene	µg/kg	60 U	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U	4.8 U
trans-1,2-Dichloroethene	µg/kg	60 U	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U	4.8 U
trans-1,3-Dichloropropene	µg/kg	60 U	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U	4.8 U
Trichloroethene	µg/kg	1600	42000	11	18	33	52	46	4.8 U
Trichlorofluoromethane (CFC-11)	µg/kg	60 U	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U	4.8 U
Trifluorotrichloroethane (CFC-113)	µg/kg	60 U	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U	4.8 U
Vinyl chloride	µg/kg	60 U	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U	4.8 U
Xylenes (total)	µg/kg	120 U	2300 U	9.1 U	8.2 U	7.5 U	8.0 U	8.0 U	9.6 U
General Chemistry									
Fraction organic carbon (FOC)	%	-	-	-	-	-	-	-	-

Notes:

- J - Estimated concentration
- U - Not detected at the associated reporting limit
- UJ - Not detected; associated reporting limit is estimated
- R - Rejected
- ft bgs - Feet Below Ground Surface
- " - " Not applicable
- 2700000 Exceeds Part 375 RUSCO-C criteria
- Exceeds 1,000 ug/kg cleanup goal
- 470 Exceeds Part 375 PoGW criteria

Table 1

Analytical Results Summary - Soil
Pre-Design Investigation
1130 Niagara Street Site (C915284)
Buffalo, New York

Location ID: Sample Name: Sample Date: Depth:		GP-51 S-11219347-111020-AMC-022 11/10/2020 2-4 ft. bgs	GP-51 S-11219347-111020-AMC-023 11/10/2020 4-6 ft. bgs	GP-51 S-11219347-111020-AMC-024 11/10/2020 6-8 ft. bgs	GP-51 S-11219347-111020-AMC-025 11/10/2020 8-10 ft. bgs	GP-51 S-11219347-111020-AMC-026 11/10/2020 8-10 ft. bgs Duplicate	GP-51 S-11219347-111020-AMC-027 11/10/2020 10-12.3 ft. bgs	GP-51 S-11219347-111020-AMC-028 11/10/2020 10-11.5 ft. bgs	GP-52 S-11219347-111220-AMC-079 11/12/2020 2-4 ft. bgs
Parameters	Unit								
Volatile Organic Compounds									
1,1,1-Trichloroethane	µg/kg	55 J	57 U	170 J	25 J	50 U	1.3 J	-	4.6 U
1,1,2,2-Tetrachloroethane	µg/kg	110 U	57 U	260 U	49 U	50 U	4.5 UJ	-	4.6 U
1,1,2-Trichloroethane	µg/kg	110 U	57 U	260 U	49 U	50 U	4.5 UJ	-	4.6 U
1,1-Dichloroethane	µg/kg	110 U	57 U	260 U	49 U	50 U	4.5 U	-	4.6 U
1,1-Dichloroethene	µg/kg	110 U	57 U	260 U	49 U	50 U	4.5 U	-	4.6 U
1,2,4-Trichlorobenzene	µg/kg	110 U	57 U	260 U	49 U	50 U	4.5 U	-	4.6 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	110 U	57 U	260 U	49 U	50 U	4.5 UJ	-	4.6 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	110 U	57 U	260 U	49 U	50 U	4.5 UJ	-	4.6 U
1,2-Dichlorobenzene	µg/kg	110 U	57 U	260 U	49 U	50 U	4.5 U	-	4.6 U
1,2-Dichloroethane	µg/kg	110 U	57 U	260 U	49 U	50 U	4.5 UJ	-	4.6 U
1,2-Dichloropropane	µg/kg	110 U	57 U	260 U	49 U	50 U	4.5 U	-	4.6 U
1,3-Dichlorobenzene	µg/kg	110 U	57 U	260 U	49 U	50 U	4.5 U	-	4.6 U
1,4-Dichlorobenzene	µg/kg	110 U	57 U	260 U	49 U	50 U	4.5 U	-	4.6 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	570 U	280 U	1300 U	250 U	250 U	23 UJ	-	4.9 J
2-Hexanone	µg/kg	570 U	280 U	1300 U	250 U	250 U	23 UJ	-	23 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	570 U	280 U	1300 U	250 U	250 U	23 UJ	-	23 U
Acetone	µg/kg	570 U	280 U	1300 U	250 U	250 U	23 UJ	-	23
Benzene	µg/kg	110 U	21 J	260 U	49 U	50 U	4.5 U	-	4.6 U
Bromodichloromethane	µg/kg	110 U	57 U	260 U	49 U	50 U	4.5 U	-	4.6 U
Bromoform	µg/kg	110 U	57 U	260 U	49 U	50 U	4.5 U	-	4.6 U
Bromomethane (Methyl bromide)	µg/kg	110 U	57 U	260 U	49 U	50 U	4.5 U	-	4.6 U
Carbon disulfide	µg/kg	110 U	57 U	260 U	49 U	50 U	4.5 U	-	4.6 U
Carbon tetrachloride	µg/kg	110 U	57 U	260 U	49 U	50 U	4.5 U	-	4.6 U
Chlorobenzene	µg/kg	110 U	57 U	260 U	49 U	50 U	4.5 U	-	4.6 U
Chloroethane	µg/kg	110 U	57 U	260 U	49 U	50 U	4.5 U	-	4.6 U
Chloroform (Trichloromethane)	µg/kg	110 U	57 U	260 U	49 U	50 U	4.5 U	-	4.6 U
Chloromethane (Methyl chloride)	µg/kg	110 U	57 U	260 U	49 U	50 U	4.5 U	-	4.6 U
cis-1,2-Dichloroethene	µg/kg	330	57 U	320	59	86	0.63 J	-	4.6 U
cis-1,3-Dichloropropene	µg/kg	110 U	57 U	260 U	49 U	50 U	4.5 U	-	4.6 U
Cyclohexane	µg/kg	110 U	57 U	260 U	49 U	50 U	4.5 U	-	4.6 U
Dibromochloromethane	µg/kg	110 U	57 U	260 U	49 U	50 U	4.5 U	-	4.6 U
Dichlorodifluoromethane (CFC-12)	µg/kg	110 U	57 U	260 U	49 U	50 U	4.5 U	-	4.6 U
Ethylbenzene	µg/kg	110 U	57 U	260 U	49 U	50 U	4.5 U	-	4.6 U
Isopropyl benzene	µg/kg	110 U	57 U	260 U	49 U	50 U	4.5 U	-	4.6 U
Methyl acetate	µg/kg	570 U	280 U	1300 U	250 U	250 U	23 U	-	23 U
Methyl cyclohexane	µg/kg	110 U	57 U	260 U	49 U	50 U	4.5 U	-	4.6 U
Methyl tert butyl ether (MTBE)	µg/kg	110 U	57 U	260 U	49 U	50 U	4.5 U	-	4.6 U
Methylene chloride	µg/kg	110 U	57 U	260 U	49 U	50 U	4.5 U	-	4.6 U
Styrene	µg/kg	110 U	57 U	260 U	49 U	50 U	4.5 U	-	4.6 U
Tetrachloroethene	µg/kg	110 U	57 U	260 U	49 U	50 U	4.5 U	-	4.6 U
Toluene	µg/kg	110 U	79	260	49 U	50 U	4.5 U	-	4.6 U
trans-1,2-Dichloroethene	µg/kg	110 U	57 U	260 U	49 U	50 U	4.5 U	-	4.6 U
trans-1,3-Dichloropropene	µg/kg	110 U	57 U	260 U	49 U	50 U	4.5 U	-	4.6 U
Trichloroethene	µg/kg	4900	300	13000	970	2000	13	-	4.6 U
Trichlorofluoromethane (CFC-11)	µg/kg	110 U	57 U	260 U	49 U	50 U	4.5 U	-	4.6 U
Trifluorotrichloroethane (CFC-113)	µg/kg	110 U	57 U	260 U	49 U	50 U	4.5 U	-	4.6 U
Vinyl chloride	µg/kg	110 U	57 U	260 U	49 U	50 U	4.5 U	-	4.6 U
Xylenes (total)	µg/kg	230 U	110	320 J	99 U	100 U	9.0 U	-	9.2 U
General Chemistry									
Fraction organic carbon (FOC)	%	-	-	-	-	-	-	0.2	-

Notes:

- J - Estimated concentration
- U - Not detected at the associated reporting limit
- UJ - Not detected; associated reporting limit is estimated
- R - Rejected
- ft bgs - Feet Below Ground Surface
- " - " Not applicable
- 2700000 Exceeds Part 375 RUSCO-C criteria
- Exceeds 1,000 ug/kg cleanup goal
- 470 Exceeds Part 375 PoGW criteria

Table 1

Analytical Results Summary - Soil
Pre-Design Investigation
1130 Niagara Street Site (C915284)
Buffalo, New York

Location ID: Sample Name: Sample Date: Depth:		GP-52 S-11219347-111220-AMC-080 11/12/2020 2-4 ft. bgs Duplicate	GP-53 S-11219347-111220-AMC-082 11/12/2020 2-4 ft. bgs	GP-53 S-11219347-111220-AMC-083 11/12/2020 4-5.6 ft. bgs	GP-53 S-11219347-111220-AMC-084 11/12/2020 5-5.6 ft. bgs	GP-54 S-11219347-111220-AMC-085 11/12/2020 2.5-4 ft. bgs	GP-54 S-11219347-111220-AMC-086 11/12/2020 4-5.2 ft. bgs	GP-55 S-11219347-111820-AMC-184 11/18/2020 5-6.8 ft. bgs	GP-56 S-11219347-111220-AMC-100 11/12/2020 8-10 ft. bgs
Parameters	Unit								
Volatile Organic Compounds									
1,1,1-Trichloroethane	µg/kg	3.9 U	230 U	3.6 U	-	53 U	75	1900	130
1,1,2,2-Tetrachloroethane	µg/kg	3.9 U	230 U	3.6 U	-	53 U	50 U	120 U	66 U
1,1,2-Trichloroethane	µg/kg	3.9 U	230 UJ	3.6 U	-	53 U	50 U	120 U	66 U
1,1-Dichloroethane	µg/kg	3.9 U	230 U	3.9	-	53 U	28 J	310	66 U
1,1-Dichloroethene	µg/kg	3.9 U	230 U	3.6 U	-	53 U	91	1200	66 U
1,2,4-Trichlorobenzene	µg/kg	3.9 U	230 U	3.6 U	-	53 U	50 U	120 U	66 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	3.9 U	230 U	3.6 U	-	53 U	50 U	120 U	66 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	3.9 U	230 U	3.6 U	-	53 U	50 U	120 U	66 U
1,2-Dichlorobenzene	µg/kg	3.9 U	230 U	3.6 U	-	53 U	50 U	120 U	66 U
1,2-Dichloroethane	µg/kg	3.9 U	230 U	0.62 J	-	53 U	50 U	120 U	66 U
1,2-Dichloropropane	µg/kg	3.9 U	230 U	3.6 U	-	53 U	50 U	120 U	66 U
1,3-Dichlorobenzene	µg/kg	3.9 U	230 U	3.6 U	-	53 U	50 U	120 U	66 U
1,4-Dichlorobenzene	µg/kg	3.9 U	230 U	3.6 U	-	53 U	50 U	120 U	66 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	20 U	1200 U	18 U	-	260 U	250 U	610 U	330 U
2-Hexanone	µg/kg	20 U	1200 U	18 U	-	260 U	250 U	610 U	330 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	20 U	1200 U	18 U	-	260 U	250 U	610 U	330 U
Acetone	µg/kg	20 U	1200 U	11 J	-	260 U	250 U	610 U	330 U
Benzene	µg/kg	3.9 U	230 U	3.6 U	-	53 U	50 U	120 U	66 U
Bromodichloromethane	µg/kg	3.9 U	230 U	3.6 U	-	53 U	50 U	120 U	66 U
Bromoform	µg/kg	3.9 U	230 U	3.6 U	-	53 U	50 U	120 U	66 U
Bromomethane (Methyl bromide)	µg/kg	3.9 U	230 U	3.6 U	-	53 U	50 U	120 U	66 U
Carbon disulfide	µg/kg	3.9 U	230 U	3.6 U	-	53 U	50 U	120 U	66 U
Carbon tetrachloride	µg/kg	3.9 U	230 U	3.6 U	-	53 U	50 U	120 U	66 U
Chlorobenzene	µg/kg	3.9 U	230 U	3.6 U	-	53 U	50 U	120 U	66 U
Chloroethane	µg/kg	3.9 U	230 U	3.6 U	-	53 U	50 U	120 U	66 U
Chloroform (Trichloromethane)	µg/kg	3.9 U	230 U	3.6 U	-	53 U	50 U	120 U	66 U
Chloromethane (Methyl chloride)	µg/kg	3.9 U	230 U	3.6 U	-	53 U	50 U	120 U	66 U
cis-1,2-Dichloroethene	µg/kg	3.9 U	230 U	25	-	180	1400	5300	39 J
cis-1,3-Dichloropropene	µg/kg	3.9 U	230 U	3.6 U	-	53 U	50 U	120 U	66 U
Cyclohexane	µg/kg	3.9 U	230 U	3.6 U	-	53 U	50 U	120 U	66 U
Dibromochloromethane	µg/kg	3.9 U	230 U	3.6 U	-	53 U	50 U	120 U	66 U
Dichlorodifluoromethane (CFC-12)	µg/kg	3.9 U	230 U	3.6 U	-	53 U	50 U	120 U	66 U
Ethylbenzene	µg/kg	3.9 U	230 U	3.6 U	-	53 U	50 U	120 U	66 U
Isopropyl benzene	µg/kg	3.9 U	230 U	3.6 U	-	53 U	50 U	120 U	66 U
Methyl acetate	µg/kg	20 U	1200 U	18 U	-	260 U	250 U	720	330 U
Methyl cyclohexane	µg/kg	3.9 U	230 U	0.75 J	-	53 U	50 U	120 U	66 U
Methyl tert butyl ether (MTBE)	µg/kg	3.9 U	230 U	3.6 U	-	53 U	50 U	120 U	66 U
Methylene chloride	µg/kg	3.9 U	230 U	3.6 U	-	53 U	50 U	120 U	66 U
Styrene	µg/kg	3.9 U	230 U	3.6 U	-	53 U	50 U	120 U	66 U
Tetrachloroethene	µg/kg	3.9 U	230 U	3.6 U	-	53 U	50 U	120 U	66 U
Toluene	µg/kg	3.9 U	230 U	3.6 U	-	53 U	50 U	120 U	66 U
trans-1,2-Dichloroethene	µg/kg	3.9 U	230 U	0.59 J	-	53 U	50 U	50 J	66 U
trans-1,3-Dichloropropene	µg/kg	3.9 U	230 U	3.6 U	-	53 U	50 U	120 U	66 U
Trichloroethene	µg/kg	3.9 U	230 U	3.6 U	-	150	970	3300	2200
Trichlorofluoromethane (CFC-11)	µg/kg	3.9 U	230 U	3.6 U	-	53 U	50 U	120 U	66 U
Trifluorotrichloroethane (CFC-113)	µg/kg	3.9 U	230 U	3.6 U	-	53 U	50 U	120 U	66 U
Vinyl chloride	µg/kg	3.9 U	230 U	7.0	-	53 U	50 U	120 U	66 U
Xylenes (total)	µg/kg	7.9 U	460 U	7.2 U	-	110 U	100 U	240 U	130 U
General Chemistry									
Fraction organic carbon (FOC)	%	-	-	-	0.4	-	-	-	-

Notes:

- J - Estimated concentration
- U - Not detected at the associated reporting limit
- UJ - Not detected; associated reporting limit is estimated
- R - Rejected
- ft bgs - Feet Below Ground Surface
- " - " Not applicable
- 2700000 Exceeds Part 375 RUSCO-C criteria
- Exceeds 1,000 ug/kg cleanup goal
- 470 Exceeds Part 375 PoGW criteria

Table 1									
Analytical Results Summary - Soil Pre-Design Investigation 1130 Niagara Street Site (C915284) Buffalo, New York									
Location ID: Sample Name: Sample Date: Depth:		GP-56 S-11219347-111220-AMC-101 11/12/2020 10-10.6 ft. bgs	GP-57 S-11219347-110920-AMC-017 11/09/2020 2-4 ft. bgs	GP-57 S-11219347-110920-AMC-018 11/09/2020 4-6 ft. bgs	GP-57 S-11219347-110920-AMC-019 11/09/2020 6-8 ft. bgs	GP-57 S-11219347-110920-AMC-020 11/09/2020 8-10 ft. bgs	GP-57 S-11219347-110920-AMC-021 11/09/2020 10-11.5 ft. bgs	GP-58 S-11219347-112420-AMC-200 11/24/2020 6-8 ft. bgs	GP-58 S-11219347-112420-AMC-201 11/24/2020 8-10 ft. bgs
Parameters	Unit								
Volatile Organic Compounds									
1,1,1-Trichloroethane	µg/kg	500	1.8 J	69	91	6.0 U	4.2 U	4.4 U	3.8 U
1,1,2,2-Tetrachloroethane	µg/kg	190 U	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U	3.8 U
1,1,2-Trichloroethane	µg/kg	190 U	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U	3.8 U
1,1-Dichloroethane	µg/kg	190 U	5.1 U	60 U	68 U	1.4 J	4.2 U	4.4 U	3.8 U
1,1-Dichloroethene	µg/kg	190 U	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U	3.8 U
1,2,4-Trichlorobenzene	µg/kg	190 U	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U	3.8 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	190 U	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U	3.8 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	190 U	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U	3.8 U
1,2-Dichlorobenzene	µg/kg	190 U	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U	3.8 U
1,2-Dichloroethane	µg/kg	190 U	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U	3.8 U
1,2-Dichloropropane	µg/kg	190 U	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U	3.8 U
1,3-Dichlorobenzene	µg/kg	190 U	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U	3.8 U
1,4-Dichlorobenzene	µg/kg	190 U	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U	3.8 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	960 U	26 U	300 U	340 U	20 J	21 U	22 U	2.4 J
2-Hexanone	µg/kg	960 U	26 U	300 U	340 U	30 U	22 U	19 U	
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	960 U	26 U	300 U	340 U	30 U	21 U	22 U	19 U
Acetone	µg/kg	960 U	26 U	300 U	340 U	85	15 J	11 J	12 J
Benzene	µg/kg	190 U	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U	3.8 U
Bromodichloromethane	µg/kg	190 U	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U	3.8 U
Bromoform	µg/kg	190 U	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U	3.8 U
Bromomethane (Methyl bromide)	µg/kg	190 U	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U	3.8 U
Carbon disulfide	µg/kg	190 U	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U	3.8 U
Carbon tetrachloride	µg/kg	190 U	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U	3.8 U
Chlorobenzene	µg/kg	190 U	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U	3.8 U
Chloroethane	µg/kg	190 U	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U	3.8 U
Chloroform (Trichloromethane)	µg/kg	190 U	0.84 J	60 U	68 U	6.0 U	4.2 U	4.4 U	3.8 U
Chloromethane (Methyl chloride)	µg/kg	190 U	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U	3.8 U
cis-1,2-Dichloroethene	µg/kg	190 U	5.1 U	60 U	68 U	2.5 J	0.91 J	4.4 U	3.8 U
cis-1,3-Dichloropropene	µg/kg	190 U	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U	3.8 U
Cyclohexane	µg/kg	190 U	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U	3.8 U
Dibromochloromethane	µg/kg	190 U	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U	3.8 U
Dichlorodifluoromethane (CFC-12)	µg/kg	190 U	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U	3.8 U
Ethylbenzene	µg/kg	190 U	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U	3.8 U
Isopropyl benzene	µg/kg	190 U	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U	3.8 U
Methyl acetate	µg/kg	960 U	26 U	300 U	340 U	30 U	21 U	22 U	19 U
Methyl cyclohexane	µg/kg	190 U	5.1 U	55 J	68 U	6.0 U	4.2 U	4.4 U	1.2 J
Methyl tert butyl ether (MTBE)	µg/kg	190 U	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U	3.8 U
Methylene chloride	µg/kg	190 U	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U	3.8 U
Styrene	µg/kg	190 U	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U	3.8 U
Tetrachloroethene	µg/kg	190 U	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U	3.8 U
Toluene	µg/kg	190 U	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U	3.8 U
trans-1,2-Dichloroethene	µg/kg	190 U	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U	3.8 U
trans-1,3-Dichloropropene	µg/kg	190 U	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U	3.8 U
Trichloroethene	µg/kg	7300	17	1700	1600	1.4 J	3.7 J	4.4 U	0.97 J
Trichlorofluoromethane (CFC-11)	µg/kg	190 U	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U	3.8 U
Trifluorotrichloroethane (CFC-113)	µg/kg	190 U	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U	3.8 U
Vinyl chloride	µg/kg	190 U	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U	3.8 U
Xylenes (total)	µg/kg	380 U	10 U	120 U	140 U	12 U	8.5 U	8.9 U	7.7 U
General Chemistry									
Fraction organic carbon (FOC)	%	-	-	-	-	-	-	-	-
Notes:									
J - Estimated concentration									
U - Not detected at the associated reporting limit									
UJ - Not detected; associated reporting limit is estimated									
R - Rejected									
ft bgs - Feet Below Ground Surface									
" - " Not applicable									
2700000	Exceeds Part 375 RUSCO-C criteria								
	Exceeds 1,000 ug/kg cleanup goal								
470	Exceeds Part 375 PoGW criteria								

Table 1

Analytical Results Summary - Soil
Pre-Design Investigation
1130 Niagara Street Site (C915284)
Buffalo, New York

Location ID:		GP-58	GP-59	GP-59	GP-59	GP-60	GP-60	GP-61	GP-61
Sample Name:		S-11219347-112420-AMC-202	S-11219347-110920-AMC-001	S-11219347-110920-AMC-002	S-11219347-110920-AMC-003	S-11219347-110920-AMC-004	S-11219347-110920-AMC-005	S-11219347-110920-AMC-006	S-11219347-110920-AMC-007
Sample Date:		11/24/2020	11/09/2020	11/09/2020	11/09/2020	11/09/2020	11/09/2020	11/09/2020	11/09/2020
Depth:		10-11.6 ft. bgs	3-4 ft. bgs	4-4.9 ft. bgs	0-2 ft. bgs	2-4 ft. bgs	4-4.9 ft. bgs	2-4 ft. bgs	4-6 ft. bgs
Parameters	Unit								
Volatile Organic Compounds									
1,1,1-Trichloroethane	µg/kg	4.1 U	4.2 U	3.8 U	-	0.65 J	4.2 U	110 U	70
1,1,2,2-Tetrachloroethane	µg/kg	4.1 U	4.2 U	3.8 U	-	4.3 U	4.2 U	110 U	60 U
1,1,2-Trichloroethane	µg/kg	4.1 U	4.2 U	3.8 U	-	4.3 U	4.2 U	110 U	60 U
1,1-Dichloroethane	µg/kg	4.1 U	4.2 U	3.8 U	-	4.3 U	4.2 U	97 J	170
1,1-Dichloroethene	µg/kg	4.1 U	4.2 U	3.8 U	-	4.3 U	4.2 U	110 U	35 J
1,2,4-Trichlorobenzene	µg/kg	4.1 U	4.2 U	3.8 U	-	4.3 U	4.2 U	110 U	60 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	4.1 U	4.2 U	3.8 U	-	4.3 U	4.2 U	110 U	60 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	4.1 U	4.2 U	3.8 U	-	4.3 U	4.2 U	110 U	60 U
1,2-Dichlorobenzene	µg/kg	4.1 U	4.2 U	3.8 U	-	4.3 U	4.2 U	110 U	60 U
1,2-Dichloroethane	µg/kg	4.1 U	4.2 U	3.8 U	-	4.3 U	4.2 U	110 U	60 U
1,2-Dichloropropane	µg/kg	4.1 U	4.2 U	3.8 U	-	4.3 U	4.2 U	110 U	60 U
1,3-Dichlorobenzene	µg/kg	4.1 U	4.2 U	3.8 U	-	4.3 U	4.2 U	110 U	60 U
1,4-Dichlorobenzene	µg/kg	4.1 U	4.2 U	3.8 U	-	4.3 U	4.2 U	110 U	60 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	21 U	21 U	19 U	-	22 U	21 U	570 U	300 U
2-Hexanone	µg/kg	21 U	21 U	19 U	-	22 U	21 U	570 U	300 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	21 U	21 U	19 U	-	22 U	21 U	570 U	300 U
Acetone	µg/kg	6.2 J	21 U	19 U	-	22 U	21 U	570 U	300 U
Benzene	µg/kg	4.1 U	4.2 U	3.8 U	-	4.3 U	4.2 U	110 U	60 U
Bromodichloromethane	µg/kg	4.1 U	4.2 U	3.8 U	-	4.3 U	4.2 U	110 U	60 U
Bromoform	µg/kg	4.1 U	4.2 U	3.8 U	-	4.3 U	4.2 U	110 U	60 U
Bromomethane (Methyl bromide)	µg/kg	4.1 U	4.2 U	3.8 U	-	4.3 U	4.2 U	110 U	60 U
Carbon disulfide	µg/kg	4.1 U	4.2 U	3.8 U	-	4.3 U	4.2 U	110 U	60 U
Carbon tetrachloride	µg/kg	4.1 U	4.2 U	3.8 U	-	4.3 U	4.2 U	110 U	60 U
Chlorobenzene	µg/kg	4.1 U	4.2 U	3.8 U	-	4.3 U	4.2 U	110 U	60 U
Chloroethane	µg/kg	4.1 U	4.2 U	3.8 U	-	4.3 U	4.2 U	110 U	60 U
Chloroform (Trichloromethane)	µg/kg	4.1 U	4.2 U	3.8 U	-	4.3 U	4.2 U	110 U	60 U
Chloromethane (Methyl chloride)	µg/kg	4.1 U	4.2 U	3.8 U	-	4.3 U	4.2 U	110 U	60 U
cis-1,2-Dichloroethene	µg/kg	4.1 U	4.2 U	3.8 U	-	4.3 U	1.3 J	1200	1200
cis-1,3-Dichloropropene	µg/kg	4.1 U	4.2 U	3.8 U	-	4.3 U	4.2 U	110 U	60 U
Cyclohexane	µg/kg	4.1 U	4.2 U	3.8 U	-	4.3 U	4.2 U	110 U	60 U
Dibromochloromethane	µg/kg	4.1 U	4.2 U	3.8 U	-	4.3 U	4.2 U	110 U	60 U
Dichlorodifluoromethane (CFC-12)	µg/kg	4.1 U	4.2 U	3.8 U	-	4.3 U	4.2 U	110 U	60 U
Ethylbenzene	µg/kg	4.1 U	4.2 U	3.8 U	-	4.3 U	4.2 U	110 U	60 U
Isopropyl benzene	µg/kg	4.1 U	4.2 U	3.8 U	-	4.3 U	4.2 U	110 U	60 U
Methyl acetate	µg/kg	21 U	21 U	19 U	-	22 U	21 U	570 U	300 U
Methyl cyclohexane	µg/kg	4.1 U	4.2 U	3.8 U	-	4.3 U	4.2 U	110 U	60 U
Methyl tert butyl ether (MTBE)	µg/kg	4.1 U	4.2 U	3.8 U	-	4.3 U	4.2 U	110 U	60 U
Methylene chloride	µg/kg	4.1 U	4.2 U	3.8 U	-	4.3 U	4.2 U	110 U	60 U
Styrene	µg/kg	4.1 U	4.2 U	3.8 U	-	4.3 U	4.2 U	110 U	60 U
Tetrachloroethene	µg/kg	4.1 U	4.2 U	3.8 U	-	4.3 U	4.2 U	110 U	60 U
Toluene	µg/kg	4.1 U	4.2 U	3.8 U	-	4.3 U	4.2 U	110 U	60 U
trans-1,2-Dichloroethene	µg/kg	4.1 U	4.2 U	3.8 U	-	4.3 U	4.2 U	110 U	24 J
trans-1,3-Dichloropropene	µg/kg	4.1 U	4.2 U	3.8 U	-	4.3 U	4.2 U	110 U	60 U
Trichloroethene	µg/kg	1.2 J	4.2 U	3.8 U	-	6.3	5.9	200	670
Trichlorofluoromethane (CFC-11)	µg/kg	4.1 U	4.2 U	3.8 U	-	4.3 U	4.2 U	110 U	60 U
Trifluorotrichloroethane (CFC-113)	µg/kg	4.1 U	4.2 U	3.8 U	-	4.3 U	4.2 U	110 U	60 U
Vinyl chloride	µg/kg	4.1 U	4.2 U	3.8 U	-	4.3 U	4.2 U	110 U	60 U
Xylenes (total)	µg/kg	8.3 U	8.3 U	7.7 U	-	8.6 U	8.3 U	230 U	120 U
General Chemistry									
Fraction organic carbon (FOC)	%	-	-	-	1.8	-	-	-	-

Notes:

- J - Estimated concentration
- U - Not detected at the associated reporting limit
- UJ - Not detected; associated reporting limit is estimated
- R - Rejected
- ft bgs - Feet Below Ground Surface
- " - " Not applicable
- 2700000 Exceeds Part 375 RUSCO-C criteria
- Exceeds 1,000 ug/kg cleanup goal
- 470 Exceeds Part 375 PoGW criteria

Table 1

Analytical Results Summary - Soil
Pre-Design Investigation
1130 Niagara Street Site (C915284)
Buffalo, New York

Location ID:		GP-61	GP-62	GP-62	GP-62	GP-63	GP-63	GP-63	GP-64
Sample Name:		S-11219347-110920-AMC-008	S-11219347-110920-AMC-010	S-11219347-110920-AMC-011	S-11219347-110920-AMC-012	S-11219347-110920-AMC-013	S-11219347-110920-AMC-014	S-11219347-110920-AMC-015	S-11219347-112420-AMC-198
Sample Date:		11/09/2020	11/09/2020	11/09/2020	11/09/2020	11/09/2020	11/09/2020	11/09/2020	11/24/2020
Depth:		6-6.5 ft. bgs	4-6 ft. bgs	6-8 ft. bgs	8-9.7 ft. bgs	6.5-8 ft. bgs	8-10 ft. bgs	10-11 ft. bgs	8-10 ft. bgs
Parameters	Unit								
Volatile Organic Compounds									
1,1,1-Trichloroethane	µg/kg	95	110 U	66 U	98	4.3 U	4.2 U	1.1 J	4.1 U
1,1,2,2-Tetrachloroethane	µg/kg	60 U	110 U	66 U	60 U	4.3 U	4.2 U	4.4 U	4.1 U
1,1,2-Trichloroethane	µg/kg	60 U	110 U	66 U	60 U	4.3 U	4.2 U	4.4 U	4.1 U
1,1-Dichloroethane	µg/kg	21 J	110 U	97	60 U	4.3 U	1.4 J	4.4 U	0.90 J
1,1-Dichloroethene	µg/kg	60 U	110 U	66 U	85	4.3 U	4.2 U	4.4 U	4.1 U
1,2,4-Trichlorobenzene	µg/kg	60 U	110 U	66 U	60 U	4.3 U	4.2 U	4.4 U	4.1 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	60 U	110 U	66 U	60 U	4.3 U	4.2 U	4.4 U	4.1 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	60 U	110 U	66 U	60 U	4.3 U	4.2 U	4.4 U	4.1 U
1,2-Dichlorobenzene	µg/kg	60 U	110 U	66 U	60 U	4.3 U	4.2 U	4.4 U	4.1 U
1,2-Dichloroethane	µg/kg	60 U	110 U	66 U	60 U	4.3 U	4.2 U	4.4 U	4.1 U
1,2-Dichloropropane	µg/kg	60 U	110 U	66 U	60 U	4.3 U	4.2 U	4.4 U	4.1 U
1,3-Dichlorobenzene	µg/kg	60 U	110 U	66 U	60 U	4.3 U	4.2 U	4.4 U	4.1 U
1,4-Dichlorobenzene	µg/kg	60 U	110 U	66 U	60 U	4.3 U	4.2 U	4.4 U	4.1 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	300 U	550 U	330 U	300 U	22 U	21 U	22 U	20 U
2-Hexanone	µg/kg	300 U	550 U	330 U	300 U	22 U	21 U	22 U	20 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	300 U	550 U	330 U	300 U	22 U	21 U	22 U	20 U
Acetone	µg/kg	300 U	550 U	330 U	300 U	17 J	11 J	22 U	20 U
Benzene	µg/kg	60 U	110 U	66 U	60 U	4.3 U	4.2 U	4.4 U	4.1 U
Bromodichloromethane	µg/kg	60 U	110 U	66 U	60 U	4.3 U	4.2 U	4.4 U	4.1 U
Bromoform	µg/kg	60 U	110 U	66 U	60 U	4.3 U	4.2 U	4.4 U	4.1 U
Bromomethane (Methyl bromide)	µg/kg	60 U	110 U	66 U	60 U	4.3 U	4.2 U	4.4 U	4.1 U
Carbon disulfide	µg/kg	60 U	110 U	66 U	60 U	4.3 U	4.2 U	4.4 U	4.1 U
Carbon tetrachloride	µg/kg	60 U	110 U	66 U	60 U	4.3 U	4.2 U	4.4 U	4.1 U
Chlorobenzene	µg/kg	60 U	110 U	66 U	60 U	4.3 U	4.2 U	4.4 U	4.1 U
Chloroethane	µg/kg	60 U	110 U	66 U	60 U	4.3 U	4.2 U	4.4 U	4.1 U
Chloroform (Trichloromethane)	µg/kg	60 U	110 U	66 U	60 U	4.3 U	4.2 U	4.4 U	4.1 U
Chloromethane (Methyl chloride)	µg/kg	60 U	110 U	66 U	60 U	4.3 U	4.2 U	4.4 U	4.1 U
cis-1,2-Dichloroethene	µg/kg	93	390	210	270	1.3 J	3.6 J	1.9 J	1.9 J
cis-1,3-Dichloropropene	µg/kg	60 U	110 U	66 U	60 U	4.3 U	4.2 U	4.4 U	4.1 U
Cyclohexane	µg/kg	60 U	110 U	66 U	60 U	4.3 U	4.2 U	4.4 U	4.1 U
Dibromochloromethane	µg/kg	60 U	110 U	66 U	60 U	4.3 U	4.2 U	4.4 U	4.1 U
Dichlorodifluoromethane (CFC-12)	µg/kg	60 U	110 U	66 U	60 U	4.3 U	4.2 U	4.4 U	4.1 U
Ethylbenzene	µg/kg	60 U	110 U	66 U	60 U	4.3 U	4.2 U	4.4 U	4.1 U
Isopropyl benzene	µg/kg	60 U	110 U	66 U	60 U	4.3 U	4.2 U	4.4 U	4.1 U
Methyl acetate	µg/kg	300 U	550 U	110 J	1500	22 U	21 U	22 U	20 U
Methyl cyclohexane	µg/kg	60 U	110 U	66 U	60 U	4.3 U	4.2 U	4.4 U	4.1 U
Methyl tert butyl ether (MTBE)	µg/kg	60 U	110 U	66 U	60 U	4.3 U	4.2 U	4.4 U	4.1 U
Methylene chloride	µg/kg	60 U	110 U	66 U	60 U	4.3 U	4.2 U	4.4 U	4.1 U
Styrene	µg/kg	60 U	110 U	66 U	60 U	4.3 U	4.2 U	4.4 U	4.1 U
Tetrachloroethene	µg/kg	60 U	110 U	66 U	60 U	4.3 U	4.2 U	4.4 U	4.1 U
Toluene	µg/kg	60 U	110 U	66 U	60 U	4.3 U	4.2 U	4.4 U	4.1 U
trans-1,2-Dichloroethene	µg/kg	60 U	64 J	66 U	22 J	4.3 U	4.2 U	4.4 U	4.1 U
trans-1,3-Dichloropropene	µg/kg	60 U	110 U	66 U	60 U	4.3 U	4.2 U	4.4 U	4.1 U
Trichloroethene	µg/kg	360	1400	470	1100	1.1 J	2.7 J	30	3.3 J
Trichlorofluoromethane (CFC-11)	µg/kg	60 U	110 U	66 U	160	4.3 U	4.2 U	4.4 U	4.1 U
Trifluorotrichloroethane (CFC-113)	µg/kg	60 U	110 U	66 U	60 U	4.3 U	4.2 U	4.4 U	4.1 U
Vinyl chloride	µg/kg	60 U	110 U	66 U	60 U	4.3 U	1.1 J	4.4 U	4.1 U
Xylenes (total)	µg/kg	120 U	220 U	130 U	120 U	8.7 U	8.4 U	8.8 U	8.2 U
General Chemistry									
Fraction organic carbon (FOC)	%	-	-	-	-	-	-	-	-

Notes:

- J - Estimated concentration
- U - Not detected at the associated reporting limit
- UJ - Not detected; associated reporting limit is estimated
- R - Rejected
- ft bgs - Feet Below Ground Surface
- " - " Not applicable
- 2700000 Exceeds Part 375 RUSCO-C criteria
- Exceeds 1,000 ug/kg cleanup goal
- 470 Exceeds Part 375 PoGW criteria

Table 1

Analytical Results Summary - Soil
Pre-Design Investigation
1130 Niagara Street Site (C915284)
Buffalo, New York

Location ID:		GP-64	GP-67	GP-67	GP-67	GP-68	GP-68	GP-68	GP-69
Sample Name:		S-11219347-112420-AMC-199	S-11219347-111720-AMC-169	S-11219347-111720-AMC-170	S-11219347-111720-AMC-171	S-11219347-111720-AMC-172	S-11219347-111720-AMC-173	S-11219347-111720-AMC-174	S-11219347-111820-AMC-179
Sample Date:		11/24/2020	11/17/2020	11/17/2020	11/17/2020	11/17/2020	11/17/2020	11/17/2020	11/18/2020
Depth:		10-11.8 ft. bgs	2-4 ft. bgs	4-5.4 ft. bgs	4-5.4 ft. bgs	2-4 ft. bgs	4-6 ft. bgs	6-7.4 ft. bgs	8-9.8 ft. bgs
Parameters	Unit								
Volatile Organic Compounds									
1,1,1-Trichloroethane	µg/kg	0.58 J	4.2 U	4.5 U	-	61 U	5.9 U	240	3.5 U
1,1,2,2-Tetrachloroethane	µg/kg	3.9 U	4.2 U	4.5 U	-	61 U	5.9 U	19 U	3.5 UJ
1,1,2-Trichloroethane	µg/kg	3.9 U	4.2 U	4.5 U	-	61 U	5.9 U	19 U	3.5 UJ
1,1-Dichloroethane	µg/kg	3.9 U	4.2 U	1.6 J	-	61 U	3.0 J	17 J	0.81 J
1,1-Dichloroethene	µg/kg	3.9 U	4.2 U	4.5 U	-	61 U	5.9 U	81	3.5 U
1,2,4-Trichlorobenzene	µg/kg	3.9 U	4.2 U	4.5 U	-	61 U	5.9 U	19 U	3.5 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	3.9 U	4.2 U	4.5 U	-	61 U	5.9 U	19 U	3.5 UJ
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	3.9 U	4.2 U	4.5 U	-	61 U	5.9 U	19 U	3.5 UJ
1,2-Dichlorobenzene	µg/kg	3.9 U	4.2 U	4.5 U	-	61 U	5.9 U	19 U	3.5 U
1,2-Dichloroethane	µg/kg	3.9 U	4.2 U	4.5 U	-	61 U	5.9 U	19 U	3.5 U
1,2-Dichloropropane	µg/kg	3.9 U	4.2 U	4.5 U	-	61 U	5.9 U	19 U	3.5 U
1,3-Dichlorobenzene	µg/kg	3.9 U	4.2 U	4.5 U	-	61 U	5.9 U	19 U	3.5 U
1,4-Dichlorobenzene	µg/kg	3.9 U	4.2 U	4.5 U	-	61 U	5.9 U	19 U	3.5 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	19 U	4.2 J	22 U	-	310 U	17 J	96 U	18 UJ
2-Hexanone	µg/kg	19 U	21 U	22 U	-	310 U	29 U	96 U	18 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	19 U	21 U	22 U	-	310 U	29 U	96 U	18 UJ
Acetone	µg/kg	19 U	22	17 J	-	310 U	67	96 U	18 U
Benzene	µg/kg	3.9 U	4.2 U	4.5 U	-	61 U	5.9 U	19 U	3.5 U
Bromodichloromethane	µg/kg	3.9 U	4.2 U	4.5 U	-	61 U	5.9 U	19 U	3.5 U
Bromoform	µg/kg	3.9 U	4.2 U	4.5 U	-	61 U	5.9 U	19 U	3.5 U
Bromomethane (Methyl bromide)	µg/kg	3.9 U	4.2 U	4.5 U	-	61 U	5.9 U	19 U	3.5 U
Carbon disulfide	µg/kg	3.9 U	4.2 U	4.5 U	-	61 U	5.9 U	19 U	3.5 U
Carbon tetrachloride	µg/kg	3.9 U	4.2 U	4.5 U	-	61 U	5.9 U	19 U	3.5 U
Chlorobenzene	µg/kg	3.9 U	4.2 U	4.5 U	-	61 U	5.9 U	19 U	3.5 U
Chloroethane	µg/kg	3.9 U	4.2 U	4.5 U	-	61 U	5.9 U	19 U	3.5 U
Chloroform (Trichloromethane)	µg/kg	3.9 U	4.2 U	4.5 U	-	61 U	5.9 U	19 U	3.5 U
Chloromethane (Methyl chloride)	µg/kg	3.9 U	4.2 U	4.5 U	-	61 U	5.9 U	19 U	3.5 U
cis-1,2-Dichloroethene	µg/kg	1.4 J	0.84 J	0.99 J	-	150	1.3 J	110	2.3 J
cis-1,3-Dichloropropene	µg/kg	3.9 U	4.2 U	4.5 U	-	61 U	5.9 U	19 U	3.5 U
Cyclohexane	µg/kg	3.9 U	4.2 U	4.5 U	-	61 U	5.9 U	19 U	3.5 U
Dibromochloromethane	µg/kg	3.9 U	4.2 U	4.5 U	-	61 U	5.9 U	19 U	3.5 U
Dichlorodifluoromethane (CFC-12)	µg/kg	3.9 U	4.2 U	4.5 U	-	61 U	5.9 U	19 U	3.5 U
Ethylbenzene	µg/kg	3.9 U	4.2 U	4.5 U	-	61 U	5.9 U	19 U	3.5 U
Isopropyl benzene	µg/kg	3.9 U	4.2 U	4.5 U	-	61 U	5.9 U	19 U	3.5 U
Methyl acetate	µg/kg	19 U	21 U	22 U	-	310 U	29 U	180	18 U
Methyl cyclohexane	µg/kg	3.9 U	4.2 U	4.5 U	-	61 U	5.9 U	19 U	3.5 U
Methyl tert butyl ether (MTBE)	µg/kg	3.9 U	4.2 U	4.5 U	-	61 U	5.9 U	19 U	3.5 U
Methylene chloride	µg/kg	3.9 U	4.2 U	4.5 U	-	61 U	5.9 U	19 U	3.5 U
Styrene	µg/kg	3.9 U	4.2 U	4.5 U	-	61 U	5.9 U	19 U	3.5 U
Tetrachloroethene	µg/kg	3.9 U	4.2 U	4.5 U	-	61 U	5.9 U	19 U	3.5 U
Toluene	µg/kg	3.9 U	4.2 U	4.5 U	-	61 U	5.9 U	19 U	3.5 U
trans-1,2-Dichloroethene	µg/kg	3.9 U	4.2 U	4.5 U	-	61 U	5.9 U	19 U	3.5 U
trans-1,3-Dichloropropene	µg/kg	3.9 U	4.2 U	4.5 U	-	61 U	5.9 U	19 U	3.5 U
Trichloroethene	µg/kg	5.9	4.2 U	4.5 U	-	890	5.9 U	610	4.9
Trichlorofluoromethane (CFC-11)	µg/kg	3.9 U	4.2 U	4.5 U	-	61 U	5.9 U	19 U	3.5 U
Trifluorotrichloroethane (CFC-113)	µg/kg	3.9 U	4.2 U	4.5 U	-	61 U	5.9 U	19 U	3.5 U
Vinyl chloride	µg/kg	3.9 U	4.2 U	4.5 U	-	61 U	5.9 U	19 U	3.5 U
Xylenes (total)	µg/kg	7.7 U	8.4 U	8.9 U	-	120 U	12 U	38 U	7.1 U
General Chemistry									
Fraction organic carbon (FOC)	%	-	-	-	1.3	-	-	-	-

Notes:

- J - Estimated concentration
- U - Not detected at the associated reporting limit
- UJ - Not detected; associated reporting limit is estimated
- R - Rejected
- ft bgs - Feet Below Ground Surface
- " - " Not applicable
- 2700000

Exceeds Part 375 RUSCO-C criteria
- Exceeds 1,000 ug/kg cleanup goal
- 470

Exceeds Part 375 PoGW criteria

Table 1									
Analytical Results Summary - Soil Pre-Design Investigation 1130 Niagara Street Site (C915284) Buffalo, New York									
Location ID: Sample Name: Sample Date: Depth:		MW-106 S-11219347-112020-AMC-189 11/20/2020 0.5-2 ft. bgs	MW-106 S-11219347-112020-AMC-190 11/20/2020 2-4 ft. bgs	MW-106 S-11219347-112020-AMC-191 11/20/2020 4-6 ft. bgs	MW-106 S-11219347-112020-AMC-192 11/20/2020 6-8 ft. bgs	MW-106 S-11219347-112020-AMC-193 11/20/2020 8-10 ft. bgs	MW-106 S-11219347-112020-AMC-194 11/20/2020 8-10 ft. bgs Duplicate	MW-106 S-11219347-112020-AMC-195 11/20/2020 10-12 ft. bgs	MW-106 S-11219347-112020-AMC-196 11/20/2020 12-14 ft. bgs
Parameters	Unit								
Volatile Organic Compounds									
1,1,1-Trichloroethane	µg/kg	0.62 J	1.2 J	47 J	44 J	43 J	75 U	55	53
1,1,2,2-Tetrachloroethane	µg/kg	5.1 U	4.5 U	91 U	54 U	54 U	75 U	46 U	47 U
1,1,2-Trichloroethane	µg/kg	5.1 U	4.5 U	91 U	54 U	54 U	75 U	46 U	47 U
1,1-Dichloroethane	µg/kg	5.1 U	4.5 U	91 U	54 U	54 U	75 U	46 U	47 U
1,1-Dichloroethene	µg/kg	5.1 U	4.5 U	91 U	54 U	54 U	75 U	19 J	27 J
1,2,4-Trichlorobenzene	µg/kg	5.1 U	4.5 U	91 U	54 U	54 U	75 U	46 U	47 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	5.1 U	4.5 U	91 U	54 U	54 U	75 U	46 U	47 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	5.1 U	4.5 U	91 U	54 U	54 U	75 U	46 U	47 U
1,2-Dichlorobenzene	µg/kg	5.1 U	4.5 U	91 U	54 U	54 U	75 U	46 U	47 U
1,2-Dichloroethane	µg/kg	5.1 U	4.5 U	91 U	54 U	54 U	75 U	46 U	47 U
1,2-Dichloropropane	µg/kg	5.1 U	4.5 U	91 U	54 U	54 U	75 U	46 U	47 U
1,3-Dichlorobenzene	µg/kg	5.1 U	4.5 U	91 U	54 U	54 U	75 U	46 U	47 U
1,4-Dichlorobenzene	µg/kg	5.1 U	4.5 U	91 U	54 U	54 U	75 U	46 U	47 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	25 U	23 U	460 U	270 U	270 U	380 U	230 U	230 U
2-Hexanone	µg/kg	25 U	23 U	460 U	270 U	270 U	380 U	230 U	230 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	25 U	23 U	460 U	270 U	270 U	380 U	230 U	230 U
Acetone	µg/kg	25 U	23 U	460 U	270 U	270 U	380 U	230 U	230 U
Benzene	µg/kg	5.1 U	4.5 U	91 U	54 U	54 U	75 U	46 U	47 U
Bromodichloromethane	µg/kg	5.1 U	4.5 U	91 U	54 U	54 U	75 U	46 U	47 U
Bromoform	µg/kg	5.1 U	4.5 U	91 U	54 U	54 U	75 U	46 U	47 U
Bromomethane (Methyl bromide)	µg/kg	5.1 U	4.5 U	91 U	54 U	54 U	75 U	46 U	47 U
Carbon disulfide	µg/kg	5.1 U	4.5 U	91 U	54 U	54 U	75 U	46 U	47 U
Carbon tetrachloride	µg/kg	5.1 U	4.5 U	91 U	54 U	54 U	75 U	46 U	47 U
Chlorobenzene	µg/kg	5.1 U	4.5 U	91 U	54 U	54 U	75 U	46 U	47 U
Chloroethane	µg/kg	5.1 U	4.5 U	91 U	54 U	54 U	75 U	46 U	47 U
Chloroform (Trichloromethane)	µg/kg	5.1 U	4.5 U	91 U	54 U	54 U	75 U	46 U	47 U
Chloromethane (Methyl chloride)	µg/kg	5.1 U	4.5 U	91 U	54 U	54 U	75 U	46 U	47 U
cis-1,2-Dichloroethene	µg/kg	5.1 U	4.5 U	91 U	25 J	36 J	27 J	46 U	47 U
cis-1,3-Dichloropropene	µg/kg	5.1 U	4.5 U	91 U	54 U	54 U	75 U	46 U	47 U
Cyclohexane	µg/kg	5.1 U	4.5 U	91 U	54 U	54 U	75 U	46 U	47 U
Dibromochloromethane	µg/kg	5.1 U	4.5 U	91 U	54 U	54 U	75 U	46 U	47 U
Dichlorodifluoromethane (CFC-12)	µg/kg	5.1 U	4.5 U	91 U	54 U	54 U	75 U	46 U	47 U
Ethylbenzene	µg/kg	5.1 U	4.5 U	91 U	54 U	54 U	75 U	46 U	47 U
Isopropyl benzene	µg/kg	5.1 U	4.5 U	91 U	54 U	54 U	75 U	46 U	47 U
Methyl acetate	µg/kg	25 U	23 U	460 U	270 U	270 U	380 U	230 U	230 U
Methyl cyclohexane	µg/kg	5.1 U	4.5 U	91 U	54 U	54 U	75 U	46 U	47 U
Methyl tert butyl ether (MTBE)	µg/kg	5.1 U	4.5 U	91 U	54 U	54 U	75 U	46 U	47 U
Methylene chloride	µg/kg	5.1 U	4.5 U	91 U	54 U	54 U	75 U	46 U	47 U
Styrene	µg/kg	5.1 U	4.5 U	91 U	54 U	54 U	75 U	46 U	47 U
Tetrachloroethene	µg/kg	5.1 U	4.5 U	91 U	54 U	54 U	75 U	46 U	47 U
Toluene	µg/kg	5.1 U	4.5 U	91 U	54 U	54 U	75 U	46 U	47 U
trans-1,2-Dichloroethene	µg/kg	5.1 U	4.5 U	91 U	54 U	54 U	75 U	46 U	47 U
trans-1,3-Dichloropropene	µg/kg	5.1 U	4.5 U	91 U	54 U	54 U	75 U	46 U	47 U
Trichloroethene	µg/kg	15	29	1100	790	650	410	500	880
Trichlorofluoromethane (CFC-11)	µg/kg	5.1 U	4.5 U	91 U	54 U	54 U	75 U	46 U	47 U
Trifluorotrichloroethane (CFC-113)	µg/kg	5.1 U	4.5 U	91 U	54 U	54 U	75 U	46 U	47 U
Vinyl chloride	µg/kg	5.1 U	4.5 U	91 U	54 U	54 U	75 U	46 U	47 U
Xylenes (total)	µg/kg	10 U	9.0 U	180 U	110 U	110 U	150 U	92 U	93 U
General Chemistry									
Fraction organic carbon (FOC)	%	-	-	-	-	-	-	-	-
Notes:									
J - Estimated concentration									
U - Not detected at the associated reporting limit									
UJ - Not detected; associated reporting limit is estimated									
R - Rejected									
ft bgs - Feet Below Ground Surface									
" - " Not applicable									
2700000	Exceeds Part 375 RUSCO-C criteria								
	Exceeds 1,000 ug/kg cleanup goal								
470	Exceeds Part 375 PoGW criteria								

Table 1

Analytical Results Summary - Soil
Pre-Design Investigation
1130 Niagara Street Site (C915284)
Buffalo, New York

Location ID: Sample Name: Sample Date: Depth:		MW-106 S-11219347-112020-AMC-197 11/20/2020 14-16 ft. bgs	MW-107 S-11219347-120120-AMC-218 12/01/2020 0.5-2 ft. bgs	MW-107 S-11219347-120120-AMC-219 12/01/2020 2-4 ft. bgs	MW-107 S-11219347-120120-AMC-220 12/01/2020 4-6 ft. bgs	MW-107 S-11219347-120120-AMC-221 12/01/2020 6-8 ft. bgs	MW-107 S-11219347-120120-AMC-222 12/01/2020 8-10 ft. bgs	MW-107 S-11219347-120120-AMC-223 12/01/2020 10-12 ft. bgs	MW-107 S-11219347-120120-AMC-224 12/01/2020 12-14 ft. bgs
Parameters	Unit								
Volatile Organic Compounds									
1,1,1-Trichloroethane	µg/kg	18	63	72	440	440	1900	1000	200 U
1,1,2,2-Tetrachloroethane	µg/kg	3.9 U	60 U	62 U	240 U	54 U	190 U	200 U	200 U
1,1,2-Trichloroethane	µg/kg	3.9 U	60 U	62 U	240 U	54 U	190 U	200 U	200 U
1,1-Dichloroethane	µg/kg	2.8 J	60 U	20 J	77 J	29 J	120 J	81 J	200 U
1,1-Dichloroethene	µg/kg	10	60 U	62 U	150 J	120	470	630	290
1,2,4-Trichlorobenzene	µg/kg	3.9 U	60 U	62 U	240 U	54 U	190 U	200 U	200 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	3.9 U	60 U	62 U	240 U	54 U	190 U	200 U	200 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	3.9 U	60 U	62 U	240 U	54 U	190 U	200 U	200 U
1,2-Dichlorobenzene	µg/kg	3.9 U	60 U	62 U	240 U	54 U	190 U	200 U	200 U
1,2-Dichloroethane	µg/kg	3.9 U	60 U	62 U	240 U	54 U	190 U	200 U	200 U
1,2-Dichloropropane	µg/kg	3.9 U	60 U	62 U	240 U	54 U	190 U	200 U	200 U
1,3-Dichlorobenzene	µg/kg	3.9 U	60 U	62 U	240 U	54 U	190 U	200 U	200 U
1,4-Dichlorobenzene	µg/kg	3.9 U	60 U	62 U	240 U	54 U	190 U	200 U	200 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	20 U	300 U	310 U	1200 U	270 U	950 U	990 U	980 U
2-Hexanone	µg/kg	20 U	300 U	310 U	1200 U	270 U	950 U	990 U	980 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	20 U	300 U	310 U	1200 U	270 U	950 U	990 U	980 U
Acetone	µg/kg	20 U	300 U	310 U	1200 U	270 U	950 U	990 U	980 U
Benzene	µg/kg	3.9 U	60 U	62 U	240 U	54 U	190 U	200 U	200 U
Bromodichloromethane	µg/kg	3.9 U	60 U	62 U	240 U	54 U	190 U	200 U	200 U
Bromoform	µg/kg	3.9 U	60 U	62 U	240 U	54 U	190 U	200 U	200 U
Bromomethane (Methyl bromide)	µg/kg	3.9 U	60 U	62 U	240 U	54 U	190 U	200 U	200 U
Carbon disulfide	µg/kg	3.9 U	60 U	62 U	240 U	54 U	190 U	200 U	200 U
Carbon tetrachloride	µg/kg	3.9 U	60 U	62 U	240 U	54 U	190 U	200 U	200 U
Chlorobenzene	µg/kg	3.9 U	60 U	62 U	240 U	54 U	190 U	200 U	200 U
Chloroethane	µg/kg	3.9 U	60 U	62 U	240 U	54 U	190 U	200 U	200 U
Chloroform (Trichloromethane)	µg/kg	0.39 J	60 U	62 U	240 U	54 U	190 U	200 U	200 U
Chloromethane (Methyl chloride)	µg/kg	3.9 U	60 U	62 U	240 U	54 U	190 U	200 U	200 U
cis-1,2-Dichloroethene	µg/kg	2.8 J	280	460	490	140	500	340	210
cis-1,3-Dichloropropene	µg/kg	3.9 U	60 U	62 U	240 U	54 U	190 U	200 U	200 U
Cyclohexane	µg/kg	3.9 U	60 U	62 U	240 U	54 U	190 U	200 U	200 U
Dibromochloromethane	µg/kg	3.9 U	60 U	62 U	240 U	54 U	190 U	200 U	200 U
Dichlorodifluoromethane (CFC-12)	µg/kg	3.9 U	60 U	62 U	240 U	54 U	190 U	200 U	200 U
Ethylbenzene	µg/kg	3.9 U	60 U	62 U	240 U	54 U	190 U	200 U	200 U
Isopropyl benzene	µg/kg	3.9 U	60 U	62 U	240 U	54 U	190 U	200 U	200 U
Methyl acetate	µg/kg	20 U	300 U	310 U	1200 U	270 U	950 U	990 U	980 U
Methyl cyclohexane	µg/kg	3.9 U	60 U	62 U	240 U	54 U	190 U	200 U	200 U
Methyl tert butyl ether (MTBE)	µg/kg	3.9 U	60 U	62 U	240 U	54 U	190 U	200 U	200 U
Methylene chloride	µg/kg	3.9 U	60 U	62 U	240 U	54 U	190 U	200 U	200 U
Styrene	µg/kg	3.9 U	60 U	62 U	240 U	54 U	190 U	200 U	200 U
Tetrachloroethene	µg/kg	3.9 U	60 U	23 J	240 U	54 U	190 U	200 U	200 U
Toluene	µg/kg	3.9 U	34 J	23 J	240 U	54 U	190 U	200 U	200 U
trans-1,2-Dichloroethene	µg/kg	3.9 U	60 U	62 U	240 U	54 U	190 U	200 U	200 U
trans-1,3-Dichloropropene	µg/kg	3.9 U	60 U	62 U	240 U	54 U	190 U	200 U	200 U
Trichloroethene	µg/kg	240 J	1700	2300	7700	2800	10000	9500	6300
Trichlorofluoromethane (CFC-11)	µg/kg	3.9 U	60 U	62 U	240 U	54 U	190 U	200 U	200 U
Trifluorotrichloroethane (CFC-113)	µg/kg	3.9 U	60 U	62 U	240 U	54 U	190 U	200 U	200 U
Vinyl chloride	µg/kg	3.9 U	60 U	62 U	240 U	54 U	190 U	200 U	200 U
Xylenes (total)	µg/kg	7.9 U	120 U	120 U	470 U	110 U	380 U	400 U	390 U
General Chemistry									
Fraction organic carbon (FOC)	%	-	-	-	-	-	-	0.4	-

Notes:

- J - Estimated concentration
- U - Not detected at the associated reporting limit
- UJ - Not detected; associated reporting limit is estimated
- R - Rejected
- ft bgs - Feet Below Ground Surface
- " - " Not applicable
- 2700000 Exceeds Part 375 RUSCO-C criteria
- Exceeds 1,000 ug/kg cleanup goal
- 470 Exceeds Part 375 PoGW criteria

Table 1

Analytical Results Summary - Soil
Pre-Design Investigation
1130 Niagara Street Site (C915284)
Buffalo, New York

Location ID:		MW-107	MW-108	MW-108	MW-108	MW-108	MW-108	MW-108	MW-108
Sample Name:		S-11219347-120120-AMC-225	S-11219347-120220-AMC-226	S-11219347-120220-AMC-227	S-11219347-120220-AMC-228	S-11219347-120220-AMC-229	S-11219347-120220-AMC-230	S-11219347-120220-AMC-231	S-11219347-120220-AMC-232
Sample Date:		12/01/2020	12/02/2020	12/02/2020	12/02/2020	12/02/2020	12/02/2020	12/02/2020	12/02/2020
Depth:		14-16.2 ft. bgs	0.5-2 ft. bgs	2-4 ft. bgs	4-6 ft. bgs	6-8 ft. bgs	8-10 ft. bgs	10-12 ft. bgs	12-14 ft. bgs
Parameters	Unit								
Volatile Organic Compounds									
1,1,1-Trichloroethane	µg/kg	680 U	110	19 J	640	270	91	120	49 J
1,1,2,2-Tetrachloroethane	µg/kg	680 U	63 U	66 U	130 U	56 U	59 U	52 U	53 U
1,1,2-Trichloroethane	µg/kg	680 U	63 U	66 U	130 U	56 U	59 U	52 U	53 U
1,1-Dichloroethane	µg/kg	680 U	63 U	66 U	100 J	56 U	59 U	52 U	53 U
1,1-Dichloroethene	µg/kg	680 U	63 U	66 U	100 J	56 U	59 U	52 U	53 U
1,2,4-Trichlorobenzene	µg/kg	680 U	63 U	66 U	130 U	56 U	59 U	52 U	53 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	680 U	63 U	66 U	130 U	56 U	59 U	52 U	53 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	680 U	63 U	66 U	130 U	56 U	59 U	52 U	53 U
1,2-Dichlorobenzene	µg/kg	680 U	63 U	66 U	130 U	56 U	59 U	52 U	53 U
1,2-Dichloroethane	µg/kg	680 U	63 U	66 U	130 U	56 U	59 U	52 U	53 U
1,2-Dichloropropane	µg/kg	680 U	63 U	66 U	130 U	56 U	59 U	52 U	53 U
1,3-Dichlorobenzene	µg/kg	680 U	63 U	66 U	130 U	56 U	59 U	52 U	53 U
1,4-Dichlorobenzene	µg/kg	680 U	63 U	66 U	130 U	56 U	59 U	52 U	53 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	3400 U	320 U	330 U	660 U	280 U	300 U	260 U	270 U
2-Hexanone	µg/kg	3400 U	320 U	330 U	660 U	280 U	300 U	260 U	270 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	3400 U	320 U	330 U	660 U	280 U	300 U	260 U	270 U
Acetone	µg/kg	3400 U	320 U	330 U	660 U	280 U	300 U	260 U	270 U
Benzene	µg/kg	680 U	63 U	66 U	130 U	56 U	59 U	52 U	53 U
Bromodichloromethane	µg/kg	680 U	63 U	66 U	130 U	56 U	59 U	52 U	53 U
Bromoform	µg/kg	680 U	63 U	66 U	130 U	56 U	59 U	52 U	53 U
Bromomethane (Methyl bromide)	µg/kg	680 U	63 U	66 U	130 U	56 U	59 U	52 U	53 U
Carbon disulfide	µg/kg	680 U	63 U	66 U	130 U	56 U	59 U	52 U	53 U
Carbon tetrachloride	µg/kg	680 U	63 U	66 U	130 U	56 U	59 U	52 U	53 U
Chlorobenzene	µg/kg	680 U	63 U	66 U	130 U	56 U	59 U	52 U	53 U
Chloroethane	µg/kg	680 U	63 U	66 U	130 U	56 U	59 U	52 U	53 U
Chloroform (Trichloromethane)	µg/kg	680 U	63 U	66 U	130 U	56 U	59 U	52 U	53 U
Chloromethane (Methyl chloride)	µg/kg	680 U	63 U	66 U	130 U	56 U	59 U	52 U	53 U
cis-1,2-Dichloroethene	µg/kg	680 U	63	66 U	330	56 U	59 U	52 U	53 U
cis-1,3-Dichloropropene	µg/kg	680 U	63 U	66 U	130 U	56 U	59 U	52 U	53 U
Cyclohexane	µg/kg	680 U	63 U	66 U	130 U	56 U	59 U	52 U	53 U
Dibromochloromethane	µg/kg	680 U	63 U	66 U	130 U	56 U	59 U	52 U	53 U
Dichlorodifluoromethane (CFC-12)	µg/kg	680 U	63 U	66 U	130 U	56 U	59 U	52 U	53 U
Ethylbenzene	µg/kg	680 U	63 U	66 U	130 U	56 U	59 U	52 U	53 U
Isopropyl benzene	µg/kg	680 U	63 U	66 U	130 U	56 U	59 U	52 U	53 U
Methyl acetate	µg/kg	3400 U	320 U	330 U	660 U	280 U	300 U	260 U	270 U
Methyl cyclohexane	µg/kg	680 U	40 J	66 U	81 J	56 U	59 U	52 U	53 U
Methyl tert butyl ether (MTBE)	µg/kg	680 U	63 U	66 U	130 U	56 U	59 U	52 U	53 U
Methylene chloride	µg/kg	680 U	63 U	66 U	130 U	56 U	59 U	52 U	53 U
Styrene	µg/kg	680 U	63 U	66 U	130 U	56 U	59 U	52 U	53 U
Tetrachloroethene	µg/kg	680 U	63 U	66 U	130 U	56 U	59 U	52 U	53 U
Toluene	µg/kg	680 U	67	66 U	130 U	56 U	59 U	52 U	53 U
trans-1,2-Dichloroethene	µg/kg	680 U	63 U	66 U	130 U	56 U	59 U	52 U	53 U
trans-1,3-Dichloropropene	µg/kg	680 U	63 U	66 U	130 U	56 U	59 U	52 U	53 U
Trichloroethene	µg/kg	24000	1500	300	6200	1500	470	1000	250
Trichlorofluoromethane (CFC-11)	µg/kg	680 U	63 U	66 U	130 U	56 U	59 U	52 U	53 U
Trifluorotrichloroethane (CFC-113)	µg/kg	680 U	63 U	66 U	130 U	56 U	59 U	52 U	53 U
Vinyl chloride	µg/kg	680 U	63 U	66 U	130 U	56 U	59 U	52 U	53 U
Xylenes (total)	µg/kg	1400 U	37 J	130 U	270 U	110 U	120 U	100 U	110 U
General Chemistry									
Fraction organic carbon (FOC)	%	-	-	-	-	-	-	-	-

Notes:

- J - Estimated concentration
- U - Not detected at the associated reporting limit
- UJ - Not detected; associated reporting limit is estimated
- R - Rejected
- ft bgs - Feet Below Ground Surface
- " - " Not applicable
- 2700000

Exceeds Part 375 RUSCO-C criteria
- Exceeds 1,000 ug/kg cleanup goal
- 470

Exceeds Part 375 PoGW criteria

Table 1

Analytical Results Summary - Soil
Pre-Design Investigation
1130 Niagara Street Site (C915284)
Buffalo, New York

Location ID:		MW-108	MW-109	MW-109	MW-109	MW-109	MW-109	MW-110	MW-110
Sample Name:		S-11219347-120220-AMC-233	S-11219347-112520-AMC-209	S-11219347-112520-AMC-210	S-11219347-112520-AMC-211	S-11219347-112520-AMC-212	S-11219347-112520-AMC-208	S-11219347-113020-AMC-216	S-11219347-113020-AMC-217
Sample Date:		12/02/2020	11/25/2020	11/25/2020	11/25/2020	11/25/2020	11/25/2020	11/30/2020	11/30/2020
Depth:		14-15.9 ft. bgs	2-4 ft. bgs	6-8 ft. bgs	8-10 ft. bgs	10-10.7 ft. bgs	0-2 ft. bgs	2-4 ft. bgs	4-6 ft. bgs
Parameters	Unit								
Volatile Organic Compounds									
1,1,1-Trichloroethane	µg/kg	50 J	5600	54000	110000	110000	670	860	530
1,1,2,2-Tetrachloroethane	µg/kg	54 U	290 U	2000 U	4800 U	1100 U	64 U	67 U	65 U
1,1,2-Trichloroethane	µg/kg	54 U	290 U	2000 U	4800 U	1100 U	64 U	67 U	65 U
1,1-Dichloroethane	µg/kg	54 U	290 U	2000 U	4800 U	1100 U	64 U	120	100
1,1-Dichloroethene	µg/kg	54 U	240 J	19000	25000	19000	39 J	74	65 U
1,2,4-Trichlorobenzene	µg/kg	54 U	290 U	2000 U	4800 U	1100 U	64 U	67 U	65 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	54 U	290 U	2000 U	4800 U	1100 U	64 U	67 U	65 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	54 U	290 U	2000 U	4800 U	1100 U	64 U	67 U	65 U
1,2-Dichlorobenzene	µg/kg	54 U	290 U	2000 U	4800 U	1100 U	64 U	67 U	65 U
1,2-Dichloroethane	µg/kg	54 U	290 U	2000 U	4800 U	1100 U	64 U	67 U	65 U
1,2-Dichloropropane	µg/kg	54 U	290 U	2000 U	4800 U	1100 U	64 U	67 U	65 U
1,3-Dichlorobenzene	µg/kg	54 U	290 U	2000 U	4800 U	1100 U	64 U	67 U	65 U
1,4-Dichlorobenzene	µg/kg	54 U	290 U	2000 U	4800 U	1100 U	64 U	67 U	65 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	270 U	1500 U	10000 U	24000 U	5700 U	320 U	340 U	330 U
2-Hexanone	µg/kg	270 U	1500 U	10000 U	24000 U	5700 U	320 U	340 U	330 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	270 U	1500 U	10000 U	24000 U	5700 U	320 U	340 U	330 U
Acetone	µg/kg	270 U	1500 U	10000 U	24000 U	5700 U	320 U	340 U	330 U
Benzene	µg/kg	54 U	290 U	2000 U	4800 U	1100 U	64 U	67 U	65 U
Bromodichloromethane	µg/kg	54 U	290 U	2000 U	4800 U	1100 U	64 U	67 U	65 U
Bromoform	µg/kg	54 U	290 U	2000 U	4800 U	1100 U	64 U	67 U	65 U
Bromomethane (Methyl bromide)	µg/kg	54 U	290 U	2000 U	4800 U	1100 U	64 U	67 U	65 U
Carbon disulfide	µg/kg	54 U	290 U	2000 U	4800 U	1100 U	64 U	67 U	65 U
Carbon tetrachloride	µg/kg	54 U	290 U	2000 U	4800 U	1100 U	64 U	67 U	65 U
Chlorobenzene	µg/kg	54 U	290 U	2000 U	4800 U	1100 U	64 U	67 U	65 U
Chloroethane	µg/kg	54 U	290 U	2000 U	4800 U	1100 U	64 U	67 U	65 U
Chloroform (Trichloromethane)	µg/kg	54 U	290 U	2000 U	4800 U	1100 U	64 U	67 U	65 U
Chloromethane (Methyl chloride)	µg/kg	54 U	290 U	2000 U	4800 U	1100 U	64 U	67 U	65 U
cis-1,2-Dichloroethene	µg/kg	54 U	520	2000 U	4800 U	1100 U	110	1000	2200
cis-1,3-Dichloropropene	µg/kg	54 U	290 U	2000 U	4800 U	1100 U	64 U	67 U	65 U
Cyclohexane	µg/kg	54 U	290 U	2000 U	4800 U	1100 U	64 U	67 U	65 U
Dibromochloromethane	µg/kg	54 U	290 U	2000 U	4800 U	1100 U	64 U	67 U	65 U
Dichlorodifluoromethane (CFC-12)	µg/kg	54 U	290 U	2000 U	4800 U	1100 U	64 U	67 U	65 U
Ethylbenzene	µg/kg	54 U	290 U	2000 U	4800 U	880 J	64 U	67 U	65 U
Isopropyl benzene	µg/kg	54 U	290 U	2000 U	4800 U	540 J	64 U	67 U	65 U
Methyl acetate	µg/kg	270 U	3400	10000 U	24000 U	5700 U	320 U	340 U	330 U
Methyl cyclohexane	µg/kg	54 U	290 U	2000 U	4800 U	1100 U	36 J	67 U	65 U
Methyl tert butyl ether (MTBE)	µg/kg	54 U	290 U	2000 U	4800 U	1100 U	64 U	67 U	65 U
Methylene chloride	µg/kg	54 U	290 U	2000 U	4800 U	1100 U	64 U	67 U	65 U
Styrene	µg/kg	54 U	290 U	2000 U	4800 U	1100 U	64 U	67 U	65 U
Tetrachloroethene	µg/kg	54 U	290 U	2000 U	4800 U	1100 U	64 U	67 U	65 U
Toluene	µg/kg	54 U	290 U	2000 U	4800 U	560 J	64 U	67 U	65 U
trans-1,2-Dichloroethene	µg/kg	54 U	290 U	2000 U	4800 U	1100 U	64 U	24 J	39 J
trans-1,3-Dichloropropene	µg/kg	54 U	290 U	2000 U	4800 U	1100 U	64 U	67 U	65 U
Trichloroethene	µg/kg	310	19000	60000	91000	78000	5400	3300	3100
Trichlorofluoromethane (CFC-11)	µg/kg	54 U	290 U	2000 U	4800 U	1100 U	64 U	67 U	65 U
Trifluorotrichloroethane (CFC-113)	µg/kg	54 U	290 U	2000 U	4800 U	1100 U	64 U	67 U	65 U
Vinyl chloride	µg/kg	54 U	290 U	2000 U	4800 U	1100 U	64 U	67 U	65 U
Xylenes (total)	µg/kg	110 U	590 U	4000 U	9500 U	3500	130 U	130 U	130 U
General Chemistry									
Fraction organic carbon (FOC)	%	-	-	-	-	-	-	-	-

Notes:

- J - Estimated concentration
- U - Not detected at the associated reporting limit
- UJ - Not detected; associated reporting limit is estimated
- R - Rejected
- ft bgs - Feet Below Ground Surface
- " - " Not applicable
- 2700000 Exceeds Part 375 RUSCO-C criteria
- Exceeds 1,000 ug/kg cleanup goal
- 470 Exceeds Part 375 PoGW criteria

Table 1

Analytical Results Summary - Soil
Pre-Design Investigation
1130 Niagara Street Site (C915284)
Buffalo, New York

	Location ID:	MW-110
	Sample Name:	S-11219347-113020-AMC-215
	Sample Date:	11/30/2020
	Depth:	0-2 ft. bgs
Parameters	Unit	
Volatile Organic Compounds		
1,1,1-Trichloroethane	µg/kg	680
1,1,2,2-Tetrachloroethane	µg/kg	59 U
1,1,2-Trichloroethane	µg/kg	59 U
1,1-Dichloroethane	µg/kg	29 J
1,1-Dichloroethene	µg/kg	59 U
1,2,4-Trichlorobenzene	µg/kg	59 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	59 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	59 U
1,2-Dichlorobenzene	µg/kg	59 U
1,2-Dichloroethane	µg/kg	59 U
1,2-Dichloropropane	µg/kg	59 U
1,3-Dichlorobenzene	µg/kg	59 U
1,4-Dichlorobenzene	µg/kg	59 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	300 U
2-Hexanone	µg/kg	300 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	300 U
Acetone	µg/kg	300 U
Benzene	µg/kg	59 U
Bromodichloromethane	µg/kg	59 U
Bromoform	µg/kg	59 U
Bromomethane (Methyl bromide)	µg/kg	59 U
Carbon disulfide	µg/kg	59 U
Carbon tetrachloride	µg/kg	59 U
Chlorobenzene	µg/kg	59 U
Chloroethane	µg/kg	59 U
Chloroform (Trichloromethane)	µg/kg	59 U
Chloromethane (Methyl chloride)	µg/kg	59 U
cis-1,2-Dichloroethene	µg/kg	170
cis-1,3-Dichloropropene	µg/kg	59 U
Cyclohexane	µg/kg	59 U
Dibromochloromethane	µg/kg	59 U
Dichlorodifluoromethane (CFC-12)	µg/kg	59 U
Ethylbenzene	µg/kg	59 U
Isopropyl benzene	µg/kg	59 U
Methyl acetate	µg/kg	130 J
Methyl cyclohexane	µg/kg	59 U
Methyl tert butyl ether (MTBE)	µg/kg	59 U
Methylene chloride	µg/kg	59 U
Styrene	µg/kg	59 U
Tetrachloroethene	µg/kg	59 U
Toluene	µg/kg	19 J
trans-1,2-Dichloroethene	µg/kg	59 U
trans-1,3-Dichloropropene	µg/kg	59 U
Trichloroethene	µg/kg	2500
Trichlorofluoromethane (CFC-11)	µg/kg	59 U
Trifluorotrichloroethane (CFC-113)	µg/kg	59 U
Vinyl chloride	µg/kg	59 U
Xylenes (total)	µg/kg	120 U
General Chemistry		
Fraction organic carbon (FOC)	%	-

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit
UJ - Not detected; associated reporting limit is estimated
R - Rejected
ft bgs - Feet Below Ground Surface
" - " Not applicable

2700000	Exceeds Part 375 RUSCO-C criteria
	Exceeds 1,000 ug/kg cleanup goal
470	Exceeds Part 375 PoGW criteria

Table 2
Analytical Results Summary - Overburden Groundwater
Pre-Design Investigation
1130 Niagara Street Site (C915284)
Buffalo, New York

Location ID:		GP-C-1		GP-1-1		GP-7-1		GP-8-1		GP-8-1		GP-14-1	
Sample Name:		WG-11219347-111720-AMC-167		WG-11219347-111220-AMC-098		WG-11219347-111320-AMC-128		WG-11219347-111620-AMC-152		WG-11219347-111620-AMC-153		WG-11219347-111720-AMC-168	
Sample Date:		11/17/2020		11/12/2020		11/13/2020		11/16/2020		11/16/2020		11/17/2020	
		NYSDEC TOGs								Duplicate			
		Groundwater											
		Guidance Value		Standard									
Parameters	Unit												
Volatile Organic Compounds													
1,1,1-Trichloroethane	µg/L	NC	5		39000	6700	6700	2200	1900	2100			
1,1,2,2-Tetrachloroethane	µg/L	NC	5		2000 U	400 U	1000 U	200 U	200 U	1000 U			
1,1,2-Trichloroethane	µg/L	NC	1		2000 U	400 U	1000 U	200 U	200 U	1000 U			
1,1-Dichloroethane	µg/L	NC	5		760 J	400 U	1000 U	180 J	150 J	1000 U			
1,1-Dichloroethene	µg/L	NC	5		15000	1700	1000 U	1200	960	980 J			
1,2,4-Trichlorobenzene	µg/L	NC	5		2000 U	400 U	1000 U	200 U	200 U	1000 U			
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	NC	0.04		2000 U	400 U	1000 U	200 U	200 U	1000 U			
1,2-Dibromoethane (Ethylene dibromide)	µg/L	NC	0.0006		2000 U	400 U	1000 U	200 U	200 U	1000 U			
1,2-Dichlorobenzene	µg/L	NC	3		2000 U	400 U	1000 U	200 U	200 U	1000 U			
1,2-Dichloroethane	µg/L	NC	0.6		2000 U	400 U	1000 U	200 U	200 U	1000 U			
1,2-Dichloropropane	µg/L	NC	1		2000 U	400 U	1000 U	200 U	200 U	1000 U			
1,3-Dichlorobenzene	µg/L	NC	3		2000 U	400 U	1000 U	200 U	200 U	1000 U			
1,4-Dichlorobenzene	µg/L	NC	3		2000 U	400 U	1000 U	200 U	200 U	1000 U			
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	50	NC		20000 U	4000 U	10000 U	2000 U	2000 U	10000 U			
2-Hexanone	µg/L	50	NC		10000 U	2000 U	5000 U	1000 U	1000 U	5000 U			
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	NC	NC		10000 U	2000 U	5000 U	1000 U	1000 U	5000 U			
Acetone	µg/L	50	NC		20000 U	4000 U	10000 U	2000 U	2000 U	10000 U			
Benzene	µg/L	NC	1		2000 U	400 U	1000 U	200 U	200 U	1000 U			
Bromodichloromethane	µg/L	50	NC		2000 U	400 U	1000 U	200 U	200 U	1000 U			
Bromoform	µg/L	50	NC		2000 U	400 U	1000 U	200 U	200 U	1000 U			
Bromomethane (Methyl bromide)	µg/L	NC	5		2000 U	400 U	1000 U	200 U	200 U	1000 U			
Carbon disulfide	µg/L	60	60		1800 J	400 U	1000 U	200 U	200 U	540 J			
Carbon tetrachloride	µg/L	NC	5		2000 U	400 U	1000 U	200 U	200 U	1000 U			
Chlorobenzene	µg/L	NC	5		2000 U	400 U	1000 U	200 U	200 U	1000 U			
Chloroethane	µg/L	NC	5		2000 U	400 U	1000 U	200 U	200 U	1000 U			
Chloroform (Trichloromethane)	µg/L	NC	7		2000 U	400 U	1000 U	200 U	200 U	1000 U			
Chloromethane (Methyl chloride)	µg/L	NC	5		2000 U	400 U	1000 U	200 U	200 U	1000 U			
cis-1,2-Dichloroethene	µg/L	NC	5		2000 U	510	1000 U	600	510	1000 U			
cis-1,3-Dichloropropene	µg/L	NC	NC		2000 U	400 U	1000 U	200 U	200 U	1000 U			
Cyclohexane	µg/L	NC	NC		2000 U	400 U	1000 U	200 U	200 U	1000 U			
Dibromochloromethane	µg/L	50	NC		2000 U	400 U	1000 U	200 U	200 U	1000 U			
Dichlorodifluoromethane (CFC-12)	µg/L	NC	5		2000 U	400 U	1000 U	200 U	200 U	1000 U			
Ethylbenzene	µg/L	NC	5		2000 U	400 U	1000 U	200 U	200 U	1000 U			
Isopropyl benzene	µg/L	NC	5		2000 U	400 U	1000 U	200 U	200 U	1000 U			
Methyl acetate	µg/L	NC	NC		5000 U	1000 U	2500 U	500 U	500 U	2500 U			
Methyl cyclohexane	µg/L	NC	NC		2000 U	400 U	1000 U	200 U	200 U	1000 U			
Methyl tert butyl ether (MTBE)	µg/L	10	NC		2000 U	400 U	1000 U	200 U	200 U	1000 U			
Methylene chloride	µg/L	NC	5		2000 U	400 U	1000 U	200 U	200 U	1000 U			
Styrene	µg/L	NC	5		2000 U	400 U	1000 U	200 U	200 U	1000 U			
Tetrachloroethene	µg/L	NC	5		2000 U	400 U	1000 U	200 U	200 U	1000 U			
Toluene	µg/L	NC	5		2000 U	400 U	1000 U	200 U	200 U	1000 U			
trans-1,2-Dichloroethene	µg/L	NC	5		2000 U	400 U	1000 U	200 U	200 U	1000 U			
trans-1,3-Dichloropropene	µg/L	NC	NC		2000 U	400 U	1000 U	200 U	200 U	1000 U			
Trichloroethene	µg/L	NC	5		190000	33000	65000	11000	9100	45000			
Trichlorofluoromethane (CFC-11)	µg/L	NC	5		2000 U	400 U	1000 U	200 U	200 U	1000 U			
Trifluorotrichloroethane (CFC-113)	µg/L	NC	5		2000 U	400 U	1000 U	200 U	200 U	1000 U			
Vinyl chloride	µg/L	NC	2		2000 U	400 U	1000 U	200 U	200 U	1000 U			
Xylenes (total)	µg/L	NC	5		4000 U	800 U	2000 U	400 U	400 U	2000 U			

Notes:

J - Estimated concentration

U - Not detected at the associated reporting limit

UJ - Not detected; associated reporting limit is estimated

27 Exceeds NYSDEC TOGs Groundwater Standard

Table 2
Analytical Results Summary - Overburden Groundwater
Pre-Design Investigation
1130 Niagara Street Site (C915284)
Buffalo, New York

Location ID: Sample Name: Sample Date:		GP-19-1 WG-11219347-111720-AMC-155 11/17/2020	GP-23-1 WG-11219347-111720-AMC-175 11/17/2020	GP-24-1 WG-11219347-111220-AMC-089 11/12/2020	GP-30-1 WG-11219347-111120-AMC-077 11/11/2020	GP-30-1 WG-11219347-111120-AMC-078 11/11/2020 Duplicate	GP-31-1 WG-11219347-111120-AMC-049 11/11/2020	GP-33-1 WG-11219347-111120-AMC-071 11/11/2020
Parameters	Unit							
Volatile Organic Compounds								
1,1,1-Trichloroethane	µg/L	2000 U	140	400 U	23	23	4.0 U	170
1,1,2,2-Tetrachloroethane	µg/L	2000 U	40 U	400 U	5.0 U	5.0 U	4.0 U	50 U
1,1,2-Trichloroethane	µg/L	2000 U	40 U	400 U	5.0 U	5.0 U	4.0 U	50 U
1,1-Dichloroethane	µg/L	2000 U	65	400 U	9.8	9.3	3.5 J	140
1,1-Dichloroethene	µg/L	1700 J	180	580	23	22	4.0 U	250
1,2,4-Trichlorobenzene	µg/L	2000 U	40 U	400 U	5.0 U	5.0 U	4.0 U	50 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	2000 U	40 U	400 U	5.0 U	5.0 U	4.0 U	50 U
1,2-Dibromoethane (Ethylene dibromide)	µg/L	2000 U	40 U	400 U	5.0 U	5.0 U	4.0 U	50 U
1,2-Dichlorobenzene	µg/L	2000 U	40 U	400 U	5.0 U	5.0 U	4.0 U	50 U
1,2-Dichloroethane	µg/L	2000 U	40 U	400 U	5.0 U	5.0 U	4.0 U	50 U
1,2-Dichloropropane	µg/L	2000 U	40 U	400 U	5.0 U	5.0 U	4.0 U	50 U
1,3-Dichlorobenzene	µg/L	2000 U	40 U	400 U	5.0 U	5.0 U	4.0 U	50 U
1,4-Dichlorobenzene	µg/L	2000 U	40 U	400 U	5.0 U	5.0 U	4.0 U	50 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	20000 U	400 U	4000 U	50 U	50 U	40 U	500 U
2-Hexanone	µg/L	10000 U	200 U	2000 U	25 U	25 U	20 U	250 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	10000 U	200 U	2000 U	25 U	25 U	20 U	250 U
Acetone	µg/L	20000 U	400 U	4000 U	50 U	50 U	40 U	500 U
Benzene	µg/L	2000 U	40 U	400 U	5.0 U	5.0 U	4.0 U	50 U
Bromodichloromethane	µg/L	2000 U	40 U	400 U	5.0 U	5.0 U	4.0 U	50 U
Bromoform	µg/L	2000 U	40 U	400 U	5.0 U	5.0 U	4.0 U	50 U
Bromomethane (Methyl bromide)	µg/L	2000 U	40 U	400 U	5.0 U	5.0 U	4.0 U	50 U
Carbon disulfide	µg/L	2000 U	22 J	400 U	5.0 U	5.0 U	4.0 U	50 U
Carbon tetrachloride	µg/L	2000 U	40 U	400 U	5.0 U	5.0 U	4.0 U	50 U
Chlorobenzene	µg/L	2000 U	40 U	400 U	5.0 U	5.0 U	4.0 U	50 U
Chloroethane	µg/L	2000 U	40 U	400 U	5.0 U	5.0 U	4.0 U	50 U
Chloroform (Trichloromethane)	µg/L	2000 U	40 U	400 U	5.0 U	5.0 U	4.0 U	50 U
Chloromethane (Methyl chloride)	µg/L	2000 U	40 U	400 U	5.0 U	5.0 U	4.0 U	50 U
cis-1,2-Dichloroethene	µg/L	2000 U	52	500	11	8.9	11	360
cis-1,3-Dichloropropene	µg/L	2000 U	40 U	400 U	5.0 U	5.0 U	4.0 U	50 U
Cyclohexane	µg/L	2000 U	40 U	400 U	5.0 U	5.0 U	4.0 U	50 U
Dibromochloromethane	µg/L	2000 U	40 U	400 U	5.0 U	5.0 U	4.0 U	50 U
Dichlorodifluoromethane (CFC-12)	µg/L	2000 U	40 U	400 U	5.0 U	5.0 U	4.0 U	50 U
Ethylbenzene	µg/L	2000 U	40 U	400 U	5.0 U	5.0 U	4.0 U	50 U
Isopropyl benzene	µg/L	2000 U	40 U	400 U	5.0 U	5.0 U	4.0 U	50 U
Methyl acetate	µg/L	5000 U	100 U	1000 U	13 U	13 U	10 U	130 U
Methyl cyclohexane	µg/L	2000 U	40 U	400 U	5.0 U	5.0 U	4.0 U	50 U
Methyl tert butyl ether (MTBE)	µg/L	2000 UJ	40 U	400 U	5.0 U	5.0 U	4.0 U	50 UJ
Methylene chloride	µg/L	2000 U	40 U	400 U	5.0 U	5.0 U	4.0 U	50 U
Styrene	µg/L	2000 U	40 U	400 U	5.0 U	5.0 U	4.0 U	50 U
Tetrachloroethene	µg/L	2000 U	40 U	400 U	5.0 U	5.0 U	4.0 U	50 U
Toluene	µg/L	2000 U	40 U	400 U	5.0 U	5.0 U	4.0 U	50 U
trans-1,2-Dichloroethene	µg/L	2000 U	40 U	400 U	5.0 U	5.0 U	4.0 U	50 U
trans-1,3-Dichloropropene	µg/L	2000 U	40 U	400 U	5.0 U	5.0 U	4.0 U	50 U
Trichloroethene	µg/L	52000 J	2000	16000	320	330	33	2700 J
Trichlorofluoromethane (CFC-11)	µg/L	2000 U	40 U	400 U	5.0 U	5.0 U	4.0 U	50 U
Trifluorotrichloroethane (CFC-113)	µg/L	2000 U	40 U	400 U	5.0 U	5.0 U	4.0 U	50 U
Vinyl chloride	µg/L	2000 U	40 U	400 U	5.0 U	5.0 U	4.0 U	50 U
Xylenes (total)	µg/L	4000 U	80 U	800 U	10 U	10 U	8.0 U	100 U

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit
UJ - Not detected; associated reporting limit is estimated

27 Exceeds NYSDEC TOGs Groundwater Standard

Table 2
Analytical Results Summary - Overburden Groundwater
Pre-Design Investigation
1130 Niagara Street Site (C915284)
Buffalo, New York

Location ID:		GP-35-1	GP-36	GP-37	GP-38	GP-39	GP-40	GP-44
Sample Name:		WG-11219347-111220-AMC-099	WG-11219347-111720-AMC-176	WG-11219347-111820-AMC-178	WG-11219347-111320-AMC-115	WG-11219347-111320-AMC-124	WG-11219347-111120-AMC-050	WG-11219347-111720-AMC-154
Sample Date:		11/12/2020	11/17/2020	11/18/2020	11/13/2020	11/13/2020	11/11/2020	11/17/2020
Parameters	Unit							
Volatile Organic Compounds								
1,1,1-Trichloroethane	µg/L	1.8	10 U	4.3 J	32	110	5.6	160
1,1,2,2-Tetrachloroethane	µg/L	1.0 U	10 U	5.0 U	20 U	20 U	2.0 U	20 U
1,1,2-Trichloroethane	µg/L	1.0 U	10 U	5.0 U	20 U	20 U	2.0 U	20 U
1,1-Dichloroethane	µg/L	2.0	13	6.9	120	12 J	2.5	14 J
1,1-Dichloroethene	µg/L	1.3	27	5.8	100	36	15	44
1,2,4-Trichlorobenzene	µg/L	1.0 U	10 U	5.0 U	20 U	20 U	2.0 U	20 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	1.0 U	10 U	5.0 U	20 U	20 U	2.0 U	20 U
1,2-Dibromoethane (Ethylene dibromide)	µg/L	1.0 U	10 U	5.0 U	20 U	20 U	2.0 U	20 U
1,2-Dichlorobenzene	µg/L	1.0 U	10 U	5.0 U	20 U	20 U	2.0 U	20 U
1,2-Dichloroethane	µg/L	1.0 U	10 U	5.0 U	20 U	20 U	2.0 U	20 U
1,2-Dichloropropane	µg/L	1.0 U	10 U	5.0 U	20 U	20 U	2.0 U	20 U
1,3-Dichlorobenzene	µg/L	1.0 U	10 U	5.0 U	20 U	20 U	2.0 U	20 U
1,4-Dichlorobenzene	µg/L	1.0 U	10 U	5.0 U	20 U	20 U	2.0 U	20 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	2.9 J	100 U	50 U	200 U	200 U	20 U	200 U
2-Hexanone	µg/L	5.0 U	50 U	25 U	100 U	100 U	10 U	100 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	5.0 U	50 U	25 U	100 U	100 U	10 U	100 U
Acetone	µg/L	15	100 U	50 U	200 U	200 U	11 J	200 U
Benzene	µg/L	1.0 U	10 U	5.0 U	20 U	20 U	2.0 U	20 U
Bromodichloromethane	µg/L	1.0 U	10 U	5.0 U	20 U	20 U	2.0 U	20 U
Bromoform	µg/L	1.0 U	10 U	5.0 U	20 U	20 U	2.0 U	20 U
Bromomethane (Methyl bromide)	µg/L	1.0 U	10 U	5.0 U	20 U	20 U	2.0 U	20 U
Carbon disulfide	µg/L	1.0 U	4.9 J	5.0 U	20 U	20 U	2.0 U	12 J
Carbon tetrachloride	µg/L	1.0 U	10 U	5.0 U	20 U	20 U	2.0 U	20 U
Chlorobenzene	µg/L	1.0 U	10 U	5.0 U	20 U	20 U	2.0 U	20 U
Chloroethane	µg/L	1.0 U	10 U	5.0 U	20 U	20 U	2.0 U	20 U
Chloroform (Trichloromethane)	µg/L	1.0 U	10 U	5.0 U	20 U	20 U	2.0 U	20 U
Chloromethane (Methyl chloride)	µg/L	1.0 U	10 U	5.0 U	20 U	20 U	2.0 U	20 U
cis-1,2-Dichloroethene	µg/L	8.1	17	8.0	1300	23	7.6	52
cis-1,3-Dichloropropene	µg/L	1.0 U	10 U	5.0 U	20 U	20 U	2.0 U	20 U
Cyclohexane	µg/L	1.0 U	10 U	5.0 U	20 U	20 U	2.0 U	20 U
Dibromochloromethane	µg/L	1.0 U	10 U	5.0 U	20 U	20 U	2.0 U	20 U
Dichlorodifluoromethane (CFC-12)	µg/L	1.0 U	10 U	5.0 U	20 U	20 U	2.0 U	20 U
Ethylbenzene	µg/L	1.0 U	10 U	5.0 U	20 U	20 U	2.0 U	20 U
Isopropyl benzene	µg/L	1.0 U	10 U	5.0 U	20 U	20 U	2.0 U	20 U
Methyl acetate	µg/L	2.5 U	25 U	13 U	50 U	50 U	5.0 U	50 U
Methyl cyclohexane	µg/L	1.0 U	10 U	5.0 U	20 U	20 U	2.0 U	20 U
Methyl tert butyl ether (MTBE)	µg/L	1.0 U	10 U	5.0 UJ	20 U	20 U	2.0 U	20 U
Methylene chloride	µg/L	1.0 U	10 U	5.0 U	20 U	20 U	2.0 U	20 U
Styrene	µg/L	1.0 U	10 U	5.0 U	20 U	20 U	2.0 U	20 U
Tetrachloroethene	µg/L	1.0 U	10 U	5.0 U	20 U	20 U	2.0 U	20 U
Toluene	µg/L	1.0 U	10 U	5.0 U	20 U	20 U	25	20 U
trans-1,2-Dichloroethene	µg/L	1.0 U	10 U	5.0 U	20 U	20 U	2.0 U	20 U
trans-1,3-Dichloropropene	µg/L	1.0 U	10 U	5.0 U	20 U	20 U	2.0 U	20 U
Trichloroethene	µg/L	24	320	110	790	930	74	580
Trichlorofluoromethane (CFC-11)	µg/L	1.0 U	10 U	5.0 U	20 U	20 U	2.0 U	20 U
Trifluorotrichloroethane (CFC-113)	µg/L	1.0 U	10 U	5.0 U	20 U	20 U	2.0 U	20 U
Vinyl chloride	µg/L	1.0 U	10 U	5.0 U	20 U	20 U	2.0 U	20 U
Xylenes (total)	µg/L	2.0 U	20 U	10 U	40 U	40 U	4.0 U	40 U

Notes:

- J - Estimated concentration
- U - Not detected at the associated reporting limit
- UJ - Not detected; associated reporting limit is estimated

27

Exceeds NYSDEC TOGs Groundwater Standard

Table 2
Analytical Results Summary - Overburden Groundwater
Pre-Design Investigation
1130 Niagara Street Site (C915284)
Buffalo, New York

Location ID:	GP-45	GP-48	GP-49	GP-50	GP-51	GP-52	GP-53	
Sample Name:	WG-11219347-111020-AMC-041	WG-11219347-111320-AMC-125	WG-11219347-112520-AMC-214	WG-11219347-111220-AMC-088	WG-11219347-111020-AMC-040	WG-11219347-111220-AMC-087	WG-11219347-111320-AMC-126	
Sample Date:	11/10/2020	11/13/2020	11/25/2020	11/12/2020	11/10/2020	11/12/2020	11/13/2020	
Parameters	Unit							
Volatile Organic Compounds								
1,1,1-Trichloroethane	µg/L	60	4100	4.0 U	21	10	10 U	4.0 U
1,1,2,2-Tetrachloroethane	µg/L	2.0 U	50 U	4.0 U	4.0 U	8.0 U	10 U	4.0 U
1,1,2-Trichloroethane	µg/L	2.0 U	50 U	4.0 U	4.0 U	8.0 U	10 U	4.0 U
1,1-Dichloroethane	µg/L	21	88	4.0 U	3.1 J	8.0 U	10 U	12
1,1-Dichloroethene	µg/L	150	470	4.0 U	4.0 U	3.5 J	10 U	4.0 U
1,2,4-Trichlorobenzene	µg/L	2.0 U	50 U	4.0 U	4.0 U	8.0 U	10 U	4.0 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	2.0 U	50 U	4.0 U	4.0 U	8.0 U	10 U	4.0 U
1,2-Dibromoethane (Ethylene dibromide)	µg/L	2.0 U	50 U	4.0 U	4.0 U	8.0 U	10 U	4.0 U
1,2-Dichlorobenzene	µg/L	2.0 U	50 U	4.0 U	4.0 U	8.0 U	10 U	4.0 U
1,2-Dichloroethane	µg/L	2.0 U	50 U	4.0 U	4.0 U	8.0 U	10 U	2.5 J
1,2-Dichloropropane	µg/L	2.0 U	50 U	4.0 U	4.0 U	8.0 U	10 U	4.0 U
1,3-Dichlorobenzene	µg/L	2.0 U	50 U	4.0 U	4.0 U	8.0 U	10 U	4.0 U
1,4-Dichlorobenzene	µg/L	2.0 U	50 U	4.0 U	4.0 U	8.0 U	10 U	4.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	20 U	500 U	40 U	40 U	80 U	14 J	40 U
2-Hexanone	µg/L	10 U	250 U	20 U	20 U	40 U	50 U	20 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	10 U	250 U	20 U	20 U	40 U	50 U	20 U
Acetone	µg/L	20 U	500 U	25 J	15 J	80 U	37 J	19 J
Benzene	µg/L	1.4 J	50 U	4.0 U	4.0 U	8.0 U	10 U	4.0 U
Bromodichloromethane	µg/L	2.0 U	50 U	4.0 U	4.0 U	8.0 U	10 U	4.0 U
Bromoform	µg/L	2.0 U	50 U	4.0 U	4.0 U	8.0 U	10 U	4.0 U
Bromomethane (Methyl bromide)	µg/L	2.0 U	50 U	4.0 U	4.0 U	8.0 U	10 U	4.0 U
Carbon disulfide	µg/L	2.0 U	50 U	4.0 U	4.0 U	8.0 U	10 U	4.0 U
Carbon tetrachloride	µg/L	2.0 U	50 U	4.0 U	4.0 U	8.0 U	10 U	4.0 U
Chlorobenzene	µg/L	2.0 U	50 U	4.0 U	4.0 U	8.0 U	10 U	4.0 U
Chloroethane	µg/L	2.0 U	50 U	4.0 U	4.0 U	8.0 U	10 U	4.0 U
Chloroform (Trichloromethane)	µg/L	3.4	50 U	4.0 U	4.0 U	8.0 U	10 U	4.0 U
Chloromethane (Methyl chloride)	µg/L	2.0 U	50 U	4.0 U	4.0 U	8.0 U	10 U	4.0 U
cis-1,2-Dichloroethene	µg/L	4.2	570	4.0 U	4.0 U	8.0 U	10 U	70
cis-1,3-Dichloropropene	µg/L	2.0 U	50 U	4.0 U	4.0 U	8.0 U	10 U	4.0 U
Cyclohexane	µg/L	1.1 J	50 U	4.0 U	4.0 U	8.0 U	10 U	4.0 U
Dibromochloromethane	µg/L	2.0 U	50 U	4.0 U	4.0 U	8.0 U	10 U	4.0 U
Dichlorodifluoromethane (CFC-12)	µg/L	2.0 U	50 U	4.0 U	4.0 U	8.0 U	10 U	4.0 U
Ethylbenzene	µg/L	2.0 U	50 U	4.0 U	4.0 U	8.0 U	10 U	4.0 U
Isopropyl benzene	µg/L	2.0 U	50 U	4.0 U	4.0 U	8.0 U	10 U	4.0 U
Methyl acetate	µg/L	5.0 U	130 U	10 U	10 U	20 U	25 U	10 U
Methyl cyclohexane	µg/L	1.2 J	50 U	4.0 U	4.0 U	8.0 U	10 U	4.0 U
Methyl tert butyl ether (MTBE)	µg/L	2.0 U	50 U	4.0 U	4.0 U	8.0 U	10 U	4.0 U
Methylene chloride	µg/L	2.0 U	50 U	4.0 U	4.0 U	8.0 U	10 U	4.0 U
Styrene	µg/L	2.0 U	50 U	4.0 U	4.0 U	8.0 U	10 U	4.0 U
Tetrachloroethene	µg/L	2.0 U	50 U	4.0 U	4.0 U	8.0 U	10 U	4.0 U
Toluene	µg/L	2.6	50 U	4.0 U	4.0 U	8.0 U	10 U	4.0 U
trans-1,2-Dichloroethene	µg/L	2.0 U	50 U	4.0 U	4.0 U	8.0 U	10 U	4.0 U
trans-1,3-Dichloropropene	µg/L	2.0 U	50 U	4.0 U	4.0 U	8.0 U	10 U	4.0 U
Trichloroethene	µg/L	37	4300	22	8.5	56	10 U	4.6
Trichlorofluoromethane (CFC-11)	µg/L	2.0 U	50 U	4.0 U	4.0 U	8.0 U	10 U	4.0 U
Trifluorotrichloroethane (CFC-113)	µg/L	2.0 U	50 U	4.0 U	4.0 U	8.0 U	10 U	4.0 U
Vinyl chloride	µg/L	2.0 U	50 U	4.0 U	4.0 U	8.0 U	10 U	26
Xylenes (total)	µg/L	4.0 U	100 U	8.0 U	8.0 U	16 U	20 U	8.0 U

Notes:

- J - Estimated concentration
- U - Not detected at the associated reporting limit
- UJ - Not detected; associated reporting limit is estimated
- 27 Exceeds NYSDEC TOGs Groundwater Standard

Table 2
Analytical Results Summary - Overburden Groundwater
Pre-Design Investigation
1130 Niagara Street Site (C915284)
Buffalo, New York

Location ID:	GP-54	GP-55	GP-56	GP-57	GP-61	GP-62	GP-63	
Sample Name:	WG-11219347-111220-AMC-096	WG-11219347-111220-AMC-097	WG-11219347-111320-AMC-127	WG-11219347-111020-AMC-039	WG-11219347-110920-AMC-009	WG-11219347-111020-AMC-037	WG-11219347-110920-AMC-016	
Sample Date:	11/12/2020	11/12/2020	11/13/2020	11/10/2020	11/09/2020	11/10/2020	11/09/2020	
Parameters	Unit							
Volatile Organic Compounds								
1,1,1-Trichloroethane	µg/L	610	160	39	6.7	90	4300	4.7
1,1,2,2-Tetrachloroethane	µg/L	20 U	25 U	10 U	1.0 U	25 U	100 U	1.0 U
1,1,2-Trichloroethane	µg/L	20 U	25 U	10 U	1.0 U	25 U	100 U	1.0 U
1,1-Dichloroethane	µg/L	56	460	11	2.9	110	100	19
1,1-Dichloroethene	µg/L	78	190	15	0.78 J	30	1300	1.2
1,2,4-Trichlorobenzene	µg/L	20 U	25 U	10 U	1.0 U	25 U	100 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	20 U	25 U	10 U	1.0 U	25 U	100 U	1.0 U
1,2-Dibromoethane (Ethylene dibromide)	µg/L	20 U	25 U	10 U	1.0 U	25 U	100 U	1.0 U
1,2-Dichlorobenzene	µg/L	20 U	25 U	10 U	1.0 U	25 U	100 U	1.0 U
1,2-Dichloroethane	µg/L	20 U	25 U	10 U	1.0 U	25 U	100 U	1.0 U
1,2-Dichloropropane	µg/L	20 U	25 U	10 U	1.0 U	25 U	100 U	1.0 U
1,3-Dichlorobenzene	µg/L	20 U	25 U	10 U	1.0 U	25 U	100 U	1.0 U
1,4-Dichlorobenzene	µg/L	20 U	25 U	10 U	1.0 U	25 U	100 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	200 U	250 U	100 U	10 U	250 U	1000 U	8.4 J
2-Hexanone	µg/L	100 U	130 U	50 U	5.0 U	130 U	500 U	5.0 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	100 U	130 U	50 U	5.0 U	130 U	500 U	5.0 U
Acetone	µg/L	200 U	250 U	30 J	10 U	250 U	1000 U	16
Benzene	µg/L	20 U	25 U	10 U	1.0 U	25 U	100 U	1.0 U
Bromodichloromethane	µg/L	20 U	25 U	10 U	1.0 U	25 U	100 U	1.0 U
Bromoform	µg/L	20 U	25 U	10 U	1.0 U	25 U	100 U	1.0 U
Bromomethane (Methyl bromide)	µg/L	20 U	25 U	10 U	1.0 U	25 U	100 U	1.0 U
Carbon disulfide	µg/L	20 U	25 U	10 U	1.0 U	25 U	100 U	0.35 J
Carbon tetrachloride	µg/L	20 U	25 U	10 U	1.0 U	25 U	100 U	1.0 U
Chlorobenzene	µg/L	20 U	25 U	10 U	1.0 U	25 U	100 U	1.0 U
Chloroethane	µg/L	20 U	25 U	10 U	1.0 U	25 U	100 U	1.0
Chloroform (Trichloromethane)	µg/L	20 U	25 U	10 U	0.37 J	25 U	100 U	1.0 U
Chloromethane (Methyl chloride)	µg/L	20 U	25 U	10 U	1.0 U	25 U	100 U	1.0 U
cis-1,2-Dichloroethene	µg/L	280	1200	82	4.0	240	520	35
cis-1,3-Dichloropropene	µg/L	20 U	25 U	10 U	1.0 U	25 U	100 U	1.0 U
Cyclohexane	µg/L	20 U	25 U	10 U	1.0 U	25 U	100 U	1.0 U
Dibromochloromethane	µg/L	20 U	25 U	10 U	1.0 U	25 U	100 U	1.0 U
Dichlorodifluoromethane (CFC-12)	µg/L	20 U	25 U	10 U	1.0 U	25 U	100 U	1.0 U
Ethylbenzene	µg/L	20 U	25 U	10 U	1.0 U	25 U	100 U	1.0 U
Isopropyl benzene	µg/L	20 U	25 U	10 U	1.0 U	25 U	100 U	1.0 U
Methyl acetate	µg/L	50 U	63 U	25 U	2.5 U	63 U	250 U	2.5 U
Methyl cyclohexane	µg/L	20 U	25 U	10 U	1.0 U	25 U	100 U	1.0 U
Methyl tert butyl ether (MTBE)	µg/L	20 U	25 U	10 U	1.0 U	25 U	100 U	1.0 U
Methylene chloride	µg/L	20 U	25 U	10 U	1.0 U	25 U	100 U	1.0 U
Styrene	µg/L	20 U	25 U	10 U	1.0 U	25 U	100 U	1.0 U
Tetrachloroethene	µg/L	20 U	25 U	10 U	1.0 U	25 U	100 U	1.0 U
Toluene	µg/L	20 U	39	10 U	1.0 U	25 U	100 U	1.0 U
trans-1,2-Dichloroethene	µg/L	20 U	25 U	12	1.0 U	25 U	100 U	56
trans-1,3-Dichloropropene	µg/L	20 U	25 U	10 U	1.0 U	25 U	100 U	1.0 U
Trichloroethene	µg/L	630	98	560	23	66	4900	10
Trichlorofluoromethane (CFC-11)	µg/L	20 U	25 U	10 U	1.0 U	25 U	100 U	1.0 U
Trifluorotrichloroethane (CFC-113)	µg/L	20 U	25 U	10 U	1.0 U	25 U	100 U	1.0 U
Vinyl chloride	µg/L	20 U	57	72	1.0 U	60	100 U	17
Xylenes (total)	µg/L	40 U	50 U	20 U	2.0 U	50 U	200 U	2.0 U

Notes:

J - Estimated concentration

U - Not detected at the associated reporting limit

UJ - Not detected; associated reporting limit is estimated

27 Exceeds NYSDEC TOGs Groundwater Standard

Table 2
Analytical Results Summary - Overburden Groundwater
Pre-Design Investigation
1130 Niagara Street Site (C915284)
Buffalo, New York

Location ID:	GP-64	GP-68	GP-69	
Sample Name:	WG-11219347-112520-AMC-213	WG-11219347-111720-AMC-177	WG-11219347-111820-AMC-180	
Sample Date:	11/25/2020	11/17/2020	11/18/2020	
	Unit			
) (MIBK)	µg/L	2.3	2100	4.0 U
	µg/L	2.0 U	50 U	4.0 U
	µg/L	2.0 U	50 U	4.0 U
	µg/L	5.2	190	12
	µg/L	1.5 J	830	4.0 U
	µg/L	2.0 U	50 U	4.0 U
	µg/L	2.0 U	50 U	4.0 U
	µg/L	2.0 U	50 U	4.0 U
	µg/L	2.0 U	50 U	4.0 U
	µg/L	2.0 U	50 U	4.0 U
	µg/L	2.0 U	50 U	4.0 U
	µg/L	2.0 U	50 U	4.0 U
	µg/L	20 U	500 U	40 U
	µg/L	10 U	250 U	20 U
	µg/L	10 U	250 U	20 U
	µg/L	20 U	500 U	40 U
	µg/L	2.0 U	50 U	4.0 U
	µg/L	2.0 U	50 U	4.0 U
	µg/L	2.0 U	50 U	4.0 U
	µg/L	2.0 U	50 U	4.0 U
	µg/L	2.0 U	26 J	4.0 U
	µg/L	2.0 U	50 U	4.0 U
	µg/L	2.0 U	50 U	4.0 U
	µg/L	2.0 U	50 U	4.0 U
	µg/L	2.0 U	50 U	4.0 U
	µg/L	2.0 U	50 U	4.0 U
	µg/L	2.0 U	50 U	4.0 U
	µg/L	11	980	32
	µg/L	2.0 U	50 U	4.0 U
	µg/L	2.0 U	50 U	4.0 U
	µg/L	2.0 U	50 U	4.0 U
	µg/L	2.0 U	50 U	4.0 U
	µg/L	2.0 U	50 U	4.0 U
	µg/L	2.0 U	50 U	4.0 U
	µg/L	5.0 U	130 U	10 U
	µg/L	0.49 J	50 U	4.0 U
	µg/L	2.0 U	50 U	4.0 UJ
	µg/L	2.0 U	50 U	4.0 U
	µg/L	2.0 U	50 U	4.0 U
	µg/L	2.0 U	50 U	4.0 U
	µg/L	2.0 U	50 U	4.0 U
	µg/L	2.0 U	50 U	11
	µg/L	2.0 U	50 U	4.0 U
	µg/L	14	2900	41
	µg/L	2.0 U	50 U	4.0 U
	µg/L	2.0 U	50 U	4.0 U
	µg/L	2.5	98	9.4
	µg/L	4.0 U	100 U	8.0 U

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit
UJ - Not detected; associated reporting limit is estimated

27 Exceeds NYSDEC TOGs Groundwater Standard

Table 3
Analytical Results Summary - Bedrock Groundwater
Pre-Design Investigation
1130 Niagara Street Site (C915284)
Buffalo, New York

Location ID:		MW-106		MW-107		MW-108		MW-109		MW-110		MW-110	
Sample Name:		WG-11219347-120420-AMC-237		WG-11219347-120420-AMC-238		WG-11219347-120420-AMC-239		WG-11219347-120420-AMC-234		WG-11219347-120420-AMC-235		WG-11219347-120420-AMC-236	
Sample Date:		12/04/2020		12/04/2020		12/04/2020		12/04/2020		12/04/2020		12/04/2020	
		NYSDEC TOGs											
		Groundwater											
		Guidance Value Standard										Duplicate	
Parameters		Unit											
Volatile Organic Compounds													
1,1,1-Trichloroethane	µg/L	NC	5	130	50000	170	490000			4000 U		4000 U	
1,1,2,2-Tetrachloroethane	µg/L	NC	5	25 U	2000 U	80 U	20000 U			4000 U		4000 U	
1,1,2-Trichloroethane	µg/L	NC	1	25 U	2000 U	80 U	20000 U			4000 U		4000 U	
1,1-Dichloroethane	µg/L	NC	5	34	1500 J	80 U	20000 U			1600 J		1700 J	
1,1-Dichloroethene	µg/L	NC	5	51	7200	53 J	43000			2600 J		4000 U	
1,2,4-Trichlorobenzene	µg/L	NC	5	25 U	2000 U	80 U	20000 U			4000 U		4000 U	
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	NC	0.04	25 U	2000 U	80 U	20000 U			4000 U		4000 U	
1,2-Dibromoethane (Ethylene dibromide)	µg/L	NC	0.0006	25 U	2000 U	80 U	20000 U			4000 U		4000 U	
1,2-Dichlorobenzene	µg/L	NC	3	25 U	2000 U	80 U	20000 U			4000 U		4000 U	
1,2-Dichloroethane	µg/L	NC	0.6	25 U	2000 U	80 U	20000 U			4000 U		4000 U	
1,2-Dichloropropane	µg/L	NC	1	25 U	2000 U	80 U	20000 U			4000 U		4000 U	
1,3-Dichlorobenzene	µg/L	NC	3	25 U	2000 U	80 U	20000 U			4000 U		4000 U	
1,4-Dichlorobenzene	µg/L	NC	3	25 U	2000 U	80 U	20000 U			4000 U		4000 U	
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	50	NC	250 U	20000 U	800 U	200000 U			40000 U		40000 U	
2-Hexanone	µg/L	50	NC	130 U	10000 U	400 U	100000 U			20000 U		20000 U	
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	NC	NC	130 U	10000 U	400 U	100000 U			20000 U		20000 U	
Acetone	µg/L	50	NC	250 U	20000 U	800 U	200000 U			40000 U		40000 U	
Benzene	µg/L	NC	1	25 U	2000 U	80 U	20000 U			4000 U		4000 U	
Bromodichloromethane	µg/L	50	NC	25 U	2000 U	80 U	20000 U			4000 U		4000 U	
Bromoform	µg/L	50	NC	25 U	2000 U	80 U	20000 U			4000 U		4000 U	
Bromomethane (Methyl bromide)	µg/L	NC	5	25 U	2000 U	80 U	20000 U			4000 U		4000 U	
Carbon disulfide	µg/L	60	60	25 U	2000 U	80 U	20000 U			4000 U		4000 U	
Carbon tetrachloride	µg/L	NC	5	25 U	2000 U	80 U	20000 U			4000 U		4000 U	
Chlorobenzene	µg/L	NC	5	25 U	2000 U	80 U	20000 U			4000 U		4000 U	
Chloroethane	µg/L	NC	5	25 U	2000 U	80 U	20000 U			4000 U		4000 U	
Chloroform (Trichloromethane)	µg/L	NC	7	25 U	2000 U	80 U	20000 U			4000 U		4000 U	
Chloromethane (Methyl chloride)	µg/L	NC	5	25 U	2000 U	80 U	20000 U			4000 U		4000 U	
cis-1,2-Dichloroethene	µg/L	NC	5	160	2000 U	200	20000 U			31000		31000	
cis-1,3-Dichloropropene	µg/L	NC	NC	25 U	2000 U	80 U	20000 U			4000 U		4000 U	
Cyclohexane	µg/L	NC	NC	7.5 J	2000 U	80 U	20000 U			4000 U		4000 U	
Dibromochloromethane	µg/L	50	NC	25 U	2000 U	80 U	20000 U			4000 U		4000 U	
Dichlorodifluoromethane (CFC-12)	µg/L	NC	5	25 U	2000 U	80 U	20000 U			4000 U		4000 U	
Ethylbenzene	µg/L	NC	5	25 U	2000 U	80 U	20000 U			4000 U		4000 U	
Isopropyl benzene	µg/L	NC	5	25 U	2000 U	80 U	20000 U			4000 U		4000 U	
Methyl acetate	µg/L	NC	NC	63 U	5000 U	200 U	50000 U			10000 U		10000 U	
Methyl cyclohexane	µg/L	NC	NC	9.8 J	2000 U	80 U	20000 U			4000 U		4000 U	
Methyl tert butyl ether (MTBE)	µg/L	10	NC	25 U	2000 U	80 U	20000 U			4000 U		4000 U	
Methylene chloride	µg/L	NC	5	25 U	2000 U	80 U	20000 U			4000 U		4000 U	
Styrene	µg/L	NC	5	25 U	2000 U	80 U	20000 U			4000 U		4000 U	
Tetrachloroethene	µg/L	NC	5	25 U	2000 U	80 U	20000 U			4000 U		4000 U	
Toluene	µg/L	NC	5	25 U	2000 U	80 U	20000 U			4000 U		4000 U	
trans-1,2-Dichloroethene	µg/L	NC	5	25 U	2000 U	80 U	20000 U			4000 U		4000 U	
trans-1,3-Dichloropropene	µg/L	NC	NC	25 U	2000 U	80 U	20000 U			4000 U		4000 U	
Trichloroethene	µg/L	NC	5	1700	200000	2400	280000			130000		130000	
Trichlorofluoromethane (CFC-11)	µg/L	NC	5	25 U	2000 U	80 U	20000 U			4000 U		4000 U	
Trifluorotrichloroethane (CFC-113)	µg/L	NC	5	25 U	2000 U	80 U	20000 U			4000 U		4000 U	
Vinyl chloride	µg/L	NC	2	25 U	2000 U	80 U	20000 U			4000 U		4000 U	
Xylenes (total)	µg/L	NC	5	50 U	4000 U	160 U	40000 U			8000 U		8000 U	

Notes:
J - Estimated concentration
U - Not detected at the associated reporting limit
UJ - Not detected; associated reporting limit is estimated
27 Exceeds NYSDEC TOGs Groundwater Standard

Table 4

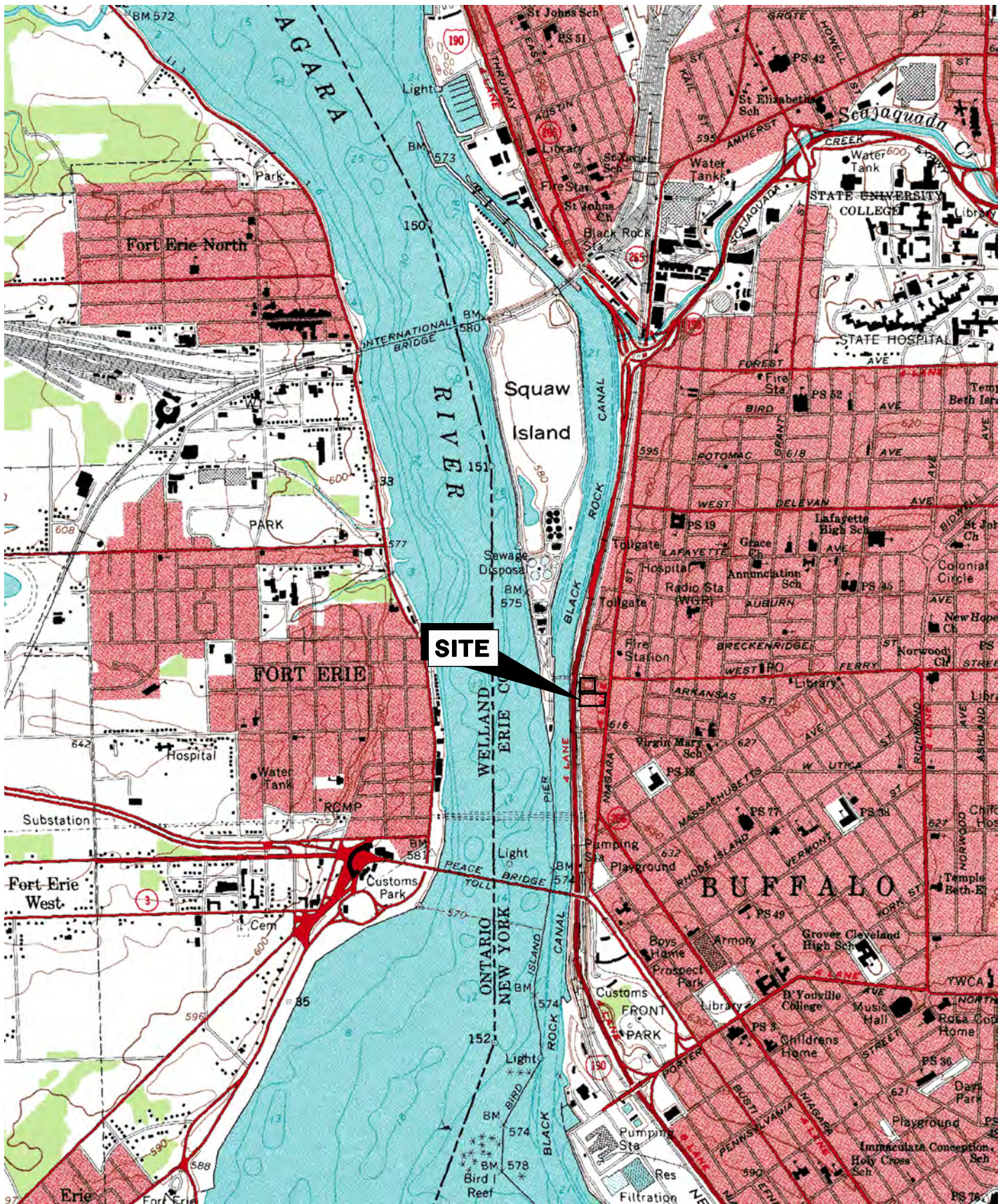
Analytical Results Summary - Bedrock Groundwater Packer Test
Pre-Design Investigation
1130 Niagara Street Site (C915284)
Buffalo, New York

Location ID:				MW-102	MW-102	MW-105	MW-105
Fracture Zone:				19-24 ft bgs	35-38 ft bgs	23-28 ft bgs	33-38 ft bgs
Sample Name:				WG-11219347-111920-AMC-187	WG-11219347-112020-AMC-188	WG-11219347-111920-AMC-186	WG-11219347-111820-AMC-185
Sample Date:				11/19/2020	11/20/2020	11/19/2020	11/18/2020
Purge Volume:				1 gallon, dry	1 gallon, dry	1.5 gallons, dry	3.5 gallons, dry
NYSDEC TOGs Groundwater Guidance Value Standard							
Parameters	Unit						
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/L	NC	5	5400	10000	380	130
1,1,2,2-Tetrachloroethane	µg/L	NC	5	1000 U	1000 U	100 U	10 U
1,1,2-Trichloroethane	µg/L	NC	1	1000 U	1000 U	100 U	10 U
1,1-Dichloroethane	µg/L	NC	5	1700	1800	56 J	27
1,1-Dichloroethene	µg/L	NC	5	1300	2000	100	40
1,2,4-Trichlorobenzene	µg/L	NC	5	1000 U	1000 U	100 U	10 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	NC	0.04	1000 U	1000 U	100 U	10 U
1,2-Dibromoethane (Ethylene dibromide)	µg/L	NC	0.0006	1000 U	1000 U	100 U	10 U
1,2-Dichlorobenzene	µg/L	NC	3	1000 U	1000 U	100 U	10 U
1,2-Dichloroethane	µg/L	NC	0.6	1000 U	1000 U	100 U	10 U
1,2-Dichloropropane	µg/L	NC	1	1000 U	1000 U	100 U	10 U
1,3-Dichlorobenzene	µg/L	NC	3	1000 U	1000 U	100 U	10 U
1,4-Dichlorobenzene	µg/L	NC	3	1000 U	1000 U	100 U	10 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	50	NC	10000 U	10000 U	1000 U	100 U
2-Hexanone	µg/L	50	NC	5000 U	5000 U	500 U	50 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	NC	NC	5000 U	5000 U	500 U	50 U
Acetone	µg/L	50	NC	10000 U	10000 U	1000 U	100 U
Benzene	µg/L	NC	1	1000 U	1000 U	100 U	10 U
Bromodichloromethane	µg/L	50	NC	1000 U	1000 U	100 U	10 U
Bromoform	µg/L	50	NC	1000 U	1000 U	100 U	10 U
Bromomethane (Methyl bromide)	µg/L	NC	5	1000 U	1000 U	100 U	10 U
Carbon disulfide	µg/L	60	60	1000 U	1000 U	100 U	10 U
Carbon tetrachloride	µg/L	NC	5	1000 U	1000 U	100 U	10 U
Chlorobenzene	µg/L	NC	5	1000 U	1000 U	100 U	10 U
Chloroethane	µg/L	NC	5	1000 U	1000 U	100 U	10 U
Chloroform (Trichloromethane)	µg/L	NC	7	1000 U	1000 U	100 U	10 U
Chloromethane (Methyl chloride)	µg/L	NC	5	1000 U	1000 U	100 U	10 U
cis-1,2-Dichloroethene	µg/L	NC	5	4700	11000	520	260
cis-1,3-Dichloropropene	µg/L	NC	NC	1000 U	1000 U	100 U	10 U
Cyclohexane	µg/L	NC	NC	1000 U	1000 U	100 U	10 U
Dibromochloromethane	µg/L	50	NC	1000 U	1000 U	100 U	10 U
Dichlorodifluoromethane (CFC-12)	µg/L	NC	5	1000 U	1000 U	100 U	10 U
Ethylbenzene	µg/L	NC	5	1000 U	1000 U	100 U	10 U
Isopropyl benzene	µg/L	NC	5	1000 U	1000 U	100 U	10 U
Methyl acetate	µg/L	NC	NC	2500 U	2500 U	250 U	25 U
Methyl cyclohexane	µg/L	NC	NC	1000 U	1000 U	100 U	10 U
Methyl tert butyl ether (MTBE)	µg/L	10	NC	1000 UJ	1000 U	100 UJ	10 UJ
Methylene chloride	µg/L	NC	5	1000 U	1000 U	100 U	10 U
Styrene	µg/L	NC	5	1000 U	1000 U	100 U	10 U
Tetrachloroethene	µg/L	NC	5	1000 U	1000 U	100 U	10 U
Toluene	µg/L	NC	5	1000 U	1000 U	100 U	10 U
trans-1,2-Dichloroethene	µg/L	NC	5	1000 U	1000 U	100 U	10 U
trans-1,3-Dichloropropene	µg/L	NC	NC	1000 U	1000 U	100 U	10 U
Trichloroethene	µg/L	NC	5	70000	29000	3000	810
Trichlorofluoromethane (CFC-11)	µg/L	NC	5	1000 U	1000 U	100 U	10 U
Trifluorotrichloroethane (CFC-113)	µg/L	NC	5	1000 U	1000 U	100 U	10 U
Vinyl chloride	µg/L	NC	2	1000 U	1000 U	100 U	10 U
Xylenes (total)	µg/L	NC	5	2000 U	2000 U	200 U	20 U

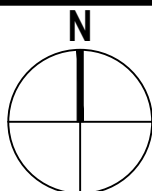
Notes:

- J - Estimated concentration
- U - Not detected at the associated reporting limit
- UJ - Not detected; associated reporting limit is estimated
- Exceeds NYSDEC TOGs Groundwater Standard

Figures



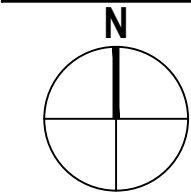
SOURCE: USGS 7.5 MINUTE SERIES, TOPO QUAD: BUFFALO NW, NY 1965



BUFFALO, NEW YORK
1130 NIAGARA STREET SITE - C915284
PARCELS 1 AND 2 REMEDIAL ACTION WORK PLAN
SITE LOCATION MAP

Project No. 11219347
 Date JAN 2022

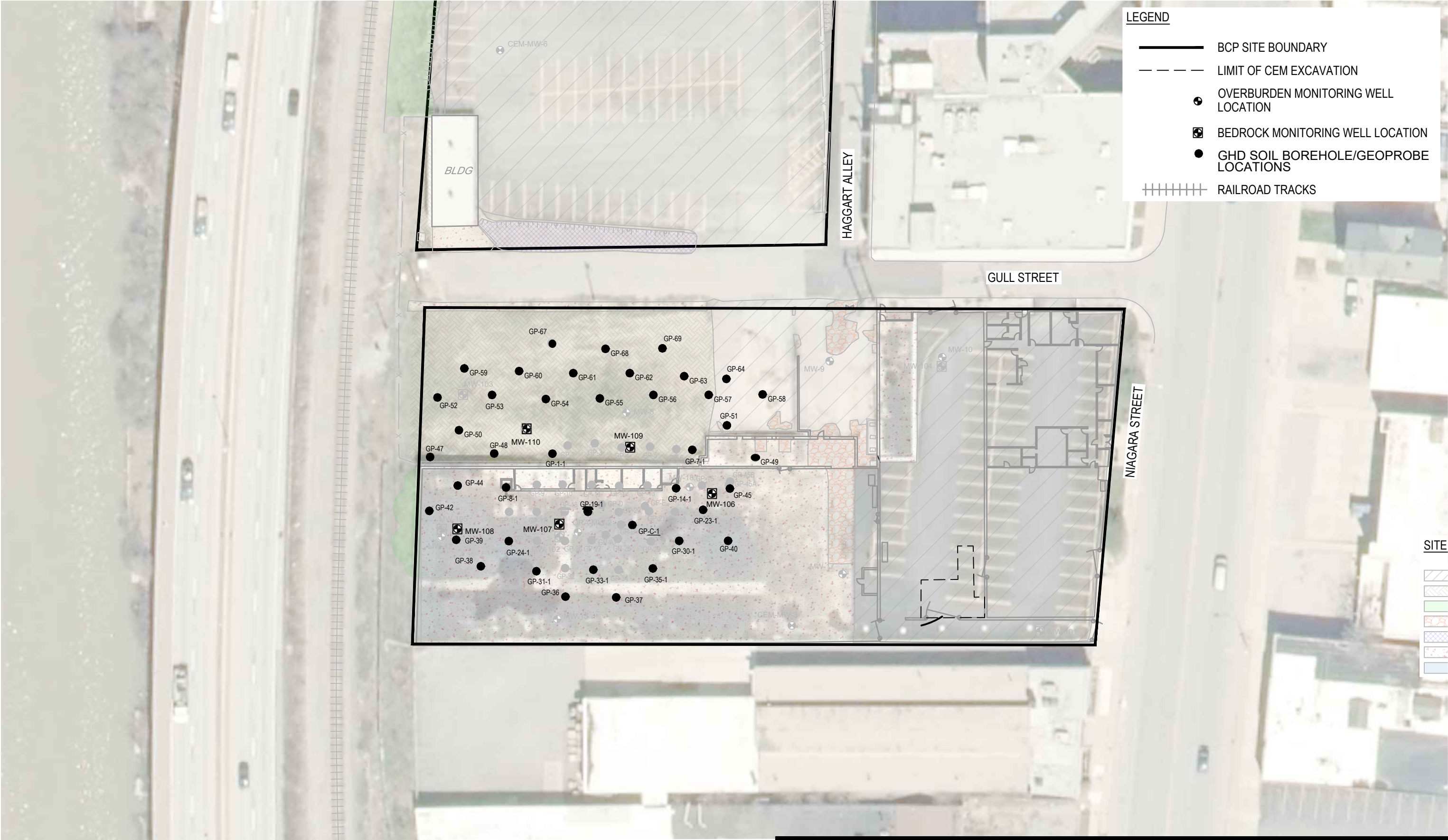
FIGURE 1.1

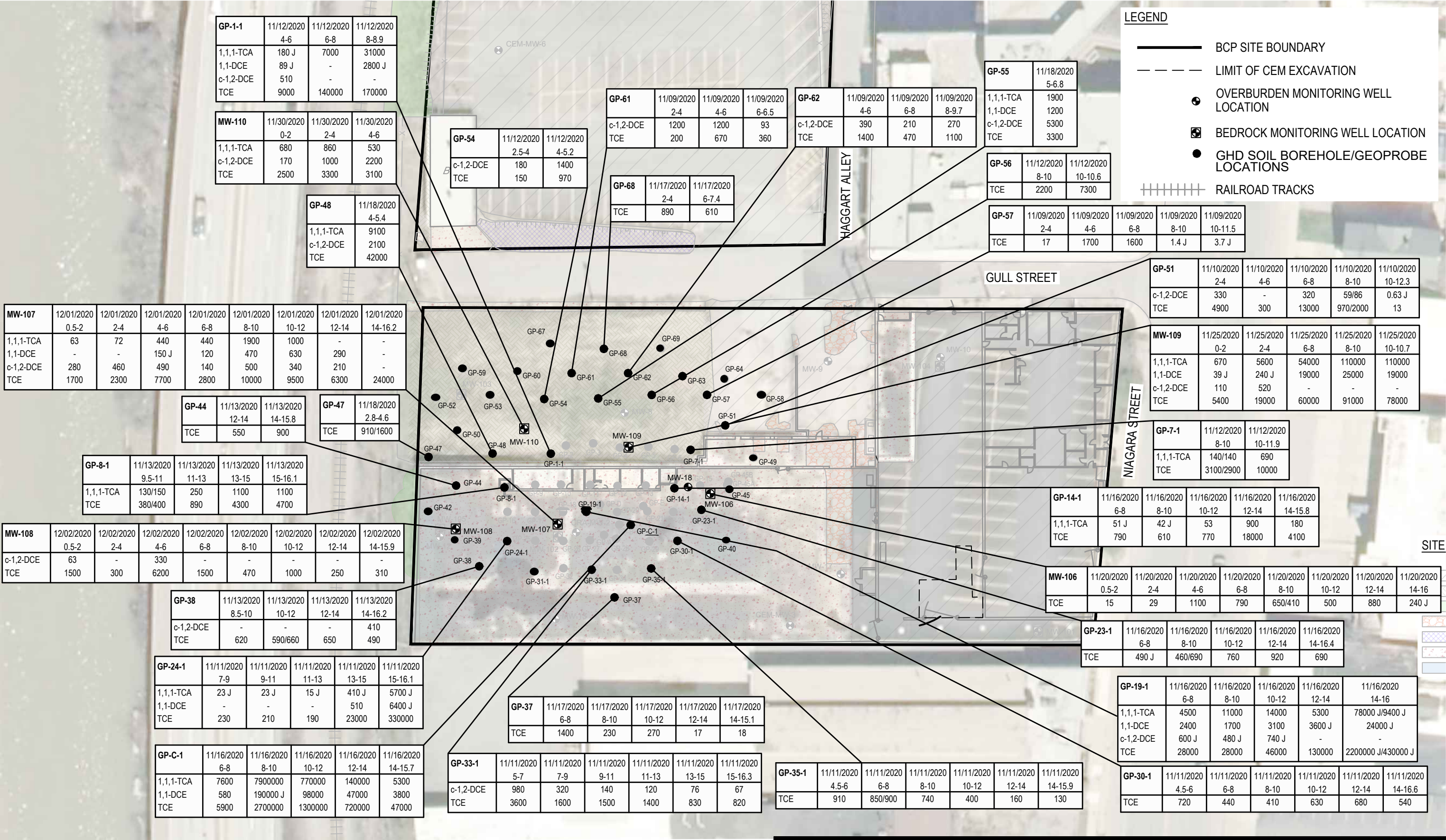


BUFFALO, NEW YORK
1130 NIAGARA STREET SITE - C915284
PARCELS 1 AND 2 REMEDIAL ACTION WORK PLAN
SITE PLAN

Project No. 11219347
Date JAN 2022

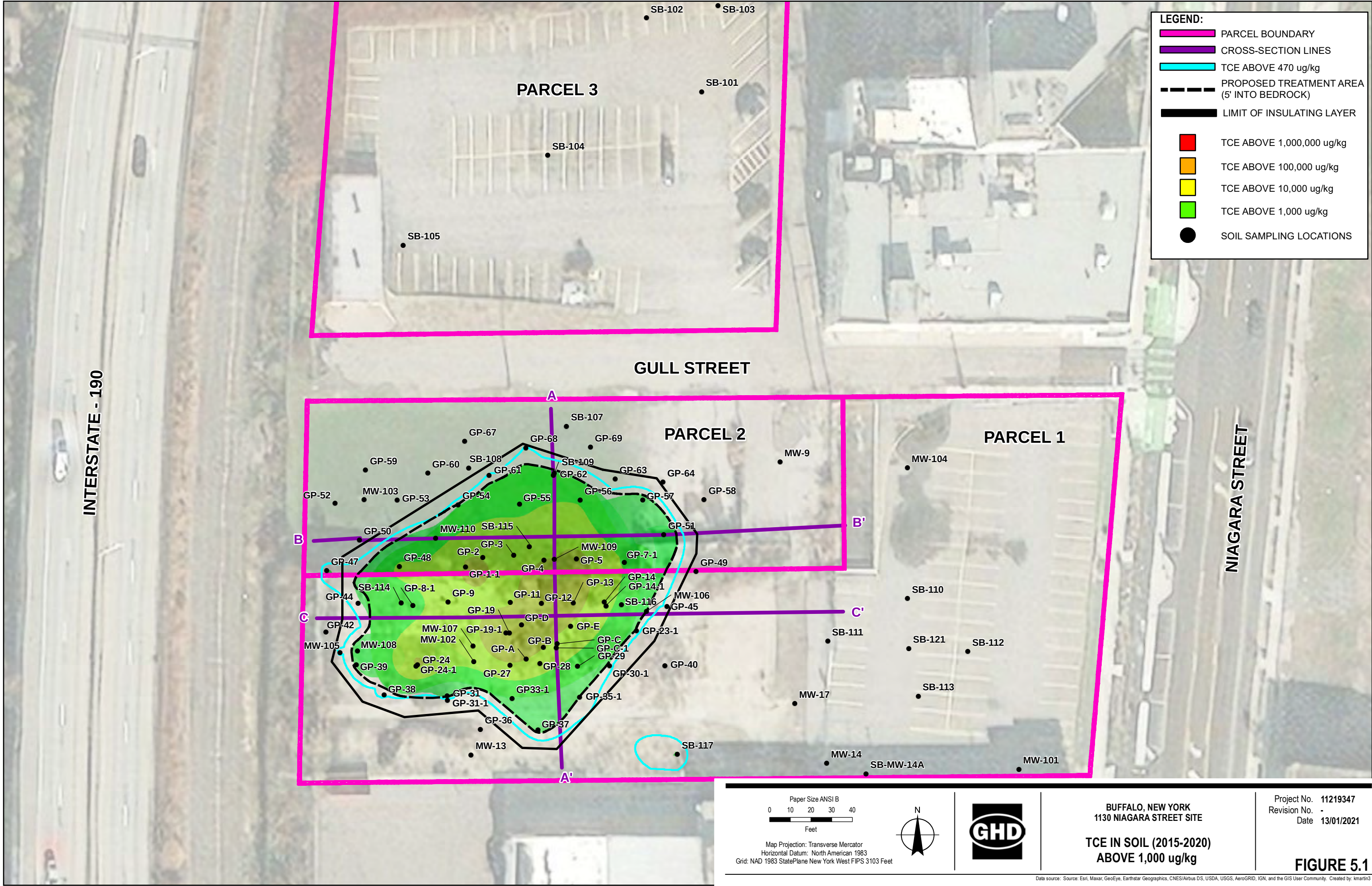
FIGURE 1.2

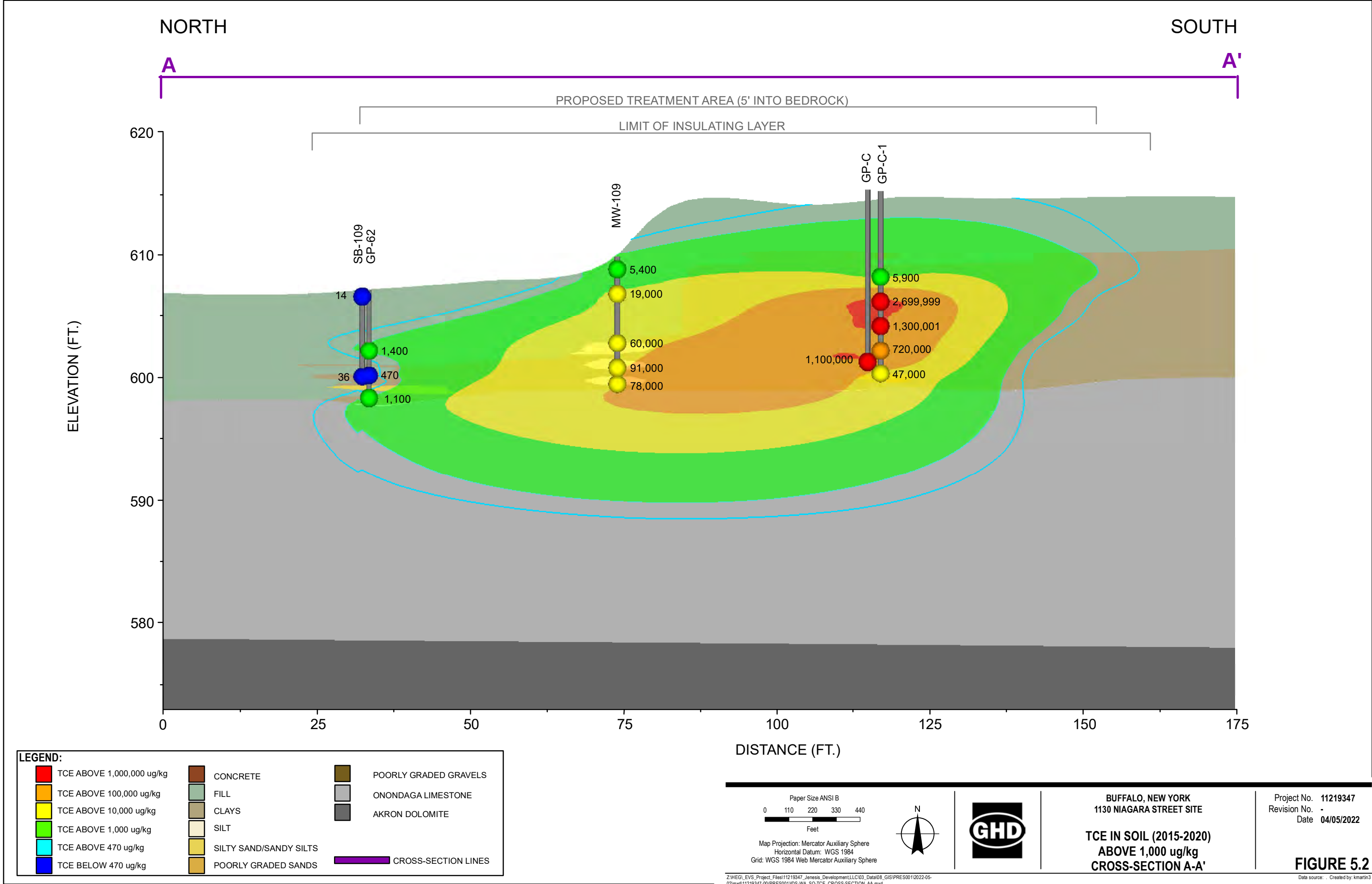


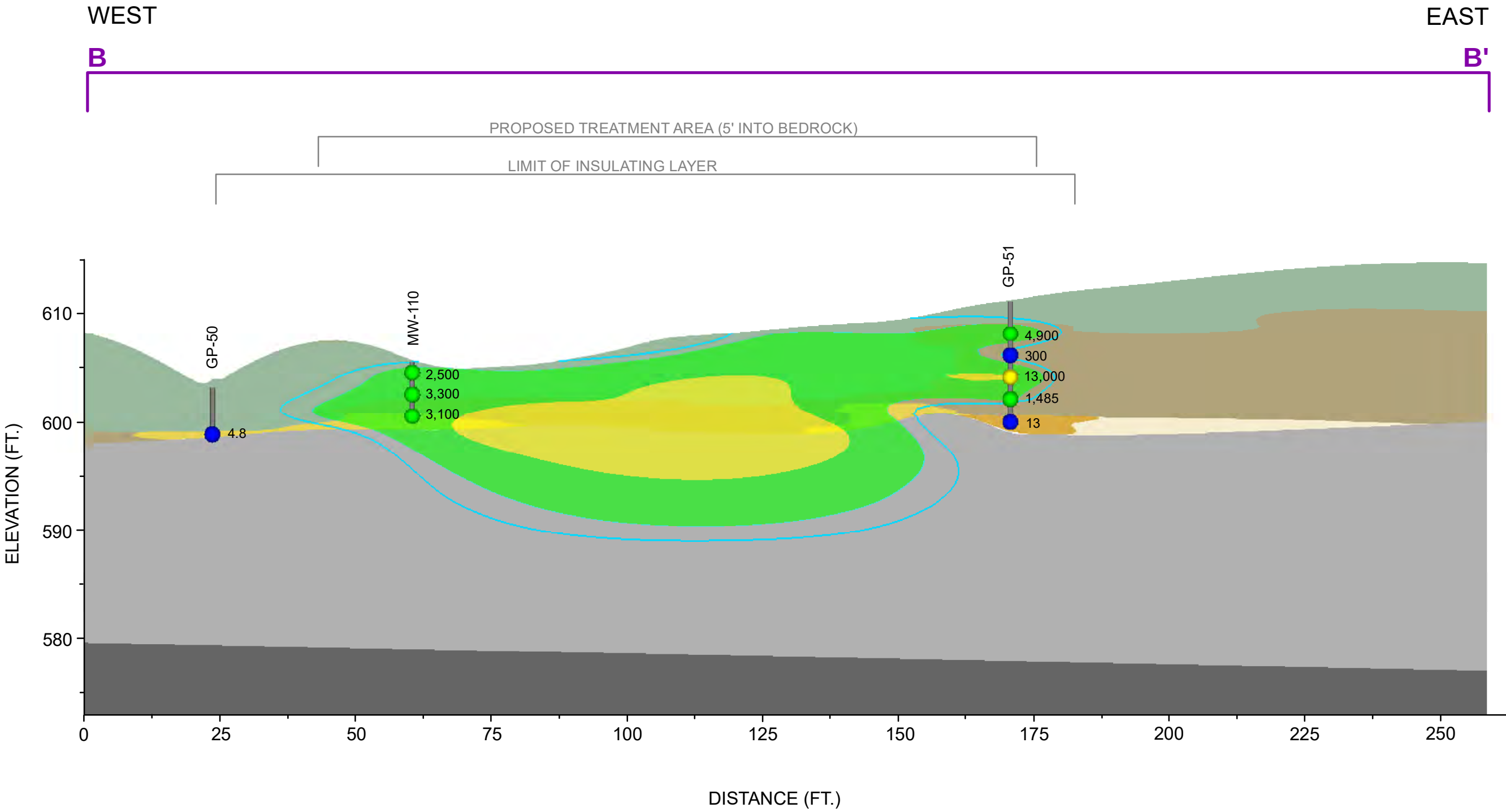


SAMPLE LOCATION		
SAMPLE DATE		
DEPTH IN ft BGS)		
RESULT		
PARAMETER		

GP-68	11/17/2020	11/17/2020
	2-4	6-7.4
TCE	890	610







LEGEND:

TCE ABOVE 1,000,000 ug/kg	CONCRETE	POORLY GRADED GRAVELS
TCE ABOVE 100,000 ug/kg	FILL	ONONDAGA LIMESTONE
TCE ABOVE 10,000 ug/kg	CLAYS	AKRON DOLOMITE
TCE ABOVE 1,000 ug/kg	SILT	
TCE ABOVE 470 ug/kg	SILTY SAND/SANDY SILTS	
TCE BELOW 470 ug/kg	POORLY GRADED SANDS	CROSS-SECTION LINES

0 120 240 360 480

Feet

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxiliary Sphere

N

BUFFALO, NEW YORK
1130 NIAGARA STREET SITE

**TCE IN SOIL (2015-2020)
ABOVE 1,000 ug/kg
CROSS-SECTION B-B'**

Project No. 11219347
Revision No. -
Date 13/01/2022

FIGURE 5.3

Data source: . Created by: kmartin3

Z:\HEGL\EVs_Project_Files\11219347_Jenesis_Development\LLC\03_Data\08_GIS\PRE001\2022-05-02\mxd\11219347-00(PRES001)JDS-WA_SO-TCE_CROSS-SECTION_BB.mxd
Print date: 05 May 2022 - 09:53

WEST

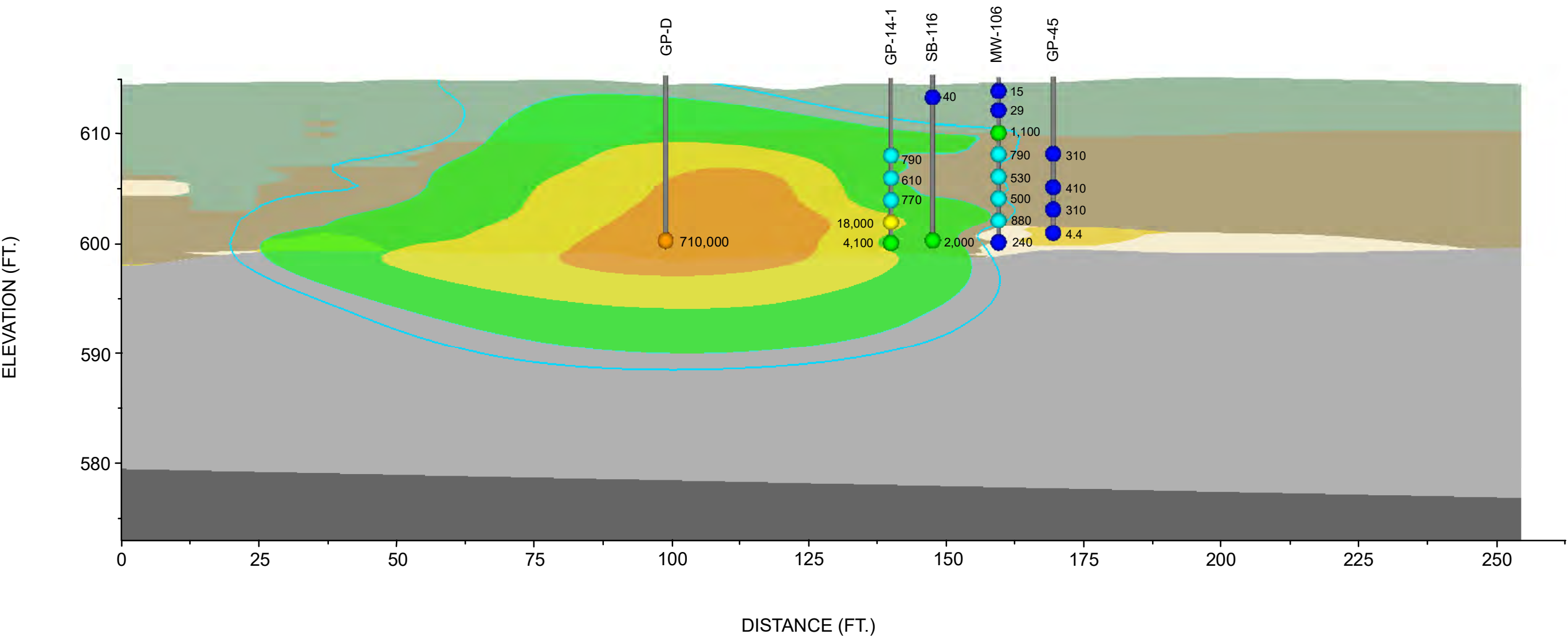
EAST

C

C'

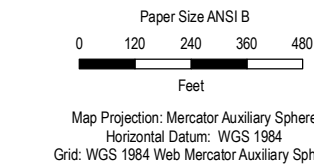
PROPOSED TREATMENT AREA (5' INTO BEDROCK)

LIMIT OF INSULATING LAYER



LEGEND:

	TCE ABOVE 1,000,000 ug/kg		CONCRETE		POORLY GRADED GRAVELS
	TCE ABOVE 100,000 ug/kg		FILL		ONONDAGA LIMESTONE
	TCE ABOVE 10,000 ug/kg		CLAYS		AKRON DOLOMITE
	TCE ABOVE 1,000 ug/kg		SILT		
	TCE ABOVE 470 ug/kg		SILTY SAND/SANDY SILTS		
	TCE BELOW 470 ug/kg		POORLY GRADED SANDS		CROSS-SECTION LINES

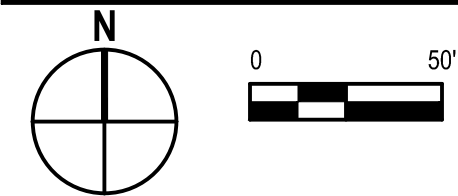
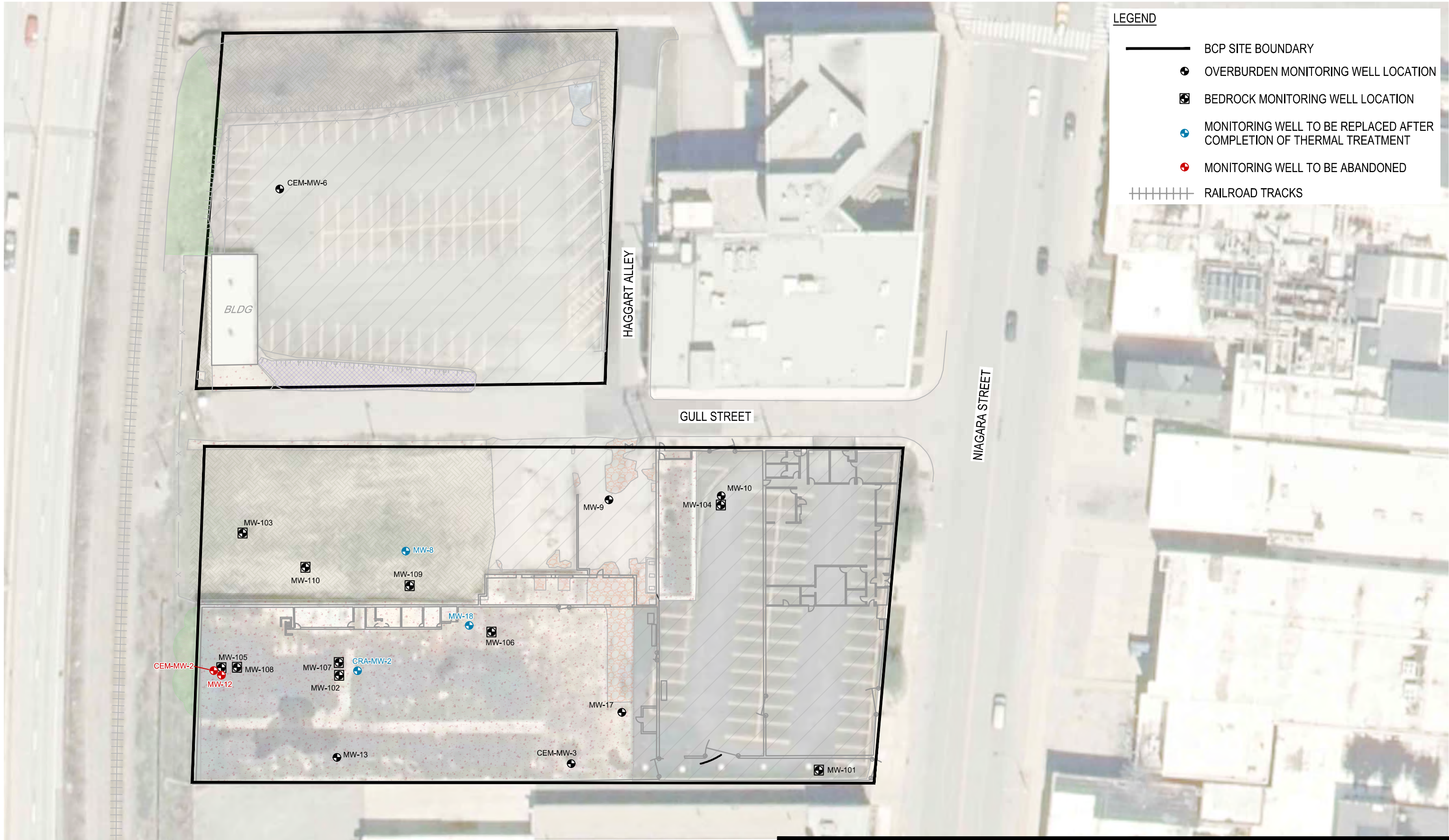


BUFFALO, NEW YORK
1130 NIAGARA STREET SITE

TCE IN SOIL (2015-2020)
ABOVE 1,000 ug/kg
CROSS-SECTION C-C'

Project No. 11219347
Revision No. -
Date 13/01/2022

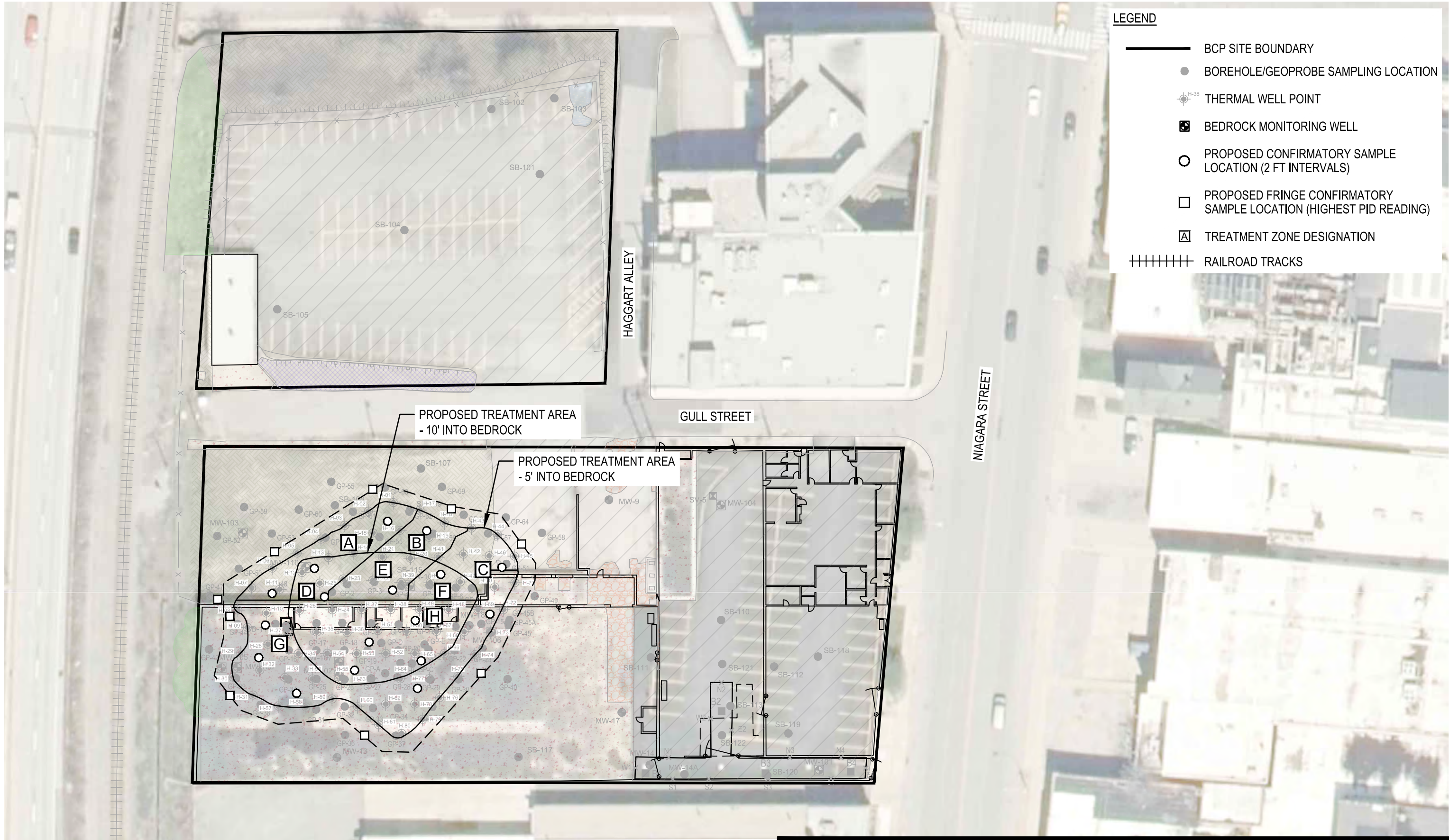
FIGURE 5.4



BUFFALO, NEW YORK
1130 NIAGARA STREET SITE - C915264
PARCELS 1 AND 2 REMEDIAL ACTION WORK PLAN
**MONITORING WELLS FOR
ABANDONMENT / REPLACEMENT**

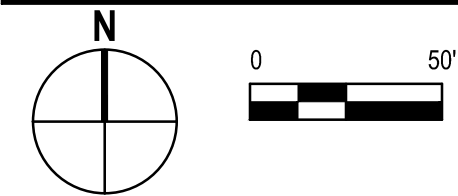
Project No. 11219347
Date JUL 2022

FIGURE 7.1



LEGEND

- BCP SITE BOUNDARY
- BOREHOLE/GEOPROBE SAMPLING LOCATION
- THERMAL WELL POINT
- BEDROCK MONITORING WELL
- PROPOSED CONFIRMATORY SAMPLE LOCATION (2 FT INTERVALS)
- PROPOSED FRINGE CONFIRMATORY SAMPLE LOCATION (HIGHEST PID READING)
- TREATMENT ZONE DESIGNATION
- RAILROAD TRACKS



BUFFALO, NEW YORK
1130 NIAGARA STREET SITE - C915264
PARCELS 1 AND 2 REMEDIAL ACTION WORK PLAN
PROPOSED POST-TREATMENT
CONFIRMATORY SAMPLE LOCATIONS

Project No. 11219347
Date JUL 2022

FIGURE 7.2

FIGURE 11.1
ESTIMATED PROJECT SCHEDULE - PARCELS 1 AND 2 REMEDIATION
1130 NIAGARA STREET SITE, NYSDEC SITE #C915284
BUFFALO, NEW YORK

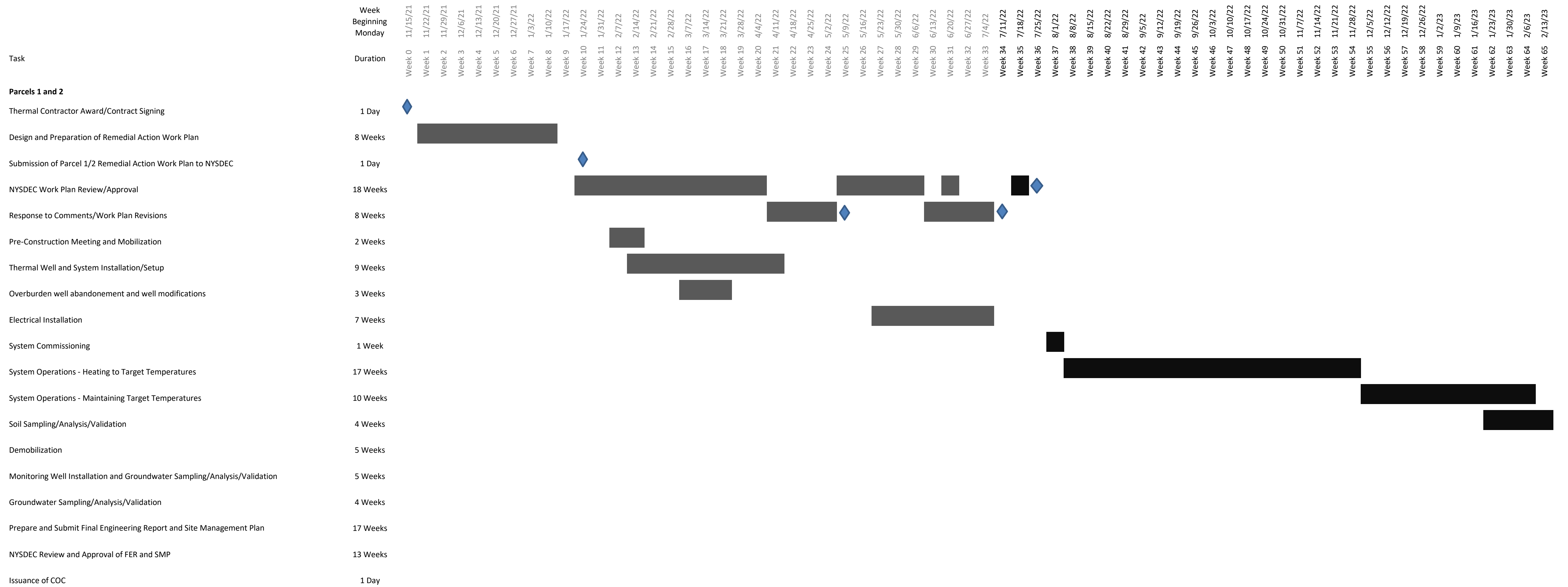


FIGURE 11.1
ESTIMATED PROJECT SCHEDULE - PARCELS 1 AND 2 REMEDIATION
1130 NIAGARA STREET SITE, NYSDEC SITE #C915284
BUFFALO, NEW YORK

Task	Duration	Week Beginning Monday																																							
		Week 66 2/20/23	Week 67 2/27/23	Week 68 3/6/23	Week 69 3/13/23	Week 70 3/20/23	Week 71 3/27/23	Week 72 4/3/23	Week 73 4/10/23	Week 74 4/17/23	Week 75 4/24/23	Week 76 5/1/23	Week 77 5/8/23	Week 78 5/15/23	Week 79 5/22/23	Week 80 5/29/23	Week 81 6/5/23	Week 82 6/12/23	Week 83 6/19/23	Week 84 6/26/23	Week 85 7/3/23	Week 86 7/10/23	Week 87 7/17/23	Week 88 7/24/23	Week 89 7/31/23	Week 90 8/7/23	Week 91 8/14/23	Week 92 8/21/23	Week 93 8/28/23	Week 94 9/4/23	Week 95 9/11/23	Week 96 9/18/23	Week 97 9/25/23	Week 98 10/2/23	Week 99 10/9/23	Week 100 10/16/23	Week 101 10/23/23	Week 102 10/30/23	Week 103 11/6/23	Week 104 11/13/23	Week 105 11/20/23
Parcels 1 and 2																																									
Thermal Contractor Award/Contract Signing	1 Day																																								
Design and Preparation of Remedial Action Work Plan	8 Weeks																																								
Submission of Parcel 1/2 Remedial Action Work Plan to NYSDEC	1 Day																																								
NYSDEC Work Plan Review/Approval	18 Weeks																																								
Response to Comments/Work Plan Revisions	8 Weeks																																								
Pre-Construction Meeting and Mobilization	2 Weeks																																								
Thermal Well and System Installation/Setup	9 Weeks																																								
Overburden well abandonement and well modifications	3 Weeks																																								
Electrical Installation	7 Weeks																																								
System Commissioning	1 Week																																								
System Operations - Heating to Target Temperatures	17 Weeks																																								
System Operations - Maintaining Target Temperatures	10 Weeks																																								
Soil Sampling/Analysis/Validation	4 Weeks																																								
Demobilization	5 Weeks																																								
Monitoring Well Installation and Groundwater Sampling/Analysis/Validation	5 Weeks																																								
Groundwater Sampling/Analysis/Validation	4 Weeks																																								
Prepare and Submit Final Engineering Report and Site Management Plan	17 Weeks																																								
NYSDEC Review and Approval of FER and SMP	13 Weeks																																								
Issuance of COC	1 Day																																								

Appendices

Appendix A

PDI Boring Logs and Well Construction Logs



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: Genesis Development
PROJECT NUMBER: 11219347
CLIENT: Genesis Development, LLC
LOCATION: 1130 Niagara Street, Buffalo, NY

HOLE DESIGNATION: GP-1-1
DATE COMPLETED: 12 November 2020
DRILLING METHOD: HSA Split Spoon
FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	GAS PROBE	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1062001 EASTING: 1063227 GROUND SURFACE	607.19						
2	SAND (FILL), trace gravel, compact, fine to medium sand, fine and coarse gravel, brown, moist, ash, concrete, brick					3.37		
						2.70		
						3.05		
4						3.17		
	CL-CLAY, with silt, trace gravel, very stiff, low plasticity, slow dilatancy, medium toughness, fine gravel, orange-brown, dry to moist	603.19		1		4.24	090	4 - 6'
6						4.68		
	ML-SILT, with sand, trace gravel, compact, non-plastic, fine sand, fine rounded gravel, light brown, moist	601.19		2		3.36	091	6 - 8'
8						35.97		
	- with sand, strong odor at 8.1ft BGS - trace sand at 8.4ft BGS - Refusal, WG-098 at 8.9ft BGS			3		25.90	092	8 - 8.9'
10	END OF BOREHOLE @ 8.9ft BGS	598.29						
12								
14								
16								
18								
20								
22								
24								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 12, 2020

CHEMICAL ANALYSIS ○

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STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: Genesis Development
PROJECT NUMBER: 11219347
CLIENT: Genesis Development, LLC
LOCATION: 1130 Niagara Street, Buffalo, NY

HOLE DESIGNATION: GP-7-1
DATE COMPLETED: 12 November 2020
DRILLING METHOD: HSA Split Spoon
FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	GAS PROBE	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1062003 EASTING: 1063303	GROUND SURFACE 610.75						
2	SAND (FILL), with gravel, fine to medium sand, some coarse sand, fine and coarse gravel, compact, brown, moist, brick, concrete	609.05				2.53		
						2.22		
4	CLAY (FILL), very stiff, medium plasticity, slow dilatancy, medium toughness, orange-brown, dry to moist - fabric at 2.0ft BGS - concrete from 3.0 to 4.0ft BGS	606.75				1.70		
						2.13		
6	FILL, rock, sand, fine and medium sand, brown, concrete - with fine gravel, coarse sand, gray-blue at 6.0ft BGS					3.41		
						2.09		
8						2.45		
						2.95		
	- plastic pieces at 7.9ft BGS	602.55				37.02		
	CL-CLAY, trace sand, stiff, low plasticity, slow dilatancy, fine sand, orange-brown, moist	601.85		1		19.07	093/094	8 - 10'
10	SM-SILTY SAND, trace gravel, dense, fine sand, fine gravel, non-plastic, slow dilatancy, orange-brown, moist					12.96		
				2		7.88	095	10 - 11.9'
12	- 2-inch fine and medium sand lense, trace coarse sand, fine gravel at 11.3ft BGS - Refusal, WG-128 at 11.9ft BGS END OF BOREHOLE @ 11.9ft BGS	598.85						
14								
16								
18								
20								
22								
24								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 13, 2020

CHEMICAL ANALYSIS



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STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: Genesis Development
PROJECT NUMBER: 11219347
CLIENT: Genesis Development, LLC
LOCATION: 1130 Niagara Street, Buffalo, NY

HOLE DESIGNATION: GP-8-1
DATE COMPLETED: 13 November 2020
DRILLING METHOD: HSA Split Spoon
FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	GAS PROBE	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1061982 EASTING: 1063201	GROUND SURFACE 615.23						
	CONCRETE	614.73						
2	SILT (FILL), trace gravel, compact, non-plastic, fine gravel, brown, moist, brick							
4								
6	SAND (FILL), loose, fine sand, tan, moist, brick	610.23				0.64		
	- rock fragments at 7.0ft BGS					0.64		
8	CLAY (FILL), low plasticity, slow dilatancy, red-brown, moist, brick pieces	607.23						
10	CL-CLAY, trace silt, trace gravel, very stiff, low plasticity, slow dilatancy, fine and coarse gravel, red-brown, dry to moist - 4-inch cobble lense at 10.3ft BGS	605.73		1		6.11	119/120	9.5 - 11'
12				2		6.25		
						5.23	121	11 - 13'
14				3		5.23		
						5.93	122	13 - 15'
16	SM-SILTY SAND, trace fine gravel, trace clay lenses, fine sand, non-plastic, red-brown, wet	600.73		4		8.74		
	- Refusal, WG-152/153 at 16.1ft BGS	599.13				13.4	123	15 - 16.1'
	END OF BOREHOLE @ 16.1ft BGS							
18								
20								
22								
24								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 16, 2020

CHEMICAL ANALYSIS ○

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STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: Genesis Development

HOLE DESIGNATION: GP-C-1

PROJECT NUMBER: 11219347

DATE COMPLETED: 16 November 2020

CLIENT: Genesis Development, LLC

DRILLING METHOD: HSA Macrocore/Split Spoon

LOCATION: 1130 Niagara Street, Buffalo, NY

FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	GAS PROBE	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1061961 EASTING: 1063270 GROUND SURFACE	615.17						
	CONCRETE	614.67						
	CLAY (FILL), trace silt, very stiff, medium plasticity, slow dilatancy, purple-brown, moist	613.67				5.43		
2	SAND (FILL), trace gravel, loose, fine sand, fine and coarse gravel, tan-brown, moist, rock					1.82		
						3.99		
4						8.57		
	SANDY CLAY (FILL), trace gravel, very stiff, low plasticity, slow dilatancy, fine sand, fine and coarse gravel, dark brown, moist, slight odor	611.17				4.39		
		610.17				10.68		
6	SILT AND CLAY (FILL), trace gravel, very stiff, low plasticity, fine gravel, orange-brown, moist	609.17				9.79		
	CL-CLAY, with silt, trace gravel, very stiff, low plasticity, slow dilatancy, fine gravel, red-brown, moist			1		11.75	140	6 - 8'
8	- some green-gray banding, very strong odor at 8.7ft BGS					2134.00		
				2		5782.00	141	8 - 10'
10	- trace silt, brown at 10.5ft BGS					1842.00		
				3		2086.00	142	10 - 12'
12						186.00		
				4		1501.00	143	12 - 14'
14						280.00		
	SP-SAND, trace silt, trace clay, dense, fine sand, non-plastic, light brown, some orange-brown, trace green-gray, moist	600.37		5		7.32	144/145	14 - 15.7'
16	- Refusal, WG-167 at 15.7ft BGS	599.57 599.47						
	SM-CLAYEY SAND, dense, low plasticity, fine sand, light brown and red-brown banding, moist							
18	END OF BOREHOLE @ 15.7ft BGS							
20								
22								
24								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 17, 2020

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STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: Genesis Development
PROJECT NUMBER: 11219347
CLIENT: Genesis Development, LLC
LOCATION: 1130 Niagara Street, Buffalo, NY

HOLE DESIGNATION: GP-14-1
DATE COMPLETED: 16 November 2020
DRILLING METHOD: HSA Split Spoon
FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	GAS PROBE	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1061982 EASTING: 1063294	GROUND SURFACE 614.94						
	CONCRETE	614.44				1.81		
	SAND (FILL), loose, fine grained, tan, moist					1.92		
2	- with clay, low plasticity at 2.0ft BGS					2.61		
	GRAVEL (FILL), medium and fine sand, brick	612.14				2.67		
4						3.61		
	SANDY-SILT (FILL), silt, trace clay, trace gravel, dense, low plasticity, dark brown, moist	610.24				5.53		
6						5.41		
	CL-CLAY, trace fine sand, stiff, medium plasticity, slow dilatancy, fine sand, light red-brown, trace yellow-green, moist	608.69		1		7.42	135	6 - 8'
8						2.48		
	- trace gravel, no sand at 9.1ft BGS			2		1.71	136	8 - 10'
10						3.15		
	- cobbles at 11.0ft BGS			3		1.44	137	10 - 12'
12						13.39		
				4		126.00	138	12 - 14'
14						12.63		
	ML-SILT, trace sand, compact, non-plastic, slow dilatancy, fine sand, light tan-brown, moist	600.64		5		6.81	139	14 - 15.8'
16	- Refusal, WG-168 at 15.8ft BGS	599.14						
	END OF BOREHOLE @ 15.8ft BGS							
18								
20								
22								
24								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 17, 2020

CHEMICAL ANALYSIS ○

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STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: Genesis Development

HOLE DESIGNATION: GP-19-1

PROJECT NUMBER: 11219347

DATE COMPLETED: 16 November 2020

CLIENT: Genesis Development, LLC

DRILLING METHOD: HSA Split Spoon/Macrocore

LOCATION: 1130 Niagara Street, Buffalo, NY

FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	GAS PROBE	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1061969 EASTING: 1063246	GROUND SURFACE 615.27						
	CONCRETE	614.77				4.27		
	CLAY (FILL), trace sand, very stiff, medium plasticity, slow dilatancy, fine sand, with medium sand, red-brown, dark brown, moist	614.37				4.30		
2	SAND (FILL), fine sand, loose, poorly graded, tan-brown, moist					2.71		
	- some coarse grained, trace fine gravel, black, brick pieces at 3.7ft BGS	611.27				3.32		
4	SAND (FILL), silt, with clay, trace gravel, dense, fine sand, with medium sand, fine gravel, some low plasticity, brown, tan-brown, some black	610.57				4.66		
6	FILL, brick, gravel, trace sand	609.57				12.62		
	CL-CLAY, with silt, trace gravel, very stiff, low plasticity, slow dilatancy, medium toughness, fine gravel, brown and red-brown, moist			1		16.49	129	6 - 8'
8	- silty clay, brown at 6.0ft BGS - gravelly clay at 7.4ft BGS - trace gravel at 7.9ft BGS					5.44		
				2		45.82	130	8 - 10'
10						7.54		
	SM-CLAYEY SAND, trace gravel, dense, low pasticity, fine sand, fine rounded gravel, light brown, moist	604.77		3		39.43	131	10 - 12'
12	CL-SILTY CLAY, trace gravel, trace sand, very stiff, low plasticity, slow dilatancy, fine sand, fine and coarse gravel, red-brown, moist	604.07				33.49		
	- 0.04-inch sand lense at 13.5ft BGS			4		39.02	132	12 - 14'
14						4417.00		
				5		843.00	133/134	14 - 16'
16	- Refusal, WG-155 at 16.0ft BGS END OF BOREHOLE @ 16.0ft BGS	599.27				834.8		
18								
20								
22								
24								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 17, 2020

CHEMICAL ANALYSIS

File: C:\USERS\CACHILDS\DESKTOP\11219347-MI.GPJ Library File: 11219347.GLB Report: OVERBURDEN LOG Date: 10/3/21



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: Genesis Development
PROJECT NUMBER: 11219347
CLIENT: Genesis Development, LLC
LOCATION: 1130 Niagara Street, Buffalo, NY

HOLE DESIGNATION: GP-23-1
DATE COMPLETED: 16 November 2020
DRILLING METHOD: HSA Split Spoon
FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	GAS PROBE	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1061970 EASTING: 1063309	GROUND SURFACE 615.08						
	CONCRETE	614.58						
2	SAND (FILL), fine grained, loose, tan-brown, moist					0.31		
						0.41		
						3.84		
4	- fine to medium sand, trace coarse sand, trace fine gravel, black, brick pieces at 2.7ft BGS	611.58				3.65		
	SILT (FILL), trace sand, compact, non-plastic, slow dilatancy, fine sand, dark brown, moist					4.12		
6	- with sand at 4.0ft BGS							
	CL-CLAY, trace sand, trace gravel, stiff, medium plasticity, slow dilatancy, fine sand, fine and coarse gravel, brown, some yellow-gray and cream banding, moist	609.08		1		4.33	146	6 - 8'
8	- no sand, red-brown, no coarse gravel at 8.0ft BGS					4.12		
				2		3.21	147/148	8 - 10'
10						3.30		
				3		3.26	149	10 - 12'
12	- trace medium tan sand at 11.7ft BGS					3.31		
				4		3.24	150	12 - 14'
14						3.50		
	SM-SILTY SAND, dense, fine sand, non-plastic, slow dilatancy, brown, moist	600.78		5		3.32	151	14 - 16.4'
16	CL-SILTY CLAY, trace gravel, very stiff, low plasticity, slow dilatancy, fine and coarse gravel, brown, dry to moist	600.18				3.69		
	ML-SILT, trace gravel, fine and coarse gravel, compact, non-plastic, slow dilatancy, purple brown, moist	599.18				3.90		
18	CL-SILTY CLAY, very stiff, low plasticity, slow dilatancy, purple brown, moist	598.98						
20	- Refusal, WG-175 at 16.4ft BGS	598.68						
	END OF BOREHOLE @ 16.4ft BGS							
22								
24								
26								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 17, 2020

CHEMICAL ANALYSIS



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STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

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PROJECT NAME: Genesis Development
PROJECT NUMBER: 11219347
CLIENT: Genesis Development, LLC
LOCATION: 1130 Niagara Street, Buffalo, NY

HOLE DESIGNATION: GP-24-1
DATE COMPLETED: 11 November 2020
DRILLING METHOD: HSA Split Spoon
FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	GAS PROBE	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1061953 EASTING: 1063203 GROUND SURFACE	615.17						
	CONCRETE							
	SILTY SAND (FILL), trace gravel, brown and black, moist	614.47						
	brick	614.17				0.06		
2	SAND (FILL), medium grained, tan-brown, trace black, moist	613.77				0.17		
	- brick, rock fragments, fine to coarse sand at 4.5ft BGS					0.01		
4								
	SILT (FILL), sand, gravel, compact, low plasticity, gray and gray-black, moist	609.67						
6								
	CL-CLAY, trace silt, trace gravel, very stiff, medium plasticity, slow dilatancy, fine gravel, red-orange brown, moist	608.17				0.10		
8				1		0.09	072	7 - 9'
	- no silt at 9.0ft BGS					0.57		
10				2		0.21	073	9 - 11'
						0.47		
12				3		0.22	074	11 - 13'
						9.68		
14				4		489.00	075	13 - 15'
	SP-SAND, trace silt, compact, fine sand, slow dilatancy, light brown, black, wet	600.57						
		599.77						
16	SM-SILTY SAND, with clay, compact, fine sand, low plasticity, slow dilatancy, red-brown, moist	599.07		5		19.68	076	15 - 16.1'
	- Refusal, WG-089 at 16.1ft BGS							
18	END OF BOREHOLE @ 16.1ft BGS							
20								
22								
24								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 12, 2020

CHEMICAL ANALYSIS ○

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STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

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PROJECT NAME: Genesis Development
PROJECT NUMBER: 11219347
CLIENT: Genesis Development, LLC
LOCATION: 1130 Niagara Street, Buffalo, NY

HOLE DESIGNATION: GP-30-1
DATE COMPLETED: 11 November 2020
DRILLING METHOD: HSA Split Spoon
FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	GAS PROBE	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1061953 EASTING: 1063296	GROUND SURFACE 615.05						
	CONCRETE	614.55						
2	SAND (FILL), medium grained, rapid dilatancy, tan-brown, moist					1.32		
	CLAY (FILL), trace gravel, silt, medium plasticity, slow dilatancy, dark brown, moist	612.80				0.6		
4	CLAYEY SILT (FILL), trace sand, trace gravel, fine sand and gravel, orange-red brown, moist	611.95				0.43		
	CL-CLAY, with silt, trace gravel, very stiff, fine gravel, red-brown, dry to moist	610.55		1		0.21	065	4.5 - 6'
6						0.24		
	- trace silt, gray and tan-orange banding at 7.0ft BGS			2		0.10	066	6 - 8'
8						0.15		
				3		0.3	067	8 - 10'
10						0.1		
	- 0.2-ft gravel layer at 10.7ft BGS			4		0.28	068	10 - 12'
12	- 0.2-ft coarse pink and black sand lense at 11.5ft BGS					0.20		
						0.10		
14	- 0.3-ft gravel layer at 13.6ft BGS			5		0.09	069	12 - 14'
						0.10		
16				6		0.37	070	14 - 16.5'
	SM-SILTY SAND, trace gravel, compact, fine sand and gravel, poorly graded, slow dilatancy, light purple brown, moist to wet	599.05 598.75						
18	- Refusal, WG-077 and WG-078 at 16.3ft BGS							
20	END OF BOREHOLE @ 16.3ft BGS							
22								
24								
26								
28								
30								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 11, 2020

CHEMICAL ANALYSIS ○

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STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

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PROJECT NAME: Genesis Development

HOLE DESIGNATION: GP-31-1

PROJECT NUMBER: 11219347

DATE COMPLETED: 10 November 2020

CLIENT: Genesis Development, LLC

DRILLING METHOD: HSA Macrocore/Split Spoon

LOCATION: 1130 Niagara Street, Buffalo, NY

FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	GAS PROBE	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1061936 EASTING: 1063218	GROUND SURFACE 615.06						
	CONCRETE	614.56				0.26		
	SILT (FILL), with sand, with clay, trace gravel, compact, fine sand, fine gravel, low plasticity, slow dilatancy, brown, some black, moist, ash	613.66				0.17		
2	SAND (FILL), fine grained, tan-brown, moist					0.56		
						0.84		
4		610.86				0.81		
	SILT (FILL), trace gravel, trace sand, fine sand, fine gravel, low plasticity, brown to light brown, moist					7.21		
6		609.06				6.34		
	CL-CLAY, very stiff, low plasticity, slow dilatancy, trace fine gravel, brown, dry to moist			1		4.71	043/044	6 - 8'
8						2.24		
				2		3.88	045	8 - 10'
10						1.57		
	- 1-inch gravel lense at 11.0ft BGS			3		1.52	046	10 - 12'
12						0.82		
				4		0.90	047	12 - 14'
14						1.20		
		600.06		5		1.90	048	14 - 16'
16	ML-SILT, trace sand, trace clay, non-plastic, slow dilatancy, light brown, moist							
	- Refusal, WG-049 at 16.3ft BGS	598.76						
	END OF BOREHOLE @ 16.3ft BGS							
18								
20								
22								
24								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 11, 2020

CHEMICAL ANALYSIS ○

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PROJECT NAME: Genesis Development

HOLE DESIGNATION: GP-33-1

PROJECT NUMBER: 11219347

DATE COMPLETED: 11 November 2020

CLIENT: Genesis Development, LLC

DRILLING METHOD: HSA Macrocore/Split Spoon

LOCATION: 1130 Niagara Street, Buffalo, NY

FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	GAS PROBE	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1061937 EASTING: 1063249 GROUND SURFACE	615.21						
	CONCRETE	614.71						
	SAND (FILL), fine grained, tan-brown, moist					1.13		
2						6.49		
	- black and tan-brown sand at 4.0ft BGS			1		0.46	051	3 - 5'
4		610.71				0.74		
	SILT (FILL), and sand, fine sand, trace medium sand, brown, concrete pieces	610.21				0.24		
6	CL-CLAY, very stiff, medium plasticity, slow dilatancy, medium toughness, red-brown, moist			2		12.31	052	5 - 7'
	- with silt, trace fine sand and coarse gravel, gray lenses at 7.0ft BGS	607.71				1.00		
8	CL-CLAY, very stiff, medium plasticity, slow dilatancy, medium toughness, red-brown, moist			3		0.16	053	7 - 9'
		605.71				0.51		
10	ML-CLAYEY SILT, dense, low plasticity, slow dilatancy, red-brown, moist			4		0.37	054	9 - 11'
	- 2-inch coarse gravel lense at 10.5ft BGS					0.39		
12	CL-SILTY CLAY, trace gravel, trace sand, very stiff, low plasticity, slow dilatancy, fine sand, fine gravel, red-brown, moist	603.21		5		0.41	055	11 - 13'
						0.64		
14				6		0.56	056	13 - 15'
	- no silt, sand or gravel at 15.0ft BGS					0.74	057	15 - 16.3'
16	SP-SAND, loose, fine grained, rapid dilatancy, light red-brown, wet	599.71		7				
	ML-SANDY SILT, compact, fine sand, non-plastic, light red-brown, moist to wet	599.21						
	- Refusal, WG-071 at 16.3ft BGS	598.91						
18	END OF BOREHOLE @ 16.3ft BGS							
20								
22								
24								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 11, 2020

CHEMICAL ANALYSIS ○

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PROJECT NAME: Genesis Development
PROJECT NUMBER: 11219347
CLIENT: Genesis Development, LLC
LOCATION: 1130 Niagara Street, Buffalo, NY

HOLE DESIGNATION: GP-35-1
DATE COMPLETED: 11 November 2020
DRILLING METHOD: HSA Split Spoon
FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	GAS PROBE	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1061938 EASTING: 1063282 GROUND SURFACE	615.24						
	CONCRETE	614.74						
2	SAND (FILL), medium grained, tan-brown, moist					0.91		
						0.60		
4	CLAYEY SILT (FILL), trace gravel, very dense, low plasticity, fine and coarse gravel, brown to red-brown, black banding throughout, moist	612.24				1.24		
		610.74		1		0.99	058	4.5 - 6'
6	CL-CLAY, with silt, trace gravel, very stiff, low plasticity, slow dilatancy, medium toughness, fine gravel, red-brown, moist					1.12		
						1.34		
8	CL-SILTY CLAY, trace gravel, trace sand, fine sand, fine and coarse gravel, red-brown, moist, iron staining throughout - 0.01-inch cream silt lense at 7.8ft BGS - 2-inch sand lense at 8.4ft BGS	608.24		2		1.10	059/060	6 - 8'
						0.22		
10				3		0.17	061	8 - 10'
						0.13		
12				4		0.01	062	10 - 12'
						0.50		
14				5		0.20	063	12 - 14'
						0.33		
16	- purple-brown at 15.4ft BGS - Refusal, WG-099 at 15.9ft BGS END OF BOREHOLE @ 15.9ft BGS	599.34		6		0.31	064	14 - 15.9'
18								
20								
22								
24								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 12, 2020

CHEMICAL ANALYSIS ○

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PROJECT NAME: Genesis Development
PROJECT NUMBER: 11219347
CLIENT: Genesis Development, LLC
LOCATION: 1130 Niagara Street, Buffalo, NY

HOLE DESIGNATION: GP-36
DATE COMPLETED: 17 November 2020
DRILLING METHOD: HSA Macrocore/Split Spoon
FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	GAS PROBE	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1061922 EASTING: 1063234	GROUND SURFACE 615.20						
	CONCRETE	614.70				0.50		
	CLAYEY SILT (FILL), trace sand, trace gravel, low plasticity, dark brown, moist	614.10				0.71		
2	SAND (FILL), fine grained, loose, tan-brown, moist					0.21		
4	- with coarse gravel at 4.7ft BGS					0.39		
						0.67		
6	CLAYEY SILT (FILL), trace fine sand, low plasticity, dark brown, moist	609.80 609.20				0.99		
8	CL-CLAY, trace silt, stiff, medium plasticity, slow dilatancy, medium toughness, red-brown, some orange-brown, moist - no silt, no orange-brown at 7.2ft BGS			1		0.57	162	6 - 8'
						0.90		
				2		0.57	163	8 - 10'
10						0.79		
				3		0.17	164	10 - 12'
12	- trace fine and coarse gravel at 12.0ft BGS					0.26		
						0.74		
14				4		0.64	165	12 - 14'
						0.74		
16	- Refusal, WG-176 at 15.7ft BGS END OF BOREHOLE @ 15.7ft BGS	599.50		5		0.71	166	14 - 15.7'
18								
20								
22								
24								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 17, 2020

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PROJECT NAME: Genesis Development

HOLE DESIGNATION: GP-37

PROJECT NUMBER: 11219347

DATE COMPLETED: 17 November 2020

CLIENT: Genesis Development, LLC

DRILLING METHOD: HSA Macrocore/Split Spoon

LOCATION: 1130 Niagara Street, Buffalo, NY

FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	GAS PROBE	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1061922 EASTING: 1063262 GROUND SURFACE	615.31						
	CONCRETE	614.81				0.64		
2	SAND (FILL), loose, fine grained, tan-brown, moist					1.28		
						0.34		
4	- trace fine gravel, trace silt, dark brown at 3.8ft BGS	611.31		1		0.36		
	ML-SILT (FILL), with clay, trace sand, trace gravel, low plasticity, some non-plastic, fine sand, fine gravel, brown-black, moist	610.11				22.04	156	4 - 5'
6	CL-CLAY, very stiff, low plasticity, slow dilatancy, trace fine gravel, orange-red brown, moist					1.26		
	- red-brown at 6.0ft BGS			2		0.65		
8	- 0.1ft coarse gravel at 6.7ft BGS					4.14	157	6 - 8'
	- some black, orange-yellow and cream, medium plasticity at 7.8ft BGS					0.99		
	- red-brown at 8.3ft BGS			3		0.78	158	8 - 10'
10	- trace silt at 9.8ft BGS					0.30		
	- trace coarse and fine gravel at 10.0ft BGS			4		0.29	159	10 - 12'
12						0.60		
				5		0.29	160	12 - 14'
14						0.22		
	- Refusal, WG-178 at 15.1ft BGS	600.21		6			161	14 - 15.1'
16	END OF BOREHOLE @ 15.1ft BGS							
18								
20								
22								
24								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 18, 2020

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STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

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PROJECT NAME: Genesis Development
PROJECT NUMBER: 11219347
CLIENT: Genesis Development, LLC
LOCATION: 1130 Niagara Street, Buffalo, NY

HOLE DESIGNATION: GP-38
DATE COMPLETED: 13 November 2020
DRILLING METHOD: HSA Split Spoon
FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	GAS PROBE	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1061939 EASTING: 1063187 GROUND SURFACE	615.13						
	CONCRETE	614.63				1.27		
	SILTY CLAY (FILL), soft, low plasticity, slow dilatancy, medium toughness, red-brown, some brown-black	613.73				1.56		
2	SAND (FILL), loose, fine sand, tan-brown, moist - brick from 2.8 to 3.2ft BGS	611.93				1.54		
4	SILTY SAND (FILL), compact, fine to medium sand, fine and coarse gravel, dark brown, moist, brick throughout	609.13				1.37		
						2.16		
6						2.61		
	SILT (FILL), with sand, compact, low plasticity, fine sand, brown, moist, brick and concrete pieces	609.13				2.44		
8						2.90		
	CL-CLAY, very stiff, trace gravel, low plasticity, slow dilatancy, fine gravel, tan-brown, moist - medium plasticity at 10.0ft BGS - low plasticity at 10.9ft BGS	606.63		1		2.28	102	8.5 - 10'
10						2.12		
				2		2.22	103/104	10 - 12'
12						2.22		
	- trace silt, trace fine tan-orange sand at 13.0ft BGS			3		2.34	105	12 - 14'
14						2.37		
	SM-SILTY SAND, loose, fine sand, poorly graded, non-plastic, brown, wet - with clay, low plasticity at 15.6ft BGS - Refusal, WG-115 at 16.2ft BGS END OF BOREHOLE @ 16.2ft BGS	600.23		4		2.08	106	14 - 16.2'
16		598.93				2.43		
18								
20								
22								
24								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 13, 2020

CHEMICAL ANALYSIS ○

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PROJECT NAME: Jenesis Development
PROJECT NUMBER: 11219347
CLIENT: Jenesis Development, LLC
LOCATION: 1130 Niagara Street, Buffalo, NY

HOLE DESIGNATION: GP-39
DATE COMPLETED: 13 November 2020
DRILLING METHOD: HSA Split Spoon
FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	GAS PROBE	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1061953 EASTING: 1063174 GROUND SURFACE	615.19						
	CONCRETE	614.69				23.67		
	SILT (FILL), with sand, trace gravel, compact, fine sand, fine gravel, brown and black, moist, brick pieces, strong odor	613.19				2.08		
2	SAND (FILL), trace gravel, loose, fine sand, tan					1.69		
4	- coarse gravel, brown-black, moist at 4.0ft BGS - no gravel, tan at 4.6ft BGS - brick at 5.6ft BGS - with silt at 6.6ft BGS					1.71 1.73 1.03 2.51		
6		608.19				1.14		
8	SANDY SILT (FILL), dense, low plasticity, trace gravel, fine sand, fine gravel, dark brown, moist	606.69						
10	CL-CLAY, trace silt, trace sand, trace gravel, very stiff, low plasticity, fine sand and gravel, light red-brown, moist			1		1.70 1.10	107	9 - 11'
12				2		0.71 2.53	108	11 - 13'
14				3		1.22 1.12	109	13 - 15'
16	SM-SAND, with silt, loose to compact, trace gravel, fine sand, fine gravel, non-plastic, tan red-brown, moist - Refusal, WG-124 at 15.9ft BGS END OF BOREHOLE @ 15.9ft BGS	599.89 599.29		4		3.02	110	15 - 15.9'
18								
20								
22								
24								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 13, 2020

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PROJECT NAME: Genesis Development
PROJECT NUMBER: 11219347
CLIENT: Genesis Development, LLC
LOCATION: 1130 Niagara Street, Buffalo, NY

HOLE DESIGNATION: GP-40
DATE COMPLETED: 10 November 2020
DRILLING METHOD: HSA Macrocore/Split Spoon
FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	GAS PROBE	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1061953 EASTING: 1063323	GROUND SURFACE 615.16						
	CONCRETE	614.66				7.08		
	SP-SAND (FILL), loose to compact, fine sand, poorly graded, rapid dilatancy, light gray brown grading to tan brown					1.95		
2						1.64		
	- medium to coarse sand, orange-red at 2.8ft BGS	612.16				0.92		
4	CL-CLAY (FILL), stiff, low plasticity, slow dilatancy, medium toughness, red-brown	611.16				3.60		
	SP-SAND (FILL), trace gravel, fine sand, fine gravel, rapid dilatancy, light brown, moist	610.36				1.04		
6	CL-CLAY, very stiff, low plasticity, slow dilatancy, medium toughness, trace fine gravel, subangular, red-brown, moist			1		1.25	034	5 - 7'
						1.25		
8				2		1.16	035	7 - 9'
						0.73		
10				3		1.09	036	9 - 11'
	- 0.02ft sand lense, green-gray at 15ft BGS					0.81		
12				4		3.81	038	11 - 13'
						1.18		
14				5		2.01	042	13 - 15.4'
16	ML-SILT, dense, non-plastic, slow dilatancy, light brown, dry to moist - Refusal, WG-050 at 15.5ft BGS END OF BOREHOLE @ 15.5ft BGS	600.16 599.69						
18								
20								
22								
24								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

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CHEMICAL ANALYSIS ○

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STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

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PROJECT NAME: Genesis Development
PROJECT NUMBER: 11219347
CLIENT: Genesis Development, LLC
LOCATION: 1130 Niagara Street, Buffalo, NY

HOLE DESIGNATION: GP-42
DATE COMPLETED: 13 November 2020
DRILLING METHOD: HSA Split Spoon
FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	GAS PROBE	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1061969 EASTING: 1063159	GROUND SURFACE 615.15						
	CONCRETE							
2	SILTY SAND (FILL), gravel, compact, fine sand, fine gravel, some low plasticity, tan and gray-black, moist, ash, brick	614.25 613.15				0.60		
4	SAND (FILL), loose, fine sand, tan-brown, moist					0.42		
6	- ash from 5.7 to 5.9ft BGS - brick from 5.9 to 7.0ft BGS					0.15		
						0.19		
						1.07		
						0.20		
8	SAND (FILL), trace gravel, compact, coarse and medium sand, fine gravel, brown, moist, brick pieces	608.15				0.18		
						0.23		
10	CL-CLAY, trace gravel, very stiff, medium plasticity, slow dilatancy, medium toughness, coarse angular gravel, red-brown, moist	606.35 605.65		1		0.53	111	9 - 11'
	ML-SILT, trace sand, compact, non-plastic, slow dilatancy, fine sand, dark brown grading to light brown, moist	604.35				0.42		
12	CL-CLAY, with silt, trace gravel, very stiff, low plasticity, slow dilatancy, fine and coarse gravel, red-orange brown, moist - medium plasticity, trace silt at 11.8ft BGS			2		0.32	112	11 - 13'
						0.03		
14				3		0.23	113	13 - 15'
						0.26		
16	- Refusal at 16.4ft BGS END OF BOREHOLE @ 16.4ft BGS	598.75		4		0.40	114	15 - 16.4'
18								
20								
22								
24								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



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STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

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PROJECT NAME: Genesis Development
PROJECT NUMBER: 11219347
CLIENT: Genesis Development, LLC
LOCATION: 1130 Niagara Street, Buffalo, NY

HOLE DESIGNATION: GP-44
DATE COMPLETED: 13 November 2020
DRILLING METHOD: HSA Split Spoon
FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	GAS PROBE	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1061983 EASTING: 1063175	GROUND SURFACE 614.93						
	CONCRETE	614.43						
	SILT (FILL), with sand, low plasticity, slow dilatancy, fine sand, dark brown, moist	613.93				1.97		
	SAND (FILL), loose, fine sand, tan, moist	613.73				1.99		
2	FILL, brick, 3-inch cobble lense at 10.0ft BGS							
4								
6						2.56		
8						2.53		
10						1.85		
12	SANDY SILT (FILL), silt, trace clay, compact, low plasticity, fine sand, tan, black and light brown, moist, brick throughout	604.93				1.83		
						1.72		
14	CL-CLAY, trace silt, stiff, medium plasticity, slow dilatancy, red-brown, moist	602.93		1		1.67	116	12 - 14'
						2.69		
16	- silty clay at 14.9ft BGS			2		1.84	117	14 - 15.6'
						1.87		
18	ML-SILT, compact, non-plastic, slow dilatancy, red-brown, wet	599.33		3			118	15.6-15.8'
20	- Refusal, WG-154 at 15.8ft BGS	599.13						
22	END OF BOREHOLE @ 15.8ft BGS							
24								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 17, 2020

CHEMICAL ANALYSIS

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PROJECT NAME: Genesis Development
PROJECT NUMBER: 11219347
CLIENT: Genesis Development, LLC
LOCATION: 1130 Niagara Street, Buffalo, NY

HOLE DESIGNATION: GP-45
DATE COMPLETED: 10 November 2020
DRILLING METHOD: HSA Macrocore/Split Spoon
FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	GAS PROBE	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1061981 EASTING: 1063324 GROUND SURFACE	615.09						
	CONCRETE	614.49				0.92		
	SAND (FILL), loose, fine grained, tan-brown, moist	613.59				1.04		
2	CLAY (FILL), with silt, trace gravel, very stiff, medium plasticity, slow dilatancy, red brown, black, roof shingle pieces throughout	612.09						
4	No Recovery	610.09						
6	CL-CLAY, very stiff, medium plasticity, slow dilatancy, medium toughness, light brown, moist	606.09		1		0.53		
8						0.57		
						1.16		
						0.91		
10	- WG-041 at 9.0ft BGS END OF BOREHOLE @ 9.0ft BGS						029	6 - 8"
12								
14								
16								
18								
20								
22								
24								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 10, 2020

CHEMICAL ANALYSIS

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STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

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PROJECT NAME: Genesis Development

HOLE DESIGNATION: GP-45A

PROJECT NUMBER: 11219347

DATE COMPLETED: 10 November 2020

CLIENT: Genesis Development, LLC

DRILLING METHOD: HSA Macrocore/Split Spoon

LOCATION: 1130 Niagara Street, Buffalo, NY

FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	GAS PROBE	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1061983 EASTING: 1063323 GROUND SURFACE	615.07						
2								
4								
6								
8								
10	CL-CLAY, very stiff, medium plasticity, slow dilatancy, red-light brown	606.07		1		1.04	030	9 - 11'
12				2		0.86	031/033	11 - 13'
14	SM-SAND, with silt, fine sand, loose, slow dilatancy, light brown, moist	601.47		3		0.69	032	13 - 15.3'
16	- Refusal at 15.3ft BGS END OF BOREHOLE @ 15.3ft BGS	599.77				0.79		
18								
20								
22								
24								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



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STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

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PROJECT NAME: Genesis Development
PROJECT NUMBER: 11219347
CLIENT: Genesis Development, LLC
LOCATION: 1130 Niagara Street, Buffalo, NY

HOLE DESIGNATION: GP-47
DATE COMPLETED: 12 November 2020
DRILLING METHOD: HSA Split Spoon
FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	GAS PROBE	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1061999 EASTING: 1063160 GROUND SURFACE	603.40						
2	SM-SAND (FILL), with silt, trace gravel, fine to medium sand, fine and coarse gravel, few cobbles, brown-brown black, moist, brick pieces							
4	- Refusal at 4.6ft BGS END OF BOREHOLE @ 4.6ft BGS	598.80		1		6.04	181/182	2.8-4.6'
6								
8								
10								
12								
14								
16								
18								
20								
22								
24								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS





STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

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PROJECT NAME: Genesis Development
PROJECT NUMBER: 11219347
CLIENT: Genesis Development, LLC
LOCATION: 1130 Niagara Street, Buffalo, NY

HOLE DESIGNATION: GP-48
DATE COMPLETED: 12 November 2020
DRILLING METHOD: HSA Split Spoon
FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	GAS PROBE	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1062001 EASTING: 1063195 GROUND SURFACE	605.07						
2	SAND (FILL), trace silt, trace gravel, fine to medium sand, trace coarse sand, fine to coarse gravel, brown, moist, brick, concrete - wet, no concrete at 4.0ft BGS - rock, wet from 5.0 to 5.8ft BGS - Refusal, WG-125 at 5.8ft BGS END OF BOREHOLE @ 5.8ft BGS	599.27				2.60	183	4 - 5.4'
						5.39		
						8.37		
						1.72		
						2.0		
4				1				
6								
8								
10								
12								
14								
16								
18								
20								
22								
24								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 13, 2020

CHEMICAL ANALYSIS ○

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PROJECT NAME: Genesis Development
PROJECT NUMBER: 11219347
CLIENT: Genesis Development, LLC
LOCATION: 1130 Niagara Street, Buffalo, NY

HOLE DESIGNATION: GP-49
DATE COMPLETED: 12 November 2020
DRILLING METHOD: HSA Split Spoon
FIELD PERSONNEL: Doug Oscar

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	GAS PROBE	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1061998.38 EASTING: 1063337.89	GROUND SURFACE 615.00						
	SAND AND GRAVEL (FILL), some silt, gray and brown	614.60				1.04		
	SAND (FILL), fine to medium grained, some silt, brown	613.80				0.43		
2	SILT (FILL), some fine sand, medium to coarse gravel, dark brown					0.55		
						0.57		
4	SILT (FILL), some clay, fine to medium gravel, black to red-brown	611.00				2.23		
						1.76		
6						0.59		
	SILT, some clay, fine sand, trace fine gravel, dark brown	608.20				0.48		
8						1.02		
				1		1.18	203	8' - 10'
10	SILT, little clay, trace fine sand, fine gravel, brown to red-brown	605.00				0.48		
				2		0.65	204	10' - 12'
12	- rock fragments, gray, dry from 12.6 to 14.0ft BGS					0.50		
				3		10.6	205	12' - 14'
14	SILT, some fine sand, little clay, fine to medium gravel, dense	601.00						
				4			206/207	14' - 16.3'
16	- WG-214 at 16.3ft BGS END OF BOREHOLE @ 16.3ft BGS	598.70						
18								
20								
22								
24								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 12, 2020

CHEMICAL ANALYSIS ○

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PROJECT NAME: Genesis Development
PROJECT NUMBER: 11219347
CLIENT: Genesis Development, LLC
LOCATION: 1130 Niagara Street, Buffalo, NY

HOLE DESIGNATION: GP-50
DATE COMPLETED: 12 November 2020
DRILLING METHOD: HSA Split Spoon
FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	GAS PROBE	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1062013 EASTING: 1063175 GROUND SURFACE	603.11						
2	SP-SAND (FILL), trace silt, trace gravel, fine to medium sand, fine and coarse gravel, tan, moist - concrete and brick from 1.1 to 2.0ft BGS	601.11				0.20		
						0.65		
4	SP-SAND (FILL), trace gravel, compact, fine sand, trace medium sand, fine and coarse gravel, brown-gray, moist - rock from 3.5 to 4.0ft BGS	599.11				10.75		
		598.51		1		59.60	081	4 - 4.6'
6	SM-SILTY SAND, trace gravel, compact, fine sand, fine and coarse gravel, slow dilatancy, non-plastic, black to gray-black, moist, moderate odor - no coarse gravel, gray, light brown at 4.3ft BGS - Refusal, WG-088 at 4.6ft BGS END OF BOREHOLE @ 4.6ft BGS							
8								
10								
12								
14								
16								
18								
20								
22								
24								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 12, 2020

CHEMICAL ANALYSIS ○

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PROJECT NAME: Genesis Development

HOLE DESIGNATION: GP-51

PROJECT NUMBER: 11219347

DATE COMPLETED: 10 November 2020

CLIENT: Genesis Development, LLC

DRILLING METHOD: HSA Macrocore/Split Spoon

LOCATION: 1130 Niagara Street, Buffalo, NY

FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	GAS PROBE	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1062016 EASTING: 1063322	GROUND SURFACE 611.09						
	ASPHALT	610.69				0.4		
	SAND (FILL), gravel, dense, medium to coarse sand, fine and coarse gravel, gray, light brown, moist, concrete	609.89				0.85		
2	SILT (FILL), dense, low plasticity, slow dilatancy, brown, black, moist, asphalt pieces, brick pieces	609.09		1		0.27	022	2 - 4'
4	CL-SILTY CLAY, trace gravel, stiff, low plasticity, slow dilatancy, medium toughness, fine gravel, light brown, some red-brown, moist			2		0.31		
						0.49	023	4 - 6'
6	- rock pieces at 6.5ft BGS					0.69		
	- red-brown with dark brown at 7.0ft BGS			3		0.64	024	6 - 8'
8	- trace fine and medium sand at 8.0ft BGS					0.27		
				4		1.44	025/026	8 - 10'
10						0.83		
	SP-SAND, trace silt, trace gravel, dense, fine sand, fine gravel, tan-brown to light brown	600.59		6		1.12	028	10 - 11.5'
	- gravel lense at 11.0ft BGS			5			027	10 - 12.3'
12	- Refusal, WG-040 at 12.3ft BGS	598.79				1.70		
	END OF BOREHOLE @ 12.3ft BGS							
14								
16								
18								
20								
22								
24								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 10, 2020

CHEMICAL ANALYSIS ○

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PROJECT NAME: Genesis Development
PROJECT NUMBER: 11219347
CLIENT: Genesis Development, LLC
LOCATION: 1130 Niagara Street, Buffalo, NY

HOLE DESIGNATION: GP-52
DATE COMPLETED: 12 November 2020
DRILLING METHOD: HSA Split Spoon
FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	GAS PROBE	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1062031 EASTING: 1063164	GROUND SURFACE 601.52						
	CONCRETE, and brick					2.24		
	SP-SAND (FILL), trace gravel, compact, fine and medium sand, coarse gravel, brown-black, moist	600.72				2.12		
2	CL-CLAY, stiff, low plasticity, slow dilatancy, medium toughness, light brown, moist	599.52				2.71		
	SANDY CLAY, fine grained, light brown and red-brown	598.42		1		2.28	079/080	2 - 4'
4	SM-SILTY SAND, compact, fine sand, slow dilatancy, poorly graded, light brown, moist to wet	597.72						
	- Refusal, WG-087 at 4.4ft BGS	597.12						
6	END OF BOREHOLE @ 4.4ft BGS							
8								
10								
12								
14								
16								
18								
20								
22								
24								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 12, 2020

CHEMICAL ANALYSIS ○

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PROJECT NAME: Genesis Development
PROJECT NUMBER: 11219347
CLIENT: Genesis Development, LLC
LOCATION: 1130 Niagara Street, Buffalo, NY

HOLE DESIGNATION: GP-53
DATE COMPLETED: 12 November 2020
DRILLING METHOD: HSA Split Spoon
FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	GAS PROBE	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1062033 EASTING: 1063193	GROUND SURFACE 603.55						
2	SP-SAND (FILL), trace silt, trace gravel, compact, fine to medium sand, trace coarse sand, fine and coarse gravel, brown, moist, brick and concrete - 0.2-ft brick at 1.1ft BGS					1.42		
						2.10		
	CL-CLAY, very stiff, low plasticity, slow dilatancy, tan-brown, moist - trace coarse gravel at 3.2ft BGS	601.35		1		0.67	082	2 - 4'
		600.15				40.92		
4	ML-SILT, trace sand, compact, non-plastic, fine sand, slow dilatancy, light brown, trace gray-black, moist	599.55				5.28		
	SM-SILTY SAND, trace gravel, loose to compact, fine and coarse sand, fine gravel, light brown, moist to wet	598.55		2			083	4 - 5.6'
		597.95		3		2.65	084	5 - 5.6'
6	ML-SANDY SILT, dense, non-plastic, slow dilatancy, fine sand, trace medium sand, fine gravel, light brown, moist to wet - Refusal, WG-126 at 5.6ft BGS							
8	END OF BOREHOLE @ 5.6ft BGS							
10								
12								
14								
16								
18								
20								
22								
24								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 13, 2020

CHEMICAL ANALYSIS ○

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PROJECT NAME: Genesis Development
PROJECT NUMBER: 11219347
CLIENT: Genesis Development, LLC
LOCATION: 1130 Niagara Street, Buffalo, NY

HOLE DESIGNATION: GP-54
DATE COMPLETED: 12 November 2020
DRILLING METHOD: HSA Split Spoon
FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	GAS PROBE	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1062031 EASTING: 1063223 GROUND SURFACE	604.76						
2	SAND (FILL), compact, medium to coarse sand, fine to coarse gravel, brown, moist, brick, concrete - wood, black from 1.7 to 2.5ft BGS					1.91		
						2.57		
4	CL-CLAY, trace sand, trace gravel, very stiff, low plasticity, slow dilatancy, fine sand, fine rounded gravel, light brown with orange staining, dry to moist	602.26		1		3.49	085	2.5 - 4'
						3.51		
	SM-SILTY SAND, trace gravel, compact, fine sand, trace medium sand, fine gravel, light brown, some brown-black, moist - Refusal, WG-096 at 5.2ft BGS END OF BOREHOLE @ 5.2ft BGS	600.26 599.56		2		0.52	086	4 - 5.2'
						6.61		
6								
8								
10								
12								
14								
16								
18								
20								
22								
24								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 12, 2020

CHEMICAL ANALYSIS ○

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PROJECT NAME: Genesis Development
PROJECT NUMBER: 11219347
CLIENT: Genesis Development, LLC
LOCATION: 1130 Niagara Street, Buffalo, NY

HOLE DESIGNATION: GP-55
DATE COMPLETED: 12 November 2020
DRILLING METHOD: HSA Split Spoon
FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	GAS PROBE	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1062031 EASTING: 1063253 GROUND SURFACE	606.21						
2	SAND (FILL), gravel, fine to medium sand, fine and coarse gravel, compact, brown grading to light brown, moist, brick throughout					2.46		
						2.33		
						2.73		
4	- coarse sand, fine gravel, wet at 3.8ft BGS					3.29		
						3.85		
6	SAND AND GRAVEL (FILL), compact, coarse sand, coarse and fine gravel, trace fine and medium sand, dark brown, some black, moist - wet, WG-097 at 6.0ft BGS - Refusal at 6.6ft BGS END OF BOREHOLE @ 6.6ft BGS	601.21 599.61		1		15.97 3.01	184	5 - 6.6'
8								
10								
12								
14								
16								
18								
20								
22								
24								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 12, 2020

CHEMICAL ANALYSIS



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PROJECT NAME: Genesis Development
PROJECT NUMBER: 11219347
CLIENT: Genesis Development, LLC
LOCATION: 1130 Niagara Street, Buffalo, NY

HOLE DESIGNATION: GP-56
DATE COMPLETED: 12 November 2020
DRILLING METHOD: HSA Split Spoon
FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	GAS PROBE	SAMPLE						
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval		
	NORTHING: 1062033 EASTING: 1063282 GROUND SURFACE	608.52								
2	SAND (FILL), with gravel, compact, fine to coarse grained, fine and coarse gravel, brown, moist, brick					1.49	100	8 - 10'		
						2.31				
						3.29				
4						14.27				
						4.11				
6	ML-SANDY SILT (FILL), trace gravel, dense, fine sand, fine gravel, brown, moist to wet, brick and metal pieces	602.52				67.58				
		600.82				57.88				
8						18.47				
	CL-CLAY, trace gravel, very stiff, low plasticity, slow dilatancy, medium toughness, fine subrounded gravel, orange-brown, dry to moist	600.82				6.19				
		599.52		1		4.20				
10	SM-SAND, with silt, compact, fine sand, poorly graded, non-plastic, tan, wet - trace clay, low plasticity at 9.8ft BGS - medium sand, with fine sand at 10.0ft BGS - Refusal, WG-127 at 10.6ft BGS	597.92			2			12.78	101	10 - 10.6'
12										
14	END OF BOREHOLE @ 10.6ft BGS									
16										
18										
20										
22										
24										

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 13, 2020

CHEMICAL ANALYSIS ○

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PROJECT NAME: Genesis Development
PROJECT NUMBER: 11219347
CLIENT: Genesis Development, LLC
LOCATION: 1130 Niagara Street, Buffalo, NY

HOLE DESIGNATION: GP-57
DATE COMPLETED: 9 November 2020
DRILLING METHOD: HSA Macrocore/Split Spoon
FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	GAS PROBE	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1062033 EASTING: 1063312 GROUND SURFACE	610.88						
2	SAND (FILL), gravel, silt, loose to dense, fine and coarse sand, fine and coarse gravel, brown, gray black, moist to dry - asphalt at 1.4ft BGS - no asphalt at 1.8ft BGS	608.88				1.50		
						1.09		
	CL-CLAY, trace gravel, very stiff, low plasticity, low dilatancy, medium toughness, brown, moist	606.88		1		1.30	017	2 - 4'
						1.09		
4	SM-CLAYEY SAND, compact, fine sand, trace medium sand, fine gravel, low plasticity, black, moist, slight odor	606.88		2		1.39	018	4 - 6'
						1.48		
6	SP-SAND, trace gravel, medium sand, loose, with fine sand, coarse gravel, brown, moist	605.38				1.32		
				3		2.31	019	6 - 8'
8	CL-CLAY, trace sand, very stiff, medium plasticity, slow dilatancy, medium toughness, brown, some gray brown, moist	603.88				71.84		
				4		28.32	020	8 - 10'
10	ML-CLAYEY SILT, compact, low plasticity, slow dilatancy, dark brown, moist	601.18		5		4.74	021	10 - 11.5'
	- no clay, light brown at 11.0ft BGS - Refusal, WG-039 at 11.5ft BGS	599.38				0.55		
12	END OF BOREHOLE @ 11.5ft BGS							
14								
16								
18								
20								
22								
24								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 10, 2020

CHEMICAL ANALYSIS ○

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STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: Genesis Development
PROJECT NUMBER: 11219347
CLIENT: Genesis Development, LLC
LOCATION: 1130 Niagara Street, Buffalo, NY

HOLE DESIGNATION: GP-58
DATE COMPLETED: 24 November 2020
DRILLING METHOD: HSA Split Spoon
FIELD PERSONNEL: Doug Oscar

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	GAS PROBE	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1062033.11 EASTING: 1063341.89	GROUND SURFACE 610.56						
	GRAVEL (FILL), coarse grained, some sand, black	609.56				0.95		
	CLAY (FILL), some silt, little sand, fine to medium gravel, dark gray	608.56				15.34		
2	CLAY (FILL), some silt and sand, little gravel, dark gray to dark brown	606.06				4.76		
4						9.08		
	CLAY (FILL), with some silt and sand, trace debris, dark brown	603.66				3.54		
6						82.46		
	CLAY, some silt, trace fine sand, fine gravel, brown	603.66				15.48		
8	- brown-gray at 8.0ft BGS			1		7.85	200	6.9' - 8'
						2.66		
				2		2.04	201	8' - 10'
10						1.13		
	SILT, some fine sand, little clay, little fine to medium gravel, brown	599.96		3		5.24	202	10' - 11.6'
12		598.96						
	END OF BOREHOLE @ 11.6ft BGS							
14								
16								
18								
20								
22								
24								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



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STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: Genesis Development
PROJECT NUMBER: 11219347
CLIENT: Genesis Development, LLC
LOCATION: 1130 Niagara Street, Buffalo, NY

HOLE DESIGNATION: GP-59
DATE COMPLETED: 9 November 2020
DRILLING METHOD: HSA Macrocore
FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	GAS PROBE	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1062047 EASTING: 1063178	GROUND SURFACE 602.18						
2	SAND (FILL), with gravel, with silt, fine sand with coarse sand, fine gravel, moist	601.18		1		2.76	003	0 - 2'
	CLAYEY SILT (FILL), low plasticity, slow dilatancy, tan-yellow, moist	600.88						
4	GRAVELLY SAND (FILL), fine and medium grained, trace coarse sand, fine gravel, brown and gray, moist	599.18		2		3.02	001	3 - 4'
	CL-CLAY, trace silt, trace sand, low plasticity, slow dilatancy, medium toughness, brown, some orange-red sand, moist			3		7.63	002	4 - 4.9'
	- Refusal at 4.9ft BGS	597.28				5.07		
	END OF BOREHOLE @ 4.9ft BGS							
6								
8								
10								
12								
14								
16								
18								
20								
22								
24								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

GRAIN SIZE ANALYSIS

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STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: Genesis Development
PROJECT NUMBER: 11219347
CLIENT: Genesis Development, LLC
LOCATION: 1130 Niagara Street, Buffalo, NY

HOLE DESIGNATION: GP-60
DATE COMPLETED: 9 November 2020
DRILLING METHOD: HSA Macrocore
FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	GAS PROBE	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1062046 EASTING: 1063208	GROUND SURFACE 603.22						
	SAND (FILL), clay, gravel, fine grained, tan-orange	602.62						
	CONCRETE	602.22						
2	CL-CLAY, with silt, very stiff, low plasticity, slow dilatancy, medium tough, dark brown, little red-brown					2.8		
4	- 2-inch gravel lense, coarse gravel at 2.5ft BGS - 0.5-inch light green-yellow clay at 3.8ft BGS			1		2.8	004	2 - 4'
	- Refusal at 4.9ft BGS	598.32		2		2.47	005	4 - 4.9'
	END OF BOREHOLE @ 4.9ft BGS							
6								
8								
10								
12								
14								
16								
18								
20								
22								
24								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



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STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: Genesis Development
PROJECT NUMBER: 11219347
CLIENT: Genesis Development, LLC
LOCATION: 1130 Niagara Street, Buffalo, NY

HOLE DESIGNATION: GP-61
DATE COMPLETED: 9 November 2020
DRILLING METHOD: HSA Macrocore
FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	GAS PROBE	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1062045 EASTING: 1063238 GROUND SURFACE	604.81						
2	SAND (FILL), with gravel, with silt, fine to medium grained sand, fine angular gravel, brown, moist - brick at 1.0ft BGS - medium black sand at 1.8ft BGS	602.81				1.52		
4	CL-CLAY, stiff, low plasticity, slow dilatancy, medium toughness, dark brown, moist - trace gravel lense, fine at 3.2ft BGS	600.81 600.31		1		3.47	006	2 - 4'
6	SP-SAND, trace gravel, compact, medium to fine sand, trace coarse sand, fine gravel, brown, wet, brick pieces			2		0.87 10.87	007	4 - 6'
8	CL-SILTY CLAY, trace fine gravel, stiff, low plasticity, slow dilatancy, medium toughness, fine subrounded gravel, brown, orange-brown, red, brown, moist - wet, WG-009 from 6.0 to 6.5ft BGS - Refusal at 6.5ft BGS END OF BOREHOLE @ 6.5ft BGS	598.31		3		2.87 1.82	008	6 - 6.5'
10								
12								
14								
16								
18								
20								
22								
24								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 9, 2020

CHEMICAL ANALYSIS ○

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STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: Genesis Development

HOLE DESIGNATION: GP-62

PROJECT NUMBER: 11219347

DATE COMPLETED: 9 November 2020

CLIENT: Genesis Development, LLC

DRILLING METHOD: HSA Macrocore

LOCATION: 1130 Niagara Street, Buffalo, NY

FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	GAS PROBE	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1062045 EASTING: 1063269	GROUND SURFACE	607.16					
2	SAND AND GRAVEL (FILL), trace silt, compact to dense, fine to coarse grained, fine gravel, brown and gray-brown, moist - 6-inches of concrete at 0.5ft BGS - brick pieces at 2.0ft BGS	603.16				1.82		
						1.88		
						1.73		
4	SP-SAND (FILL), trace silt, trace gravel, compact, fine to medium grained, fine gravel, subrounded, brown, moist, slight odor - black, strong odor at 5.7ft BGS	601.16		1		3.03	010	4 - 6'
6	CL-CLAY, trace gravel, very stiff, medium plasticity, slow dilatancy, medium toughness, fine gravel, dark brown, moist, slight odor	599.36		2		137.00	011	6 - 8'
8	SM-SILTY SAND, with clay, trace gravel, compact, fine sand, trace medium, fine gravel, poorly graded, some low plasticity, yellow-tan to brown, moist	598.66		3		14.93		
10	CL-CLAY, with sand, trace gravel, stiff, low plasticity, slow dilatancy, fine sand, fine and coarse gravel, dark brown, moist, slight odor - Refusal, WG-037 at 9.7ft BGS END OF BOREHOLE @ 9.7ft BGS	597.46				16.77	012	8 - 9.7'
						17.62		
12								
14								
16								
18								
20								
22								
24								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 10, 2020

CHEMICAL ANALYSIS

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STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: Genesis Development
PROJECT NUMBER: 11219347
CLIENT: Genesis Development, LLC
LOCATION: 1130 Niagara Street, Buffalo, NY

HOLE DESIGNATION: GP-63
DATE COMPLETED: 9 November 2020
DRILLING METHOD: HSA Macrocore
FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	GAS PROBE	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1062043 EASTING: 1063299	GROUND SURFACE	609.11					
2	SAND (FILL), gravel, trace silt, compact, fine to medium sand, fine and coarse gravel, dark brown and gray black, some light brown, moist, brick and concrete pieces throughout					0.96		
						0.60		
						1.02		
4						1.86		
						1.52		
						1.97		
6						0.79		
	CL-CLAY, trace silt, trace gravel, very stiff, low plasticity, slow dilatancy, medium toughness, fine and coarse gravel, dark brown, some brown black, moist	602.61		1			013	6.5 - 8'
8	ML-CLAYEY SILT, dense, low plasticity, slow dilatancy, trace coarse gravel, light brown, some gray, moist	601.61				43.89		
		600.61		2		17.91	014	8 - 10'
10	SM-SILTY SAND, compact, fine sand, trace medium sand, poorly graded, slow dilatancy, light brown, moist to wet	599.41				4.56		
		598.11		3		1.33	015	10 - 11'
12	ML-SILT, trace sand, trace clay, compact, some low plasticity, slow dilatancy, fine sand, brown to light brown, tan brown, moist to wet - Refusal, WG-016 at 11.0ft BGS END OF BOREHOLE @ 11.0ft BGS							
14								
16								
18								
20								
22								
24								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 9, 2020

CHEMICAL ANALYSIS

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STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

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PROJECT NAME: Genesis Development
PROJECT NUMBER: 11219347
CLIENT: Genesis Development, LLC
LOCATION: 1130 Niagara Street, Buffalo, NY

HOLE DESIGNATION: GP-64
DATE COMPLETED: 24 November 2020
DRILLING METHOD: HSA Split Spoon
FIELD PERSONNEL: Doug Oscar

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	GAS PROBE	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1062041.63 EASTING: 1063322.03	GROUND SURFACE 610.70						
2	FILL, some silt, gravel, sand, rock fragments, dark brown - silt, some sand, gravel, dark brown to black at 0.8ft BGS	608.70				7.54		
						2.59		
	FILL, medium to coarse sand, fine to medium gravel, little silt, dark brown to gray	606.70				2.01		
4						2.35		
	FILL, medium to coarse gravel, little medium to coarse sand and silt, gray	606.70				4.32		
6						2.84		
						0.23		
8						0.98		
	CLAY, some silt, little fine to medium sand, fine to medium gravel, brown	602.70				30.93		
	SILT, little clay, trace fine sand, brown	601.90		1		4.86	198	8' - 10'
10						0.58		
				2		3.47	199	10' - 11.8'
12	SILT, some clay, some fine sand, trace fine gravel, red-brown - WG-213 at 11.8ft BGS	599.10 598.90						
	END OF BOREHOLE @ 11.8ft BGS							
14								
16								
18								
20								
22								
24								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 25, 2020

CHEMICAL ANALYSIS ○

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STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: Genesis Development
PROJECT NUMBER: 11219347
CLIENT: Genesis Development, LLC
LOCATION: 1130 Niagara Street, Buffalo, NY

HOLE DESIGNATION: GP-67
DATE COMPLETED: 17 November 2020
DRILLING METHOD: HSA Split Spoon
FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	GAS PROBE	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1062061 EASTING: 1063226	GROUND SURFACE 603.53						
	SAND (FILL), with silt, trace gravel, fine sand, some medium sand, fine gravel, brown, moist CONCRETE	603.13						
2								
	CL-CLAY, trace silt, trace sand, stiff, medium plasticity, slow dilatancy, medium toughness, fine sand, black, some green, light brown, moist	601.33		1		0.69	169	2 - 4'
4						1.13		
	- with sand, brown, some dark brown, orange-red at 4.3ft BGS			2		0.30	170/171	4 - 5.4'
6						1.46		
	- Refusal at 5.4ft BGS	598.13						
	END OF BOREHOLE @ 5.4ft BGS							
8								
10								
12								
14								
16								
18								
20								
22								
24								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



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STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: Genesis Development
PROJECT NUMBER: 11219347
CLIENT: Genesis Development, LLC
LOCATION: 1130 Niagara Street, Buffalo, NY

HOLE DESIGNATION: GP-68
DATE COMPLETED: 17 November 2020
DRILLING METHOD: HSA Split Spoon
FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	GAS PROBE	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1062058 EASTING: 1063256 GROUND SURFACE	605.74						
	SAND (FILL), with silt, trace gravel, fine sand, trace medium and coarse sand, fine gravel, brown, moist	604.84				0.18		
	CONCRETE, brick	604.44				0.37		
2	SAND (FILL), gravel, cobbles, fine to coarse sand, fine and coarse gravel, brown, moist, brick and concrete pieces	603.74		1		0.85	172	2 - 4'
	CL-CLAY, with sand, soft, low plasticity, slow dilatancy, fine sand, grading to brown-black	602.74 602.44				2.31		
4	SP-SAND, loose, coarse and medium sand, poorly graded, rapid dilatancy, brown-black, wet			2		1.26	173	4 - 6'
	CL-CLAY, trace silt, trace sand, stiff, low plasticity, slow dilatancy, fine sand, orange-brown and brown-black, moist					4.27		
6	- no sand, no orange-black at 4.0ft BGS	599.54		3		7.09	174	6 - 7.4'
	ML-SANDY SILT, compact, non-plastic, slow dilatancy, fine sand, light brown, moist							
8	- Refusal, WG-177 at 7.4ft BGS END OF BOREHOLE @ 7.4ft BGS	598.34						
10								
12								
14								
16								
18								
20								
22								
24								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 17, 2020

CHEMICAL ANALYSIS ○

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STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: Genesis Development
PROJECT NUMBER: 11219347
CLIENT: Genesis Development, LLC
LOCATION: 1130 Niagara Street, Buffalo, NY

HOLE DESIGNATION: GP-69
DATE COMPLETED: 17 November 2020
DRILLING METHOD: HSA Split Spoon
FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	GAS PROBE	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1062058 EASTING: 1063287	GROUND SURFACE 608.08						
2	SAND (FILL), gravel, fine to medium sand, fine and coarse gravel, loose, brown, moist, brick pieces					1.74		
						1.25		
						4.24		
4	- with clay, compact at 3.5ft BGS					2.52		
	SAND (FILL), gravel, coarse sand, with medium sand, coarse and fine gravel, brown, moist, brick	604.08				3.46		
6	- gray-black, moderate odor, wet, concrete at 5.0ft BGS					3.49		
						3.56		
8	CL-SANDY CLAY, stiff, low plasticity, slow dilatancy, fine sand, orange-light brown, moist	601.28				4.39		
						2.29		
10	SM-SILTY SAND, dense, fine sand, slow dilatancy, some low plasticity, light brown, moist	599.38		1		2.37	179	8 - 9.8'
	- with clay banding at 9.4ft BGS	598.28						
	- Refusal, WG-180 at 9.8ft BGS							
	END OF BOREHOLE @ 9.8ft BGS							
12								
14								
16								
18								
20								
22								
24								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 18, 2020

CHEMICAL ANALYSIS

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STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

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PROJECT NAME: Genesis Development
PROJECT NUMBER: 11219347
CLIENT: Genesis Development, LLC
LOCATION: 1130 Niagara Street, Buffalo, NY

HOLE DESIGNATION: MW-106
DATE COMPLETED: 20 November 2020
DRILLING METHOD: HSA/HQ Core
FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	MONITOR INSTALLATION	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1061979 EASTING: 1063314	GROUND SURFACE 615.08 TOP OF CASING 615.02 TOP OF RISER 614.60						
	CONCRETE	614.58						
2	SAND (FILL), fine grained, loose, light brown, moist			1		0.81	189	0.5 - 2'
						0.90		
4	- grading to dark brown and brown at 3.0ft BGS - concrete piece at 3.2ft BGS - trace coarse gravel at 3.8ft BGS	611.08		2		0.05	190	2 - 4'
						0.25		
6	SILT (FILL), with clay, dense, low plasticity, slow dilatancy, trace fine sand, dark brown, moist	610.08		3		0.22	191	4 - 6'
						0.36		
8	CLAY (FILL), very stiff, low plasticity, slow dilatancy, medium toughness, red-brown, moist			4		0.27	192	6 - 8'
	- trace native silt at 6.7ft BGS					0.44		
	- with silt, some gray banding at 7.6ft BGS					0.70		
10	- trace silt, trace fine gravel at 9.3ft BGS			5		0.64	193/194	8 - 10'
						1.68		
12				6		1.56	195	10 - 12'
						0.46		
14	ML-SANDY SILT, dense, non-plastic, fine grained sand, light brown, moist	601.78		7		0.57	196	12 - 14'
						0.36		
16	- spoon refusal, limited weathering from 16.2 to 16.3ft BGS - open horizontal fracture at 16.5ft BGS END OF OVERBURDEN HOLE @ 16.3ft BGS			8		0.53	197	14 - 16'
18								
20								
22								
24								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ December 4, 2020

CHEMICAL ANALYSIS ○

File: C:\USERS\CACHILDS\DESKTOP\11219347-ML.GPJ Library File: 11219347.GLB Report: OVERBURDEN LOG Date: 10/3/21

PROJECT NAME: Jenesis Development

PROJECT NUMBER: 11219347

CLIENT: Jenesis Development, LLC

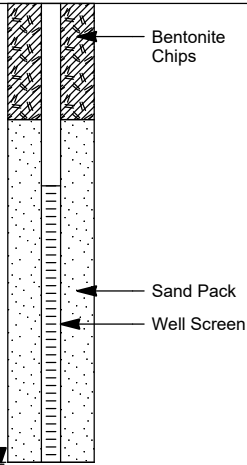
LOCATION: 1130 Niagara Street, Buffalo, NY

HOLE DESIGNATION: MW-106

DATE COMPLETED: 20 November 2020

DRILLING METHOD: HSA/HQ Core

FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	MONITOR INSTALLATION	RUN NUMBER	CORE RECOVERY %	RQD %
16	- spoon refusal, limited weathering from 16.2 to 16.3ft BGS - open horizontal fracture at 16.5ft BGS	598.78		1	100	58
18	LIMESTONE BEDROCK (Onondaga), gray to dark gray, thin laminations, microcrystalline, some interbedded fine grains, dense, some slightly porous, smooth, chert nodules throughout - closed near vertical fracture at 16.8ft BGS - open horizontal fracture at 17.3ft BGS - open horizontal fracture at 17.4ft BGS - open horizontal fracture at 17.6ft BGS - open horizontal fracture at 17.9ft BGS - open horizontal fracture at 18.2ft BGS - open horizontal fracture at 18.6ft BGS - closed horizontal fracture at 18.8ft BGS - open horizontal fracture at 19.1ft BGS - closed horizontal fracture at 19.5ft BGS - closed horizontal fracture at 20.7ft BGS - open horizontal fracture at 21.0ft BGS - open horizontal fracture at 21.3ft BGS - WG-237 at 22.3ft BGS	592.78	<u>WELL DETAILS</u> Screened interval: 597.78 to 592.78BGS 17.30 to 22.30ft BGS Length: 5ft Diameter: 2in Slot Size: 0.010 Material: SS Sand Pack: 598.98 to 592.78BGS 16.10 to 22.30ft BGS Material: #00N Sand	2	98	64
20						
22						
24						
26	END OF BOREHOLE @ 22.3ft BGS					
28						
30						
32						
34						
36						
38						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL  December 4, 2020

CHEMICAL ANALYSIS



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 2

PROJECT NAME: Genesis Development

HOLE DESIGNATION: MW-107

PROJECT NUMBER: 11219347

DATE COMPLETED: 1 December 2020

CLIENT: Genesis Development, LLC

DRILLING METHOD: HSA/HQ Core

LOCATION: 1130 Niagara Street, Buffalo, NY

FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	MONITOR INSTALLATION	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1061962 EASTING: 1063230	TOP OF CASING 615.42 GROUND SURFACE 615.31 TOP OF RISER 615.09						
	CONCRETE	614.81				4.29		
2	SILT (FILL), clay, sand, dense, low plasticity, slow dilatancy, red-brown, moist, brick and concrete pieces	613.31		1		4.74	218	0.5 - 2'
	CLAY (FILL), very stiff, medium plasticity, slow dilatancy, medium toughness, light brown, moist	612.31		2		4.09	219	2 - 4'
4	SAND (FILL), loose, fine grained, tan-brown, moist	611.81				4.07		
	FILL, brick	611.11				3.42		
6	SAND (FILL), with gravel, trace silt, compact, fine and medium sand, fine and coarse angular gravel, light brown and gray, moist	610.11		3		2.77	220	4 - 6'
	CL-CLAY, very stiff, medium plasticity, slow dilatancy, light orange-red-brown, moist			4		3.56	221	6 - 8'
8	SM-SAND, trace clay, trace gravel, compact, fine sand, with medium sand, coarse gravel, poorly graded, light brown, moist	607.71				3.47		
	CL-CLAY, very stiff, low plasticity, slow dilatancy, trace fine angular gravel, light brown, trace orange-brown, moist	607.01		5		10.4	222	8 - 10'
10	- trace silt at 10.5ft BGS					10.60		
				6		18.97	223	10 - 12'
12						9.31		
				7		4.42	224	12 - 14'
14						5.15		
	- coarse angular gravel, trace fine sand from 14.7 to 15.2ft BGS			8		42.58	225	14 - 16.2'
16	SM-SILTY SAND, trace clay, trace gravel, dense, fine sand, fine gravel, poorly graded, non-plastic, some low plasticity, light brown, moist	600.11				1847.00		
18	- spoon refusal, limited weathering from 16.2 to 16.4ft BGS							
	- closed horizontal fracturing at 16.6ft BGS							
	END OF OVERBURDEN HOLE @ 16.4ft BGS							
20								
22								
24								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ December 4, 2020

CHEMICAL ANALYSIS



File: C:\USERS\CACHILDS\DESKTOP\11219347-MI.GPJ Library File: 11219347.GLB Report: OVERBURDEN LOG Date: 10/3/21



STRATIGRAPHIC AND INSTRUMENTATION LOG (BEDROCK)

Page 2 of 2

PROJECT NAME: Genesis Development

HOLE DESIGNATION: MW-107

PROJECT NUMBER: 11219347

DATE COMPLETED: 1 December 2020

CLIENT: Genesis Development, LLC

DRILLING METHOD: HSA/HQ Core

LOCATION: 1130 Niagara Street, Buffalo, NY

FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	MONITOR INSTALLATION	RUN NUMBER	CORE RECOVERY %	RQD %
16	- coarse angular gravel, trace fine sand from 14.7 to 15.2ft BGS SM-SILTY SAND, trace clay, trace gravel, dense, fine sand, fine gravel, poorly graded, non-plastic, some low plasticity, light brown, moist - spoon refusal, limited weathering from 16.2 to 16.4ft BGS - closed horizontal fracturing at 16.6ft BGS	600.11 598.91	Bentonite Chips	1	92	64
18	LIMESTONE BEDROCK (Onondaga), gray-brown, some dark gray, microcrystalline, interbedded fine grains, smooth, thin laminations, some massive, calcite cement, some chert, some slightly porous - open horizontal fracturing at 16.9ft BGS - closed horizontal fracturing at 18.0ft BGS - open horizontal fracturing at 19.3ft BGS - open horizontal fracturing at 20.4ft BGS - open horizontal fracturing at 21.7ft BGS - WG-238 at 22.2ft BGS	593.11	Sand Pack Well Screen	2	100	86
22	END OF BOREHOLE @ 22.2ft BGS					
24						
26						
28						
30						
32						
34						
36						
38						

WELL DETAILS

Screened interval:

598.11 to 593.11BGS

17.20 to 22.20ft BGS

Length: 5ft

Diameter: 2in

Slot Size: 0.010

Material: SS

Sand Pack:

599.11 to 593.11BGS

16.20 to 22.20ft BGS

Material: #00N Sand

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ December 4, 2020

CHEMICAL ANALYSIS ○



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 2

PROJECT NAME: Genesis Development
PROJECT NUMBER: 11219347
CLIENT: Genesis Development, LLC
LOCATION: 1130 Niagara Street, Buffalo, NY

HOLE DESIGNATION: MW-108
DATE COMPLETED: 2 December 2020
DRILLING METHOD: HSA/HQ Core
FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	MONITOR INSTALLATION	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1061960 EASTING: 1063174	TOP OF CASING 615.29 GROUND SURFACE 615.29 TOP OF RISER 614.98						
	CONCRETE	614.79						
2	CLAY (FILL), very stiff, low plasticity, slow dilatancy, medium toughness, brown, moist, brick pieces	613.69		1		3.23	226	0.5 - 2'
	SAND (FILL), loose, fine grained, tan, moist, ash pieces					2.79		
4				2		2.43	227	2 - 4'
						2.96		
	FILL, brick	610.79		3		3.09	228	4 - 6'
6	SAND (FILL), loose, medium grained, some coarse sand, brown, moist, brick pieces	609.79				3.28		
	- trace coarse gravel at 7.0ft BGS - trace fine sand at 7.5ft BGS			4		3.82	229	6 - 8'
8						4.36		
	CL-CLAY, very stiff, low plasticity, slow dilatancy, medium toughness, red-brown, moist	607.09		5		3.75	230	8 - 10'
10	ML-SILT, trace clay, compact, non-plastic, slow dilatancy, dark brown, moist	606.59				3.37		
	SM-SILTY SAND, compact, fine sand, non-plastic, slow dilatancy, light brown, moist	606.09		6		3.67	231	10 - 12'
12	CL-CLAY, trace gravel, very stiff, low plasticity, slow dilatancy, fine gravel, red-brown, moist	605.49				3.44		
	- trace silt, trace green clay at 12.0ft BGS			7		3.45	232	12 - 14'
14						3.34		
	SM-SAND, with silt, trace gravel, loose, to compact, fine sand, trace medium sand, fine gravel, light brown, moist	600.39		8		3.86	233	14 - 15.9'
16	- silty sand at 15.7ft BGS - spoon refusal, limited weathering from 15.9 to 16.3ft BGS					4.01		
18	END OF OVERBURDEN HOLE @ 16.3ft BGS							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ December 4, 2020

CHEMICAL ANALYSIS

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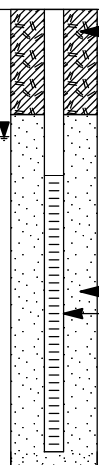


STRATIGRAPHIC AND INSTRUMENTATION LOG (BEDROCK)

Page 2 of 2

PROJECT NAME: Genesis Development
PROJECT NUMBER: 11219347
CLIENT: Genesis Development, LLC
LOCATION: 1130 Niagara Street, Buffalo, NY

HOLE DESIGNATION: MW-108
DATE COMPLETED: 2 December 2020
DRILLING METHOD: HSA/HQ Core
FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	MONITOR INSTALLATION	RUN NUMBER	CORE RECOVERY %	RQD %
16	SM-SAND, with silt, trace gravel, loose, to compact, fine sand, trace medium sand, fine gravel, light brown, moist - silty sand at 15.7ft BGS - spoon refusal, limited weathering from 15.9 to 16.3ft BGS	600.39 598.99		1	100	100
18	LIMESTONE BEDROCK (Onondaga), dark gray to gray, some light brown, thin laminations, microcrystalline, some fine grains, smooth, laminated, calcite cement, limited porosity, chert nodules throughout			2	98	
20	END OF BOREHOLE @ 16.3ft BGS - open horizontal fracture at 18.0ft BGS - open horizontal fracture at 18.4ft BGS - open horizontal fracture at 19.3ft BGS - open horizontal fracture at 19.4ft BGS - open horizontal fracture at 20.0ft BGS - open horizontal fracture at 20.8ft BGS - open horizontal fracture at 21.7ft BGS - WG-239 at 22.3ft BGS	592.99				88
22						
24						
26						
28						
30						
32						
34						
36						
38						

WELL DETAILS

Screened interval:

598.29 to 593.29BGS

17.00 to 22.00ft BGS

Length: 5ft

Diameter: 2in

Slot Size: 0.010

Material: SS

Sand Pack:

599.39 to 592.99BGS

15.90 to 22.30ft BGS

Material: #00N Sand

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ December 4, 2020

CHEMICAL ANALYSIS ○

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STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 2

PROJECT NAME: Genesis Development
PROJECT NUMBER: 11219347
CLIENT: Genesis Development, LLC
LOCATION: 1130 Niagara Street, Buffalo, NY

HOLE DESIGNATION: MW-109
DATE COMPLETED: 23 November 2020
DRILLING METHOD: HSA/HQ Core
FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	MONITOR INSTALLATION	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1062004 EASTING: 1063269	TOP OF CASING TOP OF RISER GROUND SURFACE 612.75 612.56 609.80						
2	SAND (FILL), fine to medium grained, little silt, gravel, trace clay, dark brown, brick		Cement	1		2.09	208	0 - 2'
						2.16		
4	CONCRETE	605.80	Cement/ Bentonite Grout	2		2.44	209	2 - 4'
						4.62		
6	SILTY CLAY (FILL), gravel, wood, concrete chunks, wet	603.80						
		602.90		3		10.21	210	6 - 8'
8	SILT, some clay, little fine to medium gravel, trace fine to medium sand, brown					22.32		
				4		41.32	211	8 - 10'
10	SILT, some fine to medium sand, little clay, fine to medium gravel, brown	599.80	Bentonite Chips	5		246	212	10 - 10.7'
	- spoon refusal at 10.7ft BGS					53.72		
12	- limited weathering from 10.6 to 10.7ft BGS END OF OVERBURDEN HOLE @ 10.7ft BGS							
14								
16								
18								
20								
22								
24								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ December 4, 2020

CHEMICAL ANALYSIS ○

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STRATIGRAPHIC AND INSTRUMENTATION LOG (BEDROCK)

Page 2 of 2

PROJECT NAME: Genesis Development
PROJECT NUMBER: 11219347
CLIENT: Genesis Development, LLC
LOCATION: 1130 Niagara Street, Buffalo, NY

HOLE DESIGNATION: MW-109
DATE COMPLETED: 23 November 2020
DRILLING METHOD: HSA/HQ Core
FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	MONITOR INSTALLATION	RUN NUMBER	CORE RECOVERY %	RQD %
10	SILT, some fine to medium sand, little clay, fine to medium gravel, brown - spoon refusal at 10.7ft BGS - limited weathering from 10.6 to 10.7ft BGS	599.80 599.10	Bentonite Chips	1	100	54
12	LIMESTONE BEDROCK (Onondaga), dark gray and gray, thin laminations, microcrystalline, some fine grained throughout, calcite cementation, chert nodules, limited porosity, horizontal to near horizontal fracturing, smooth - fracture at 11.0ft BGS - fracture at 11.2ft BGS - fracture at 11.4ft BGS - fracture at 11.5ft BGS - fracture at 11.8ft BGS - fracture at 12.2ft BGS - fracture at 13.6ft BGS - fracture at 13.8ft BGS - fracture at 14.5ft BGS - fracture at 15.0ft BGS - fracture at 15.4ft BGS - fracture at 15.7ft BGS - fracture at 16.4ft BGS - WG-234 at 16.7ft BGS	593.10	Sand Pack Well Screen	2	100	81
14						
16						
18						
20						
22						
24						
26						
28						
30						
32						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ December 4, 2020

CHEMICAL ANALYSIS



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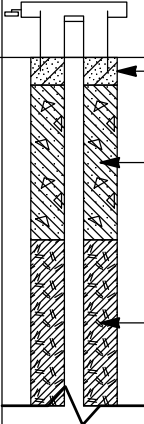


STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 2

PROJECT NAME: Genesis Development
PROJECT NUMBER: 11219347
CLIENT: Genesis Development, LLC
LOCATION: 1130 Niagara Street, Buffalo, NY

HOLE DESIGNATION: MW-110
DATE COMPLETED: 30 November 2020
DRILLING METHOD: HSA/HQ Core
FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	MONITOR INSTALLATION	SAMPLE				
				NUMBER	INTERVAL	FID (ppm)	Soil Sample No.	Soil Sample Interval
	NORTHING: 1062014 EASTING: 1063212 TOP OF CASING TOP OF RISER GROUND SURFACE	608.47 608.28 605.50						
2	SAND (FILL), gravel, trace clay, fine to medium sand, fine and coarse gravel, light brown and gray, moist, brick and concrete pieces - rock fragments at 3.0ft BGS		Cement Cement/ Bentonite Grout	1		3.24 3.96	215	0 - 2'
4	CL-CLAY, stiff to soft, medium plasticity, slow dilatancy, medium toughness, light tan-brown, moist ROCK fragments	602.00 601.00 600.75	Bentonite Chips	2		5.07 4.38	216	2 - 4'
6	SM-SILTY SAND, trace clay, trace gravel, fine sand, trace medium sand, fine and coarse gravel, compact, low plasticity, gray-brown, moist - spoon refusal at 6.3ft BGS - limited weathering from 6.2 to 6.3ft BGS END OF OVERBURDEN HOLE @ 6.3ft BGS			3		4.41 10.99 11.46	217	4 - 6'
8								
10								
12								
14								
16								
18								
20								
22								
24								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ December 4, 2020

CHEMICAL ANALYSIS ○

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STRATIGRAPHIC AND INSTRUMENTATION LOG (BEDROCK)

Page 2 of 2

PROJECT NAME: Genesis Development
PROJECT NUMBER: 11219347
CLIENT: Genesis Development, LLC
LOCATION: 1130 Niagara Street, Buffalo, NY

HOLE DESIGNATION: MW-110
DATE COMPLETED: 30 November 2020
DRILLING METHOD: HSA/HQ Core
FIELD PERSONNEL: Alissa Cannon

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	MONITOR INSTALLATION	RUN NUMBER	CORE RECOVERY %	RQD %
6	ROCK fragments SM-SILTY SAND, trace clay, trace gravel, fine sand, trace medium sand, fine and coarse gravel, compact, low plasticity, gray-brown, moist - spoon refusal at 6.3ft BGS - limited weathering from 6.2 to 6.3ft BGS	601.00 600.75 599.20	Bentonite Chips Sand Pack	1	88	61
8	LIMESTONE BEDROCK (Onondaga), dolomite, dark gray to gray, some bluish gray, thin laminations, some gray-black thin laminations, microcrystalline, some interbedded fine grains throughout, calcite cementation, some chert, dense, some slightly porous, smooth - near open horizontal fracture at 6.8ft BGS - closed horizontal fracture at 7.0ft BGS - closed horizontal fracture at 7.2ft BGS - closed horizontal fracture at 7.4ft BGS - closed horizontal fracture at 8.8ft BGS - closed horizontal fracture at 9.3ft BGS - closed horizontal fracture at 10.4ft BGS - closed horizontal fracture at 10.9ft BGS - closed horizontal fracture at 11.2ft BGS - closed horizontal fracture at 11.4ft BGS - closed horizontal fracture at 11.6ft BGS - WG-235/236 at 12.3ft BGS	593.20	Well Screen	2	100	83
10	END OF BOREHOLE @ 12.3ft BGS					
12						
14						
16						
18						
20						
22						
24						
26						
28						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ December 4, 2020

CHEMICAL ANALYSIS ○

File: C:\USERS\CACHILDS\DESKTOP\11219347-MI.GPJ Library File: 11219347.GLB Report: BEDROCK LOG Date: 10/3/21

Appendix B

PDI Data Validation Report



Memorandum

January 26, 2021

To: Kathy Galanti

Ref. No.: 11219347

From: Kathy Willy/adh/1

Tel: 716-205-1942

CC: Chris Barton

**Subject: Analytical Results and Reduced Validation
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020**

1. Introduction

This document details a reduced validation of analytical results for groundwater, soil, and non-aqueous phase liquid (NAPL) samples collected in support of the Pre-Design Investigation sampling at the Jenesis Leisure Living Site during November and December 2020. Samples were submitted to Eurofins TestAmerica Laboratory located in Amherst, New York. A sample collection and analysis summary is presented in Table 1. The validated analytical results are summarized in Tables 2A, 2B, and 2C. A summary of the analytical methodology is presented in Table 3.

Standard Level 2 report deliverables were submitted by the laboratory. The final results and supporting quality assurance/quality control (QA/QC) data were assessed. Evaluation of the data was based on information obtained from the chain of custody forms, finished report forms, method blank data, recovery data from surrogate spikes/laboratory control samples (LCS)/matrix spikes (MS), and field QA/QC samples.

The QA/QC criteria by which these data have been assessed are outlined in the analytical methods referenced in Table 3 and applicable guidance from the documents entitled:

- i) "USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review," United States Environmental Protection Agency (USEPA) 540-R-2016-002, September 2016
- ii) "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review", USEPA 540-R-2016-001, September 2016

These items will subsequently be referred to as the "Guidelines" in this Memorandum.



2. Sample Holding Time and Preservation

The sample holding time criteria for the analyses are summarized in Table 3. Sample chain of custody documents and analytical reports were used to determine sample holding times. All samples were prepared and analyzed within the required holding times.

All samples were properly preserved, delivered on ice, and stored by the laboratory at the required temperature (0-6°C).

3. Laboratory Method Blank Analyses

Method blanks are prepared from a purified matrix and analyzed with investigative samples to determine the existence and magnitude of sample contamination introduced during the analytical procedures.

For this study, laboratory method blanks were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

All method blank results were non-detect, indicating that laboratory contamination was not a factor for this investigation.

4. Surrogate Spike Recoveries - Organic Analyses

In accordance with the methods employed, all samples, blanks, and QC samples analyzed for organics are spiked with surrogate compounds prior to sample extraction and/or analysis. Surrogate recoveries provide a means to evaluate the effects of laboratory performance on individual sample matrices.

All samples submitted for volatile (VOC) determinations were spiked with the appropriate number of surrogate compounds prior to sample analysis.

Surrogate recoveries were assessed against laboratory control limits. All surrogate recoveries met the laboratory criteria.

5. Laboratory Control Sample Analyses

LCS/laboratory control sample duplicate (LCSD) are prepared and analyzed as samples to assess the analytical efficiencies of the methods employed, independent of sample matrix effects. The relative percent difference (RPD) of the LCS/LCSD recoveries is used to evaluate analytical precision.

For this study, LCS were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

The LCS or LCS/LCSD contained all compounds of interest. Most LCS recoveries and RPDs (where applicable) were within the laboratory control limits, demonstrating acceptable analytical accuracy and precision. All sample results associated with high recoveries were non-detect and would not have been



impacted by the implied high bias. Sample results associated with low recoveries were qualified as estimated to reflect the implied low bias. A summary of qualified results is presented in Table 4.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analyses

To evaluate the effects of sample matrices on the extraction process, measurement procedures, and accuracy of a particular analysis, samples are spiked with a known concentration of the analyte of concern and analyzed as MS/MSD samples. The RPD between the MS and MSD is used to assess analytical precision. If the original sample concentration is significantly greater than the spike concentration, the recovery is not assessed. If only the MS or MSD recovery was outside of control limits, no qualification of the data was performed based on the acceptable recovery of the companion spike and the acceptable RPD.

MS/MSD analyses were performed at the proper frequency by the laboratory.

Organic Analyses

The MS/MSD samples were spiked with all compounds of interest. Most percent recoveries and RPD values were within the laboratory control limits, demonstrating acceptable analytical accuracy and precision. Sample results associated with outlying recoveries were qualified as follows:

- i) Positive sample results associated with high recoveries were qualified as estimated to reflect the implied high bias. Non-detect sample results would not have been impacted, and no qualification of the data was required.
- ii) Sample results associated with low recoveries greater than 10 percent were qualified as estimated to reflect the implied low bias.
- iii) Sample results associated with low recoveries less than 10 percent were rejected due to the demonstrated poor analytical efficiency.

A summary of qualified results are presented in Table 5.

7. Field QA/QC Samples

The field QA/QC consisted of 14 trip blank samples, 8 rinse blank samples, and 14 field duplicate sample sets.

7.1 Trip Blank Sample Analysis

To evaluate contamination from sample collection, transportation, storage, and analytical activities, 14 trip blanks were submitted to the laboratory for VOC analyses. All results were non-detect for the compounds of interest.



7.2 Rinse Blank Sample Analysis

To assess field decontamination procedures, ambient conditions at the site, and cleanliness of sample containers, eight rinse blanks were submitted for analysis, as identified in Table 1. All results were non-detect for the analytes of interest with the exception of a low concentration of chloroform in all the rinse blanks. All associated sample results were non-detect, and no qualification of the data was required.

7.3 Field Duplicate Sample Analysis

To assess the analytical and sampling protocol precision, 14 field duplicate samples were collected and submitted "blind" to the laboratory, as specified in Table 1. The RPDs associated with these duplicate samples must be less than 50 and 100 percent for water and soil samples, respectively. If the reported concentration in either the investigative sample or its duplicate is less than five times the reporting limit (RL), the evaluation criteria is one or two times the RL value for water and soil samples, respectively.

Most field duplicate results were within agreement, demonstrating acceptable sampling and analytical precision. The results between sample S-11219347-111620-AMC-133 and its duplicate did show some variability. A summary of qualified results is presented in Table 6.

8. Analyte Reporting

The laboratory reported detected results down to the laboratory's method detection limit (MDL) for each analyte. Positive analyte detections less than the RL but greater than the MDL were qualified as estimated (J) in Tables 2A-2C, unless qualified otherwise in this memorandum. Non-detect results were presented as non-detect at the RL in Tables 2A-2C.

The trichloroethene result for sample S-11219347-112020-AMC-197 exceeded the instruments calibrated range. The sample results have been qualified as estimated to reflect the calibration exceedance.

9. Conclusion

Based on the assessment detailed in the foregoing, the data summarized in Tables 2A-2C are acceptable with the specific qualifications and exceptions noted herein.

Table 1												
Sample Collection and Analysis Summary												
Pre-Design Investigation												
Jenesis Leisure Living Site												
Buffalo, New York												
November-December 2020												
Sample Delivery Group	Sample Identification	Location	Matrix	Initial Sample Depth (ft. bgs)	Final Sample Depth (ft. bgs)	Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	Analysis/Parameters				Comments
								VOCs	TPH DRO/ORO	Specific Gravity	FOC	
4801778741	S-11219347-110920-AMC-002	GP-59	Soil	4	4.9	11/09/2020	09:30	X				
4801778741	S-11219347-110920-AMC-004	GP-60	Soil	2	4	11/09/2020	10:10	X				
4801778741	S-11219347-110920-AMC-007	GP-61	Soil	4	6	11/09/2020	11:00	X				
4801778741	S-11219347-110920-AMC-011	GP-62	Soil	6	8	11/09/2020	12:00	X				
4801778741	S-11219347-110920-AMC-013	GP-63	Soil	6.5	8	11/09/2020	14:40	X				
4801778741	S-11219347-110920-AMC-020	GP-57	Soil	8	10	11/09/2020	16:00	X				
4801779691	S-11219347-110920-AMC-001	GP-59	Soil	3	4	11/09/2020	09:30	X				
4801779691	S-11219347-110920-AMC-003	GP-59	Soil	0	2	11/09/2020	09:30				X	
4801779691	S-11219347-110920-AMC-005	GP-60	Soil	4	4.9	11/09/2020	10:10	X				
4801779691	S-11219347-110920-AMC-006	GP-61	Soil	2	4	11/09/2020	11:00	X				
4801779691	S-11219347-110920-AMC-008	GP-61	Soil	6	6.5	11/09/2020	11:00	X				
4801779691	S-11219347-110920-AMC-010	GP-62	Soil	4	6	11/09/2020	12:00	X				
4801779691	S-11219347-110920-AMC-012	GP-62	Soil	8	9.7	11/09/2020	12:00	X				
4801779691	S-11219347-110920-AMC-014	GP-63	Soil	8	10	11/09/2020	14:40	X				
4801779691	S-11219347-110920-AMC-015	GP-63	Soil	10	11	11/09/2020	14:40	X				
4801779691	S-11219347-110920-AMC-017	GP-57	Soil	2	4	11/09/2020	15:40	X				
4801779691	S-11219347-110920-AMC-018	GP-57	Soil	4	6	11/09/2020	15:40	X				
4801779691	S-11219347-110920-AMC-019	GP-57	Soil	6	8	11/09/2020	15:40	X				
4801779691	S-11219347-110920-AMC-021	GP-57	Soil	10	11.5	11/09/2020	15:40	X				
4801779691	S-11219347-111020-AMC-022	GP-51	Soil	2	4	11/10/2020	08:00	X				
4801779691	S-11219347-111020-AMC-023	GP-51	Soil	4	6	11/10/2020	08:00	X				
4801779691	S-11219347-111020-AMC-024	GP-51	Soil	6	8	11/10/2020	08:00	X				
4801779691	S-11219347-111020-AMC-025	GP-51	Soil	8	10	11/10/2020	08:00	X				
4801779691	S-11219347-111020-AMC-026	GP-51	Soil	8	10	11/10/2020	08:00	X				Field duplicate of sample S-11219347-111020-AMC-025
4801779691	S-11219347-111020-AMC-027	GP-51	Soil	10	12.3	11/10/2020	08:00	X				
4801779691	S-11219347-111020-AMC-028	GP-51	Soil	10	11.5	11/10/2020	08:00				X	
4801779691	S-11219347-111020-AMC-029	GP-45	Soil	6	8	11/10/2020	09:30	X				
4801779691	S-11219347-111020-AMC-030	GP-45	Soil	9	11	11/10/2020	09:30	X				
4801779691	S-11219347-111020-AMC-031	GP-45	Soil	11	13	11/10/2020	09:30	X				
4801779691	S-11219347-111020-AMC-032	GP-45	Soil	13	15.3	11/10/2020	09:30	X				
4801779691	S-11219347-111020-AMC-033	GP-45	Soil	11	13	11/10/2020	09:30				X	
4801779691	S-11219347-111020-AMC-034	GP-40	Soil	5	7	11/10/2020	11:40	X				
4801779691	S-11219347-111020-AMC-035	GP-40	Soil	7	9	11/10/2020	11:40	X				
4801779691	S-11219347-111020-AMC-036	GP-40	Soil	9	11	11/10/2020	11:40	X				
4801779691	S-11219347-111020-AMC-038	GP-40	Soil	11	13	11/10/2020	11:40	X				
4801779691	S-11219347-111020-AMC-042	GP-40	Soil	13	15.5	11/10/2020	11:40	X				
4801779691	S-11219347-111020-AMC-043	GP-31-1	Soil	6	8	11/10/2020	15:30	X				
4801779691	S-11219347-111020-AMC-044	GP-31-1	Soil	6	8	11/10/2020	15:30	X				Field duplicate of sample S-11219347-111020-AMC-043
4801779691	S-11219347-111020-AMC-045	GP-31-1	Soil	8	10	11/10/2020	15:30	X				
4801779691	S-11219347-111020-AMC-046	GP-31-1	Soil	10	12	11/10/2020	15:30	X				
4801779691	S-11219347-111020-AMC-047	GP-31-1	Soil	12	14	11/10/2020	15:30	X				
4801779691	S-11219347-111020-AMC-048	GP-31-1	Soil	14	16.3	11/10/2020	15:30	X				
4801780511	S-11219347-111120-AMC-051	GP-33-1	Soil	3	5	11/11/2020	09:15				X	
4801780511	S-11219347-111120-AMC-053	GP-33-1	Soil	7	9	11/11/2020	09:15	X				
4801780511	S-11219347-111120-AMC-054	GP-33-1	Soil	9	11	11/11/2020	09:15	X				
4801780511	S-11219347-111120-AMC-055	GP-33-1	Soil	11	13	11/11/2020	09:15	X				
4801780511	S-11219347-111120-AMC-056	GP-33-1	Soil	13	15	11/11/2020	09:15	X				

Table 1												
Sample Collection and Analysis Summary												
Pre-Design Investigation												
Jenesis Leisure Living Site												
Buffalo, New York												
November-December 2020												
Sample Delivery Group	Sample Identification	Location	Matrix	Initial Sample Depth (ft. bgs)	Final Sample Depth (ft. bgs)	Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	Analysis/Parameters				Comments
								VOCs	TPH DRO/ORO	Specific Gravity	FOC	
4801780511	S-11219347-111120-AMC-057	GP-33-1	Soil	15	16.3	11/11/2020	09:15	X				
4801780511	S-11219347-111120-AMC-058	GP-35-1	Soil	4.5	6	11/11/2020	11:00	X				
4801780511	S-11219347-111120-AMC-059	GP-35-1	Soil	6	8	11/11/2020	11:00	X				
4801780511	S-11219347-111120-AMC-060	GP-35-1	Soil	6	8	11/11/2020	11:00	X				Field duplicate of sample S-11219347-111120-AMC-059
4801780511	S-11219347-111120-AMC-061	GP-35-1	Soil	8	10	11/11/2020	11:00	X				
4801780511	S-11219347-111120-AMC-062	GP-35-1	Soil	10	12	11/11/2020	11:00	X				
4801780511	S-11219347-111120-AMC-063	GP-35-1	Soil	12	14	11/11/2020	11:00	X				
4801780511	S-11219347-111120-AMC-064	GP-35-1	Soil	14	15.9	11/11/2020	11:00	X				
4801780511	S-11219347-111120-AMC-065	GP-30-1	Soil	4.5	6	11/11/2020	13:00	X				
4801780511	S-11219347-111120-AMC-066	GP-30-1	Soil	6	8	11/11/2020	13:00	X				
4801780511	S-11219347-111120-AMC-067	GP-30-1	Soil	8	10	11/11/2020	13:00	X				
4801780511	S-11219347-111120-AMC-068	GP-30-1	Soil	10	12	11/11/2020	13:00	X				
4801780511	S-11219347-111120-AMC-069	GP-30-1	Soil	12	14	11/11/2020	13:00	X				
4801780511	S-11219347-111120-AMC-070	GP-30-1	Soil	14	16.6	11/11/2020	13:00	X				
4801780511	S-11219347-111120-AMC-072	GP-24-1	Soil	7	9	11/11/2020	15:00	X				
4801780511	S-11219347-111120-AMC-073	GP-24-1	Soil	9	11	11/11/2020	15:00	X				
4801780511	S-11219347-111120-AMC-074	GP-24-1	Soil	11	13	11/11/2020	15:00	X				
4801780511	S-11219347-111120-AMC-075	GP-24-1	Soil	13	15	11/11/2020	15:00	X				
4801780511	S-11219347-111120-AMC-076	GP-24-1	Soil	15	16.1	11/11/2020	15:00	X				
4801780521	S-11219347-111120-AMC-052	GP-33-1	Soil	5	7	11/11/2020	09:15	X				
4801781901	S-11219347-111320-AMC-102	GP-38	Soil	8.5	10	11/13/2020	08:30	X				
4801781901	S-11219347-111320-AMC-103	GP-38	Soil	10	12	11/13/2020	08:30	X				
4801781901	S-11219347-111320-AMC-104	GP-38	Soil	10	12	11/13/2020	08:30	X				Field duplicate of sample S-11219347-111320-AMC-103
4801781901	S-11219347-111320-AMC-105	GP-38	Soil	12	14	11/13/2020	08:30	X				
4801781901	S-11219347-111320-AMC-106	GP-38	Soil	14	16.2	11/13/2020	08:30	X				
4801781901	S-11219347-111320-AMC-107	GP-39	Soil	9	11	11/13/2020	10:00	X				
4801781901	S-11219347-111320-AMC-108	GP-39	Soil	11	13	11/13/2020	10:00	X				
4801781901	S-11219347-111320-AMC-109	GP-39	Soil	13	15	11/13/2020	10:00	X				
4801781901	S-11219347-111320-AMC-110	GP-39	Soil	15	15.9	11/13/2020	10:00	X				
4801781901	S-11219347-111320-AMC-111	GP-42	Soil	9	11	11/13/2020	11:30	X				
4801781901	S-11219347-111320-AMC-112	GP-42	Soil	11	13	11/13/2020	11:30	X				
4801781901	S-11219347-111320-AMC-113	GP-42	Soil	13	15	11/13/2020	11:30	X				
4801781901	S-11219347-111320-AMC-114	GP-42	Soil	15	16.4	11/13/2020	11:30	X				
4801781901	S-11219347-111320-AMC-116	GP-44	Soil	12	14	11/13/2020	14:00	X				
4801781901	S-11219347-111320-AMC-117	GP-44	Soil	14	15.8	11/13/2020	14:00	X				
4801781901	S-11219347-111320-AMC-118	GP-44	Soil	15.6	15.8	11/13/2020	14:00				X	
4801781901	S-11219347-111320-AMC-119	GP-8-1	Soil	9.5	11	11/13/2020	15:30	X				
4801781901	S-11219347-111320-AMC-120	GP-8-1	Soil	9.5	11	11/13/2020	15:30	X				
4801781901	S-11219347-111320-AMC-121	GP-8-1	Soil	11	13	11/13/2020	15:30	X				
4801781901	S-11219347-111320-AMC-122	GP-8-1	Soil	13	15	11/13/2020	15:30	X				
4801781901	S-11219347-111320-AMC-123	GP-8-1	Soil	15	16.1	11/13/2020	15:30	X				
4801781931	S-11219347-111220-AMC-079	GP-52	Soil	2	4	11/12/2020	08:20	X				
4801781931	S-11219347-111220-AMC-080	GP-52	Soil	2	4	11/12/2020	08:20	X				Field duplicate of sample S-11219347-111220-AMC-079
4801781931	S-11219347-111220-AMC-081	GP-50	Soil	4	4.6	11/12/2020	09:10	X				
4801781931	S-11219347-111220-AMC-082	GP-53	Soil	2	4	11/12/2020	09:30	X				
4801781931	S-11219347-111220-AMC-083	GP-53	Soil	4	5.6	11/12/2020	09:30	X				
4801781931	S-11219347-111220-AMC-084	GP-53	Soil	5	5.6	11/12/2020	09:30				X	

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Jenesis Leisure Living Site												
Buffalo, New York												
November-December 2020												
Sample Delivery Group	Sample Identification	Location	Matrix	Initial Sample Depth (ft. bgs)	Final Sample Depth (ft. bgs)	Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	Analysis/Parameters				Comments
								VOCs	TPH DRO/ORO	Specific Gravity	FOC	
4801781931	S-11219347-111220-AMC-085	GP-54	Soil	2.5	4	11/12/2020	10:30	X				
4801781931	S-11219347-111220-AMC-086	GP-54	Soil	4	5.2	11/12/2020	10:30	X				
4801781931	S-11219347-111220-AMC-090	GP-1-1	Soil	4	6	11/12/2020	12:20	X				
4801781931	S-11219347-111220-AMC-091	GP-1-1	Soil	6	8	11/12/2020	12:20	X				
4801781931	S-11219347-111220-AMC-092	GP-1-1	Soil	8	8.9	11/12/2020	12:20	X				
4801781931	S-11219347-111220-AMC-093	GP-7-1	Soil	8	10	11/12/2020	14:20	X				
4801781931	S-11219347-111220-AMC-094	GP-7-1	Soil	8	10	11/12/2020	14:20	X				Field duplicate of sample S-11219347-111220-AMC-093
4801781931	S-11219347-111220-AMC-095	GP-7-1	Soil	10	11.9	11/12/2020	14:20	X				
4801781931	S-11219347-111220-AMC-100	GP-56	Soil	8	10	11/12/2020	15:40	X				
4801781931	S-11219347-111220-AMC-101	GP-56	Soil	10	10.6	11/12/2020	15:40	X				
4801782451	S-11219347-111620-AMC-129	GP-19-1	Soil	6	8	11/16/2020	09:00	X				
4801782451	S-11219347-111620-AMC-130	GP-19-1	Soil	8	10	11/16/2020	09:00	X				
4801782451	S-11219347-111620-AMC-131	GP-19-1	Soil	10	12	11/16/2020	09:00	X				
4801782451	S-11219347-111620-AMC-132	GP-19-1	Soil	12	14	11/16/2020	09:00	X				
4801782451	S-11219347-111620-AMC-133	GP-19-1	Soil	14	16	11/16/2020	09:00	X				
4801782451	S-11219347-111620-AMC-134	GP-19-1	Soil	14	16	11/16/2020	09:00	X				Field duplicate of sample S-11219347-111620-AMC-133
4801782451	S-11219347-111620-AMC-135	GP-14-1	Soil	6	8	11/16/2020	10:30	X				
4801782451	S-11219347-111620-AMC-136	GP-14-1	Soil	8	10	11/16/2020	10:30	X				
4801782451	S-11219347-111620-AMC-137	GP-14-1	Soil	10	12	11/16/2020	10:30	X				
4801782451	S-11219347-111620-AMC-138	GP-14-1	Soil	12	14	11/16/2020	10:30	X				
4801782451	S-11219347-111620-AMC-139	GP-14-1	Soil	14	15.8	11/16/2020	10:30	X				
4801782451	S-11219347-111620-AMC-140	GP-C-1	Soil	6	8	11/16/2020	13:30	X				
4801782451	S-11219347-111620-AMC-141	GP-C-1	Soil	8	10	11/16/2020	13:30	X				
4801782451	S-11219347-111620-AMC-142	GP-C-1	Soil	10	12	11/16/2020	13:30	X				
4801782451	S-11219347-111620-AMC-143	GP-C-1	Soil	12	14	11/16/2020	13:30	X				
4801782451	S-11219347-111620-AMC-144	GP-C-1	Soil	14	15.7	11/16/2020	13:30	X				
4801782451	S-11219347-111620-AMC-145	GP-C-1	Soil	14.8	15.6	11/16/2020	13:30				X	
4801782451	S-11219347-111620-AMC-146	GP-23-1	Soil	6	8	11/16/2020	15:00	X				
4801782451	S-11219347-111620-AMC-147	GP-23-1	Soil	8	10	11/16/2020	15:00	X				
4801782451	S-11219347-111620-AMC-148	GP-23-1	Soil	8	10	11/16/2020	15:00	X				Field duplicate of sample S-11219347-111620-AMC-147
4801782451	S-11219347-111620-AMC-149	GP-23-1	Soil	10	12	11/16/2020	15:00	X				
4801782451	S-11219347-111620-AMC-150	GP-23-1	Soil	12	14	11/16/2020	15:00	X				
4801782451	S-11219347-111620-AMC-151	GP-23-1	Soil	14	16.4	11/16/2020	15:00	X				
4801783261	S-11219347-111720-AMC-156	GP-37	Soil	4	5	11/17/2020	08:30				X	
4801783261	S-11219347-111720-AMC-157	GP-37	Soil	6	8	11/17/2020	08:30	X				
4801783261	S-11219347-111720-AMC-158	GP-37	Soil	8	10	11/17/2020	08:30	X				
4801783261	S-11219347-111720-AMC-159	GP-37	Soil	10	12	11/17/2020	08:30	X				
4801783261	S-11219347-111720-AMC-160	GP-37	Soil	12	14	11/17/2020	08:30	X				
4801783261	S-11219347-111720-AMC-161	GP-37	Soil	14	15.1	11/17/2020	08:30	X				
4801783261	S-11219347-111720-AMC-162	GP-36	Soil	6	8	11/17/2020	09:30	X				
4801783261	S-11219347-111720-AMC-163	GP-36	Soil	8	10	11/17/2020	09:30	X				
4801783261	S-11219347-111720-AMC-164	GP-36	Soil	10	12	11/17/2020	09:30	X				
4801783261	S-11219347-111720-AMC-165	GP-36	Soil	12	14	11/17/2020	09:30	X				
4801783261	S-11219347-111720-AMC-166	GP-36	Soil	14	15.7	11/17/2020	09:30	X				
4801783261	S-11219347-111720-AMC-169	GP-67	Soil	2	4	11/17/2020	11:00	X				
4801783261	S-11219347-111720-AMC-170	GP-67	Soil	4	5.4	11/17/2020	11:00	X				
4801783261	S-11219347-111720-AMC-171	GP-67	Soil	4	5.4	11/17/2020	11:00				X	

Table 1

Sample Collection and Analysis Summary
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Sample Delivery Group	Sample Identification	Location	Matrix	Initial Sample Depth (ft. bgs)	Final Sample Depth (ft. bgs)	Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	Analysis/Parameters				Comments
								VOCs	TPH DRO/ORO	Specific Gravity	FOC	
4801783261	S-11219347-111720-AMC-172	GP-68	Soil	2	4	11/17/2020	11:30	X				
4801783261	S-11219347-111720-AMC-173	GP-68	Soil	4	6	11/17/2020	11:30	X				
4801783261	S-11219347-111720-AMC-174	GP-68	Soil	6	7.4	11/17/2020	11:30	X				
4801783781	S-11219347-111820-AMC-179	GP-69	Soil	8	9.8	11/18/2020	07:40	X				
4801783781	S-11219347-111820-AMC-181	GP-47	Soil	2.8	4.6	11/18/2020	09:15	X				
4801783781	S-11219347-111820-AMC-182	GP-47	Soil	2.8	4.6	11/18/2020	09:15	X				Field duplicate of sample S-11219347-111820-AMC-181
4801783781	S-11219347-111820-AMC-183	GP-48	Soil	4	5.4	11/18/2020	09:45	X				
4801783781	S-11219347-111820-AMC-184	GP-55	Soil	5	6.8	11/18/2020	10:30	X				
4801785251	S-11219347-112020-AMC-189	MW-106	Soil	0.5	2	11/20/2020	14:00	X				
4801785251	S-11219347-112020-AMC-190	MW-106	Soil	2	4	11/20/2020	14:00	X				
4801785251	S-11219347-112020-AMC-191	MW-106	Soil	4	6	11/20/2020	14:00	X				
4801785251	S-11219347-112020-AMC-192	MW-106	Soil	6	8	11/20/2020	14:00	X				
4801785251	S-11219347-112020-AMC-193	MW-106	Soil	8	10	11/20/2020	14:00	X				
4801785251	S-11219347-112020-AMC-194	MW-106	Soil	8	10	11/20/2020	14:00	X				Field duplicate of sample S-11219347-112020-AMC-193
4801785251	S-11219347-112020-AMC-195	MW-106	Soil	10	12	11/20/2020	14:00	X				
4801785251	S-11219347-112020-AMC-196	MW-106	Soil	12	14	11/20/2020	14:00	X				
4801786651	S-11219347-112420-AMC-198	GP-64	Soil	8	10	11/24/2020	14:30	X				
4801786651	S-11219347-112420-AMC-199	GP-64	Soil	10	11.8	11/24/2020	14:30	X				
4801786651	S-11219347-112420-AMC-200	GP-58	Soil	6	8	11/24/2020	15:20	X				
4801786651	S-11219347-112420-AMC-201	GP-58	Soil	8	10	11/24/2020	15:20	X				
4801786651	S-11219347-112420-AMC-202	GP-58	Soil	10	11.6	11/24/2020	15:20	X				
4801787431	S-11219347-112020-AMC-197	MW-106	Soil	14	16	11/20/2020	14:00	X				
4801787431	S-11219347-112520-AMC-203	GP-49	Soil	8	10	11/25/2020	08:00	X				
4801787431	S-11219347-112520-AMC-204	GP-49	Soil	10	12	11/25/2020	08:00	X				
4801787431	S-11219347-112520-AMC-205	GP-49	Soil	12	14	11/25/2020	08:00	X				
4801787431	S-11219347-112520-AMC-206	GP-49	Soil	14	16.3	11/25/2020	08:00	X				
4801787431	S-11219347-112520-AMC-207	GP-49	Soil	14	16.3	11/25/2020	08:00	X				Field duplicate of sample S-11219347-112520-AMC-206
4801787431	S-11219347-112520-AMC-208	MW-109	Soil	0	2	11/25/2020	09:15	X				
4801787431	S-11219347-112520-AMC-209	MW-109	Soil	2	4	11/25/2020	09:15	X				
4801787431	S-11219347-112520-AMC-210	MW-109	Soil	6	8	11/25/2020	09:15	X				
4801787431	S-11219347-112520-AMC-211	MW-109	Soil	8	10	11/25/2020	09:15	X				
4801787431	S-11219347-112520-AMC-212	MW-109	Soil	10	10.7	11/25/2020	09:15	X				
4801788021	S-11219347-113020-AMC-215	MW-110	Soil	0	2	11/30/2020	10:40	X				
4801788021	S-11219347-113020-AMC-216	MW-110	Soil	2	4	11/30/2020	10:40	X				
4801788021	S-11219347-113020-AMC-217	MW-110	Soil	4	6	11/30/2020	10:40	X				
4801788601	S-11219347-120120-AMC-218	MW-107	Soil	0.5	2	12/01/2020	10:00	X				
4801788601	S-11219347-120120-AMC-219	MW-107	Soil	2	4	12/01/2020	10:00	X				
4801788601	S-11219347-120120-AMC-220	MW-107	Soil	4	6	12/01/2020	10:00	X				
4801788601	S-11219347-120120-AMC-221	MW-107	Soil	6	8	12/01/2020	10:00	X				
4801788601	S-11219347-120120-AMC-222	MW-107	Soil	8	10	12/01/2020	10:00	X				
4801788601	S-11219347-120120-AMC-223	MW-107	Soil	10	12	12/01/2020	10:00	X			X	
4801788601	S-11219347-120120-AMC-224	MW-107	Soil	12	14	12/01/2020	10:00	X				
4801788601	S-11219347-120120-AMC-225	MW-107	Soil	14	16.2	12/01/2020	10:00	X				
4801789161	S-11219347-120220-AMC-226	MW-108	Soil	0.5	2	12/02/2020	11:00	X				
4801789161	S-11219347-120220-AMC-227	MW-108	Soil	2	4	12/02/2020	11:00	X				
4801789161	S-11219347-120220-AMC-228	MW-108	Soil	4	6	12/02/2020	11:00	X				
4801789161	S-11219347-120220-AMC-229	MW-108	Soil	6	8	12/02/2020	11:00	X				

Table 1

Sample Collection and Analysis Summary
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Sample Delivery Group	Sample Identification	Location	Matrix	Initial Sample Depth (ft. bgs)	Final Sample Depth (ft. bgs)	Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	Analysis/Parameters				Comments
								VOCs	TPH DRO/ORO	Specific Gravity	FOC	
4801789161	S-11219347-120220-AMC-230	MW-108	Soil	8	10	12/02/2020	11:00	X				
4801789161	S-11219347-120220-AMC-231	MW-108	Soil	10	12	12/02/2020	11:00	X				
4801789161	S-11219347-120220-AMC-232	MW-108	Soil	12	14	12/02/2020	11:00	X				
4801789161	S-11219347-120220-AMC-233	MW-108	Soil	14	15.9	12/02/2020	11:00	X				
4801779691	TB-11219347-110920-AMC-001	-	Water	-	-	11/09/2020	14:00	X				Trip Blank
4801779691	TB-11219347-111020-AMC-002	-	Water	-	-	11/10/2020	15:00	X				Trip Blank
4801779691	WG-11219347-110920-AMC-009	GP-61	Groundwater	-	-	11/09/2020	12:50	X				
4801779691	WG-11219347-110920-AMC-016	GP-63	Groundwater	-	-	11/09/2020	15:40	X				
4801779691	WG-11219347-111020-AMC-037	GP-62	Groundwater	-	-	11/10/2020	12:00	X				
4801779691	WG-11219347-111020-AMC-039	GP-57	Groundwater	-	-	11/10/2020	12:30	X				
4801779691	WG-11219347-111020-AMC-040	GP-51	Groundwater	-	-	11/10/2020	12:40	X				
4801779691	WG-11219347-111020-AMC-041	GP-45	Groundwater	-	-	11/10/2020	13:00	X				
4801780511	TB-11219347-111120-AMC-003	-	Water	-	-	11/11/2020	08:00	X				Trip Blank
4801780511	WG-11219347-111120-AMC-049	GP-31-1	Groundwater	-	-	11/11/2020	07:30	X				
4801780511	WG-11219347-111120-AMC-050	GP-40	Groundwater	-	-	11/11/2020	07:40	X				
4801780511	WG-11219347-111120-AMC-071	GP-33-1	Groundwater	-	-	11/11/2020	14:00	X				
4801780511	WG-11219347-111120-AMC-077	GP-30-1	Groundwater	-	-	11/11/2020	15:20	X				
4801780511	WG-11219347-111120-AMC-078	GP-30-1	Groundwater	-	-	11/11/2020	15:30	X				Field duplicate of sample WG-11219347-111120-AMC-077
4801781901	TB-11219347-111320-AMC-005	-	Water	-	-	11/13/2020	11:00	X				Trip Blank
4801781901	WG-11219347-111320-AMC-115	GP-38	Groundwater	-	-	11/13/2020	10:55	X				
4801781901	WG-11219347-111320-AMC-124	GP-39	Groundwater	-	-	11/13/2020	14:20	X				
4801781901	WG-11219347-111320-AMC-125	GP-48	Groundwater	-	-	11/13/2020	14:30	X				
4801781901	WG-11219347-111320-AMC-126	GP-53	Groundwater	-	-	11/13/2020	14:40	X				
4801781901	WG-11219347-111320-AMC-127	GP-56	Groundwater	-	-	11/13/2020	14:50	X				
4801781901	WG-11219347-111320-AMC-128	GP-7-1	Groundwater	-	-	11/13/2020	15:00	X				
4801781931	TB-11219347-111220-AMC-004	-	Water	-	-	11/12/2020	11:30	X				Trip Blank
4801781931	WG-11219347-111220-AMC-087	GP-52	Groundwater	-	-	11/12/2020	11:00	X				
4801781931	WG-11219347-111220-AMC-088	GP-50	Groundwater	-	-	11/12/2020	11:10	X				
4801781931	WG-11219347-111220-AMC-089	GP-24-1	Groundwater	-	-	11/12/2020	12:00	X				
4801781931	WG-11219347-111220-AMC-096	GP-54	Groundwater	-	-	11/12/2020	13:30	X				
4801781931	WG-11219347-111220-AMC-097	GP-55	Groundwater	-	-	11/12/2020	13:55	X				
4801781931	WG-11219347-111220-AMC-098	GP-1-1	Groundwater	-	-	11/12/2020	14:00	X				
4801781931	WG-11219347-111220-AMC-099	GP-35-1	Groundwater	-	-	11/12/2020	14:15	X				
4801782451	RB-11219347-111620-AMC-001	-	Water	-	-	11/16/2020	08:15	X				Rinse Blank
4801782451	RB-11219347-111620-AMC-002	-	Water	-	-	11/16/2020	15:30	X				Rinse Blank
4801782451	TB-11219347-111620-AMC-006	-	Water	-	-	11/16/2020	08:30	X				Trip Blank
4801782451	WG-11219347-111620-AMC-152	GP-8-1	Groundwater	-	-	11/16/2020	16:00	X				
4801782451	WG-11219347-111620-AMC-153	GP-8-1	Groundwater	-	-	11/16/2020	16:05	X				Field duplicate of sample WG-11219347-111620-AMC-152
4801783261	RB-11219347-111720-AMC-003	-	Water	-	-	11/17/2020	10:45	X				Rinse Blank
4801783261	RB-11219347-111720-AMC-004	-	Water	-	-	11/17/2020	14:40	X				Rinse Blank
4801783261	TB-11219347-111720-AMC-007	-	Water	-	-	11/17/2020	11:30	X				Trip Blank
4801783261	WG-11219347-111720-AMC-154	GP-44	Groundwater	-	-	11/17/2020	07:30	X				
4801783261	WG-11219347-111720-AMC-155	GP-19-1	Groundwater	-	-	11/17/2020	07:40	X				
4801783261	WG-11219347-111720-AMC-167	GP-C-1	Groundwater	-	-	11/17/2020	10:30	X				
4801783261	WG-11219347-111720-AMC-168	GP-14-1	Groundwater	-	-	11/17/2020	10:40	X				
4801783261	WG-11219347-111720-AMC-175	GP-23-1	Groundwater	-	-	11/17/2020	12:00	X				
4801783261	WG-11219347-111720-AMC-176	GP-36	Groundwater	-	-	11/17/2020	13:00	X				

Table 1

Sample Collection and Analysis Summary
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Sample Delivery Group	Sample Identification	Location	Matrix	Initial Sample Depth (ft. bgs)	Final Sample Depth (ft. bgs)	Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	Analysis/Parameters				Comments
								VOCs	TPH DRO/ORO	Specific Gravity	FOC	
4801783261	WG-11219347-111720-AMC-177	GP-68	Groundwater	-	-	11/17/2020	14:30	X				
4801783781	RB-11219347-111820-AMC-005	-	Water	-	-	11/18/2020	09:30	X				Rinse Blank
4801783781	TB-11219347-111820-AMC-008	-	Water	-	-	11/18/2020	09:30	X				Trip Blank
4801783781	WG-11219347-111820-AMC-178	GP-37	Groundwater	-	-	11/18/2020	07:20	X				
4801783781	WG-11219347-111820-AMC-180	GP-69	Groundwater	-	-	11/18/2020	07:50	X				
4801783781	WG-11219347-111820-AMC-185	MW-105	Groundwater	-	-	11/18/2020	16:30	X				
4801785251	TB-11219347-112020-AMC-010	-	Water	-	-	11/20/2020	10:50	X				Trip Blank
4801785251	WG-11219347-112020-AMC-188	MW-102	Groundwater	-	-	11/20/2020	10:50	X				
4801785331	P-11219347-111920-JDA-01	MW-103	Groundwater	-	-	11/19/2020	09:00	X	X	X		
4801785481	RB-11219347-111920-AMC-006	-	Water	-	-	11/19/2020	10:20	X				Rinse Blank
4801785481	TB-11219347-111920-AMC-009	-	Water	-	-	11/19/2020	10:00	X				Trip Blank
4801785481	WG-11219347-111920-AMC-186	MW-105	Groundwater	-	-	11/19/2020	09:45	X				
4801785481	WG-11219347-111920-AMC-187	MW-102	Groundwater	-	-	11/19/2020	14:30	X				
4801787431	TB-11219347-112520-AMC-011	-	Water	-	-	11/25/2020	14:45	X				Trip Blank
4801787431	WG-11219347-112520-AMC-213	GP-64	Groundwater	-	-	11/25/2020	14:00	X				
4801787431	WG-11219347-112520-AMC-214	GP-49	Groundwater	-	-	11/25/2020	14:15	X				
4801788601	RB-11219347-120120-AMC-007	-	Water	-	-	12/01/2020	13:30	X				Rinse Blank
4801788601	TB-11219347-120120-AMC-012	-	Water	-	-	12/01/2020	13:30	X				Trip Blank
4801789161	RB-11219347-120220-AMC-008	-	Water	-	-	12/02/2020	12:00	X				Rinse Blank
4801789161	TB-11219347-120220-AMC-013	-	Water	-	-	12/02/2020	12:00	X				Trip Blank
4801790101	TB-11219347-120420-AMC-014	-	Water	-	-	12/04/2020	11:00	X				Trip Blank
4801790101	WG-11219347-120420-AMC-234	MW-109	Groundwater	-	-	12/04/2020	11:00	X				
4801790101	WG-11219347-120420-AMC-235	MW-110	Groundwater	-	-	12/04/2020	11:10	X				
4801790101	WG-11219347-120420-AMC-236	MW-110	Groundwater	-	-	12/04/2020	11:20	X				Field duplicate of sample WG-11219347-120420-AMC-235
4801790101	WG-11219347-120420-AMC-237	MW-106	Groundwater	-	-	12/04/2020	12:00	X				
4801790101	WG-11219347-120420-AMC-238	MW-107	Groundwater	-	-	12/04/2020	12:20	X				
4801790101	WG-11219347-120420-AMC-239	MW-108	Water	-	-	12/04/2020	12:40	X				

Notes:

- ft. bgs - Feet Below Ground Surface
- VOCs - Volatile Organic Compounds
- TPH - Total Petroleum Hydrocarbon
- DRO - Diesel Range Organics
- ORO - Oil Range Organics
- FOC - Fraction Organic Carbon
- - Not applicable

Table 2A

Analytical Results Summary
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Location ID: Sample Name: Sample Date:		GP-1-1 WG-11219347-1111220-AMC-098 11/12/2020	GP-14-1 WG-11219347-1111720-AMC-168 11/17/2020	GP-19-1 WG-11219347-1111720-AMC-155 11/17/2020	GP-23-1 WG-11219347-1111720-AMC-175 11/17/2020	GP-24-1 WG-11219347-1111220-AMC-089 11/12/2020	GP-30-1 WG-11219347-1111120-AMC-077 11/11/2020
Parameters	Unit						
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/L	6700	2100	2000 U	140	400 U	23
1,1,2,2-Tetrachloroethane	µg/L	400 U	1000 U	2000 U	40 U	400 U	5.0 U
1,1,2-Trichloroethane	µg/L	400 U	1000 U	2000 U	40 U	400 U	5.0 U
1,1-Dichloroethane	µg/L	400 U	1000 U	2000 U	65	400 U	9.8
1,1-Dichloroethene	µg/L	1700	980 J	1700 J	180	580	23
1,2,4-Trichlorobenzene	µg/L	400 U	1000 U	2000 U	40 U	400 U	5.0 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	400 U	1000 U	2000 U	40 U	400 U	5.0 U
1,2-Dibromoethane (Ethylene dibromide)	µg/L	400 U	1000 U	2000 U	40 U	400 U	5.0 U
1,2-Dichlorobenzene	µg/L	400 U	1000 U	2000 U	40 U	400 U	5.0 U
1,2-Dichloroethane	µg/L	400 U	1000 U	2000 U	40 U	400 U	5.0 U
1,2-Dichloropropane	µg/L	400 U	1000 U	2000 U	40 U	400 U	5.0 U
1,3-Dichlorobenzene	µg/L	400 U	1000 U	2000 U	40 U	400 U	5.0 U
1,4-Dichlorobenzene	µg/L	400 U	1000 U	2000 U	40 U	400 U	5.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	4000 U	10000 U	20000 U	400 U	4000 U	50 U
2-Hexanone	µg/L	2000 U	5000 U	10000 U	200 U	2000 U	25 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	2000 U	5000 U	10000 U	200 U	2000 U	25 U
Acetone	µg/L	4000 U	10000 U	20000 U	400 U	4000 U	50 U
Benzene	µg/L	400 U	1000 U	2000 U	40 U	400 U	5.0 U
Bromodichloromethane	µg/L	400 U	1000 U	2000 U	40 U	400 U	5.0 U
Bromoform	µg/L	400 U	1000 U	2000 U	40 U	400 U	5.0 U
Bromomethane (Methyl bromide)	µg/L	400 U	1000 U	2000 U	40 U	400 U	5.0 U
Carbon disulfide	µg/L	400 U	540 J	2000 U	22 J	400 U	5.0 U
Carbon tetrachloride	µg/L	400 U	1000 U	2000 U	40 U	400 U	5.0 U
Chlorobenzene	µg/L	400 U	1000 U	2000 U	40 U	400 U	5.0 U
Chloroethane	µg/L	400 U	1000 U	2000 U	40 U	400 U	5.0 U
Chloroform (Trichloromethane)	µg/L	400 U	1000 U	2000 U	40 U	400 U	5.0 U
Chloromethane (Methyl chloride)	µg/L	400 U	1000 U	2000 U	40 U	400 U	5.0 U
cis-1,2-Dichloroethene	µg/L	510	1000 U	2000 U	52	500	11
cis-1,3-Dichloropropene	µg/L	400 U	1000 U	2000 U	40 U	400 U	5.0 U
Cyclohexane	µg/L	400 U	1000 U	2000 U	40 U	400 U	5.0 U
Dibromochloromethane	µg/L	400 U	1000 U	2000 U	40 U	400 U	5.0 U
Dichlorodifluoromethane (CFC-12)	µg/L	400 U	1000 U	2000 U	40 U	400 U	5.0 U
Ethylbenzene	µg/L	400 U	1000 U	2000 U	40 U	400 U	5.0 U
Isopropyl benzene	µg/L	400 U	1000 U	2000 U	40 U	400 U	5.0 U
Methyl acetate	µg/L	1000 U	2500 U	5000 U	100 U	1000 U	13 U
Methyl cyclohexane	µg/L	400 U	1000 U	2000 U	40 U	400 U	5.0 U
Methyl tert butyl ether (MTBE)	µg/L	400 U	1000 U	2000 UJ	40 U	400 U	5.0 U
Methylene chloride	µg/L	400 U	1000 U	2000 U	40 U	400 U	5.0 U
Styrene	µg/L	400 U	1000 U	2000 U	40 U	400 U	5.0 U
Tetrachloroethene	µg/L	400 U	1000 U	2000 U	40 U	400 U	5.0 U
Toluene	µg/L	400 U	1000 U	2000 U	40 U	400 U	5.0 U
trans-1,2-Dichloroethene	µg/L	400 U	1000 U	2000 U	40 U	400 U	5.0 U
trans-1,3-Dichloropropene	µg/L	400 U	1000 U	2000 U	40 U	400 U	5.0 U
Trichloroethene	µg/L	33000	45000	52000 J	2000	16000	320
Trichlorofluoromethane (CFC-11)	µg/L	400 U	1000 U	2000 U	40 U	400 U	5.0 U
Trifluorotrichloroethane (CFC-113)	µg/L	400 U	1000 U	2000 U	40 U	400 U	5.0 U
Vinyl chloride	µg/L	400 U	1000 U	2000 U	40 U	400 U	5.0 U
Xylenes (total)	µg/L	800 U	2000 U	4000 U	80 U	800 U	10 U

Notes:
J - Estimated concentration
U - Not detected at the associated reporting limit
UJ - Not detected; associated reporting limit is estimated

Table 2A

Analytical Results Summary
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Location ID: Sample Name: Sample Date:		GP-30-1 WG-11219347-111120-AMC-078 11/11/2020 Duplicate	GP-31-1 WG-11219347-111120-AMC-049 11/11/2020	GP-33-1 WG-11219347-111120-AMC-071 11/11/2020	GP-35-1 WG-11219347-111220-AMC-099 11/12/2020	GP-36 WG-11219347-111720-AMC-176 11/17/2020	GP-37 WG-11219347-111820-AMC-178 11/18/2020
Parameters	Unit						
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/L	23	4.0 U	170	1.8	10 U	4.3 J
1,1,2,2-Tetrachloroethane	µg/L	5.0 U	4.0 U	50 U	1.0 U	10 U	5.0 U
1,1,2-Trichloroethane	µg/L	5.0 U	4.0 U	50 U	1.0 U	10 U	5.0 U
1,1-Dichloroethane	µg/L	9.3	3.5 J	140	2.0	13	6.9
1,1-Dichloroethene	µg/L	22	4.0 U	250	1.3	27	5.8
1,2,4-Trichlorobenzene	µg/L	5.0 U	4.0 U	50 U	1.0 U	10 U	5.0 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	5.0 U	4.0 U	50 U	1.0 U	10 U	5.0 U
1,2-Dibromoethane (Ethylene dibromide)	µg/L	5.0 U	4.0 U	50 U	1.0 U	10 U	5.0 U
1,2-Dichlorobenzene	µg/L	5.0 U	4.0 U	50 U	1.0 U	10 U	5.0 U
1,2-Dichloroethane	µg/L	5.0 U	4.0 U	50 U	1.0 U	10 U	5.0 U
1,2-Dichloropropane	µg/L	5.0 U	4.0 U	50 U	1.0 U	10 U	5.0 U
1,3-Dichlorobenzene	µg/L	5.0 U	4.0 U	50 U	1.0 U	10 U	5.0 U
1,4-Dichlorobenzene	µg/L	5.0 U	4.0 U	50 U	1.0 U	10 U	5.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	50 U	40 U	500 U	2.9 J	100 U	50 U
2-Hexanone	µg/L	25 U	20 U	250 U	5.0 U	50 U	25 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	25 U	20 U	250 U	5.0 U	50 U	25 U
Acetone	µg/L	50 U	40 U	500 U	15	100 U	50 U
Benzene	µg/L	5.0 U	4.0 U	50 U	1.0 U	10 U	5.0 U
Bromodichloromethane	µg/L	5.0 U	4.0 U	50 U	1.0 U	10 U	5.0 U
Bromoform	µg/L	5.0 U	4.0 U	50 U	1.0 U	10 U	5.0 U
Bromomethane (Methyl bromide)	µg/L	5.0 U	4.0 U	50 U	1.0 U	10 U	5.0 U
Carbon disulfide	µg/L	5.0 U	4.0 U	50 U	1.0 U	4.9 J	5.0 U
Carbon tetrachloride	µg/L	5.0 U	4.0 U	50 U	1.0 U	10 U	5.0 U
Chlorobenzene	µg/L	5.0 U	4.0 U	50 U	1.0 U	10 U	5.0 U
Chloroethane	µg/L	5.0 U	4.0 U	50 U	1.0 U	10 U	5.0 U
Chloroform (Trichloromethane)	µg/L	5.0 U	4.0 U	50 U	1.0 U	10 U	5.0 U
Chloromethane (Methyl chloride)	µg/L	5.0 U	4.0 U	50 U	1.0 U	10 U	5.0 U
cis-1,2-Dichloroethene	µg/L	8.9	11	360	8.1	17	8.0
cis-1,3-Dichloropropene	µg/L	5.0 U	4.0 U	50 U	1.0 U	10 U	5.0 U
Cyclohexane	µg/L	5.0 U	4.0 U	50 U	1.0 U	10 U	5.0 U
Dibromochloromethane	µg/L	5.0 U	4.0 U	50 U	1.0 U	10 U	5.0 U
Dichlorodifluoromethane (CFC-12)	µg/L	5.0 U	4.0 U	50 U	1.0 U	10 U	5.0 U
Ethylbenzene	µg/L	5.0 U	4.0 U	50 U	1.0 U	10 U	5.0 U
Isopropyl benzene	µg/L	5.0 U	4.0 U	50 U	1.0 U	10 U	5.0 U
Methyl acetate	µg/L	13 U	10 U	130 U	2.5 U	25 U	13 U
Methyl cyclohexane	µg/L	5.0 U	4.0 U	50 U	1.0 U	10 U	5.0 U
Methyl tert butyl ether (MTBE)	µg/L	5.0 U	4.0 U	50 UJ	1.0 U	10 U	5.0 UJ
Methylene chloride	µg/L	5.0 U	4.0 U	50 U	1.0 U	10 U	5.0 U
Styrene	µg/L	5.0 U	4.0 U	50 U	1.0 U	10 U	5.0 U
Tetrachloroethene	µg/L	5.0 U	4.0 U	50 U	1.0 U	10 U	5.0 U
Toluene	µg/L	5.0 U	4.0 U	50 U	1.0 U	10 U	5.0 U
trans-1,2-Dichloroethene	µg/L	5.0 U	4.0 U	50 U	1.0 U	10 U	5.0 U
trans-1,3-Dichloropropene	µg/L	5.0 U	4.0 U	50 U	1.0 U	10 U	5.0 U
Trichloroethene	µg/L	330	33	2700 J	24	320	110
Trichlorofluoromethane (CFC-11)	µg/L	5.0 U	4.0 U	50 U	1.0 U	10 U	5.0 U
Trifluorotrichloroethane (CFC-113)	µg/L	5.0 U	4.0 U	50 U	1.0 U	10 U	5.0 U
Vinyl chloride	µg/L	5.0 U	4.0 U	50 U	1.0 U	10 U	5.0 U
Xylenes (total)	µg/L	10 U	8.0 U	100 U	2.0 U	20 U	10 U

Notes:
J - Estimated concentration
U - Not detected at the associated reporting limit
UJ - Not detected; associated reporting limit is estimated

Table 2A

Analytical Results Summary
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Location ID: Sample Name: Sample Date:		GP-38 WG-11219347-111320-AMC-115 11/13/2020	GP-39 WG-11219347-111320-AMC-124 11/13/2020	GP-40 WG-11219347-111120-AMC-050 11/11/2020	GP-44 WG-11219347-1111720-AMC-154 11/17/2020	GP-45 WG-11219347-1111020-AMC-041 11/10/2020	GP-48 WG-11219347-111320-AMC-125 11/13/2020
Parameters	Unit						
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/L	32	110	5.6	160	60	4100
1,1,2,2-Tetrachloroethane	µg/L	20 U	20 U	2.0 U	20 U	2.0 U	50 U
1,1,2-Trichloroethane	µg/L	20 U	20 U	2.0 U	20 U	2.0 U	50 U
1,1-Dichloroethane	µg/L	120	12 J	2.5	14 J	21	88
1,1-Dichloroethene	µg/L	100	36	15	44	150	470
1,2,4-Trichlorobenzene	µg/L	20 U	20 U	2.0 U	20 U	2.0 U	50 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	20 U	20 U	2.0 U	20 U	2.0 U	50 U
1,2-Dibromoethane (Ethylene dibromide)	µg/L	20 U	20 U	2.0 U	20 U	2.0 U	50 U
1,2-Dichlorobenzene	µg/L	20 U	20 U	2.0 U	20 U	2.0 U	50 U
1,2-Dichloroethane	µg/L	20 U	20 U	2.0 U	20 U	2.0 U	50 U
1,2-Dichloropropane	µg/L	20 U	20 U	2.0 U	20 U	2.0 U	50 U
1,3-Dichlorobenzene	µg/L	20 U	20 U	2.0 U	20 U	2.0 U	50 U
1,4-Dichlorobenzene	µg/L	20 U	20 U	2.0 U	20 U	2.0 U	50 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	200 U	200 U	20 U	200 U	20 U	500 U
2-Hexanone	µg/L	100 U	100 U	10 U	100 U	10 U	250 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	100 U	100 U	10 U	100 U	10 U	250 U
Acetone	µg/L	200 U	200 U	11 J	200 U	20 U	500 U
Benzene	µg/L	20 U	20 U	2.0 U	20 U	1.4 J	50 U
Bromodichloromethane	µg/L	20 U	20 U	2.0 U	20 U	2.0 U	50 U
Bromoform	µg/L	20 U	20 U	2.0 U	20 U	2.0 U	50 U
Bromomethane (Methyl bromide)	µg/L	20 U	20 U	2.0 U	20 U	2.0 U	50 U
Carbon disulfide	µg/L	20 U	20 U	2.0 U	12 J	2.0 U	50 U
Carbon tetrachloride	µg/L	20 U	20 U	2.0 U	20 U	2.0 U	50 U
Chlorobenzene	µg/L	20 U	20 U	2.0 U	20 U	2.0 U	50 U
Chloroethane	µg/L	20 U	20 U	2.0 U	20 U	2.0 U	50 U
Chloroform (Trichloromethane)	µg/L	20 U	20 U	2.0 U	20 U	3.4	50 U
Chloromethane (Methyl chloride)	µg/L	20 U	20 U	2.0 U	20 U	2.0 U	50 U
cis-1,2-Dichloroethene	µg/L	1300	23	7.6	52	4.2	570
cis-1,3-Dichloropropene	µg/L	20 U	20 U	2.0 U	20 U	2.0 U	50 U
Cyclohexane	µg/L	20 U	20 U	2.0 U	20 U	1.1 J	50 U
Dibromochloromethane	µg/L	20 U	20 U	2.0 U	20 U	2.0 U	50 U
Dichlorodifluoromethane (CFC-12)	µg/L	20 U	20 U	2.0 U	20 U	2.0 U	50 U
Ethylbenzene	µg/L	20 U	20 U	2.0 U	20 U	2.0 U	50 U
Isopropyl benzene	µg/L	20 U	20 U	2.0 U	20 U	2.0 U	50 U
Methyl acetate	µg/L	50 U	50 U	5.0 U	50 U	5.0 U	130 U
Methyl cyclohexane	µg/L	20 U	20 U	2.0 U	20 U	1.2 J	50 U
Methyl tert butyl ether (MTBE)	µg/L	20 U	20 U	2.0 U	20 U	2.0 U	50 U
Methylene chloride	µg/L	20 U	20 U	2.0 U	20 U	2.0 U	50 U
Styrene	µg/L	20 U	20 U	2.0 U	20 U	2.0 U	50 U
Tetrachloroethene	µg/L	20 U	20 U	2.0 U	20 U	2.0 U	50 U
Toluene	µg/L	20 U	20 U	25	20 U	2.6	50 U
trans-1,2-Dichloroethene	µg/L	20 U	20 U	2.0 U	20 U	2.0 U	50 U
trans-1,3-Dichloropropene	µg/L	20 U	20 U	2.0 U	20 U	2.0 U	50 U
Trichloroethene	µg/L	790	930	74	580	37	4300
Trichlorofluoromethane (CFC-11)	µg/L	20 U	20 U	2.0 U	20 U	2.0 U	50 U
Trifluorotrichloroethane (CFC-113)	µg/L	20 U	20 U	2.0 U	20 U	2.0 U	50 U
Vinyl chloride	µg/L	20 U	20 U	2.0 U	20 U	2.0 U	50 U
Xylenes (total)	µg/L	40 U	40 U	4.0 U	40 U	4.0 U	100 U

Notes:
J - Estimated concentration
U - Not detected at the associated reporting limit
UJ - Not detected; associated reporting limit is estimated

Table 2A

Analytical Results Summary
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Location ID: Sample Name: Sample Date:		GP-49 WG-11219347-112520-AMC-214 11/25/2020	GP-50 WG-11219347-111220-AMC-088 11/12/2020	GP-51 WG-11219347-111020-AMC-040 11/10/2020	GP-52 WG-11219347-111220-AMC-087 11/12/2020	GP-53 WG-11219347-111320-AMC-126 11/13/2020	GP-54 WG-11219347-111220-AMC-096 11/12/2020
Parameters	Unit						
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/L	4.0 U	21	10	10 U	4.0 U	610
1,1,2,2-Tetrachloroethane	µg/L	4.0 U	4.0 U	8.0 U	10 U	4.0 U	20 U
1,1,2-Trichloroethane	µg/L	4.0 U	4.0 U	8.0 U	10 U	4.0 U	20 U
1,1-Dichloroethane	µg/L	4.0 U	3.1 J	8.0 U	10 U	12	56
1,1-Dichloroethene	µg/L	4.0 U	4.0 U	3.5 J	10 U	4.0 U	78
1,2,4-Trichlorobenzene	µg/L	4.0 U	4.0 U	8.0 U	10 U	4.0 U	20 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	4.0 U	4.0 U	8.0 U	10 U	4.0 U	20 U
1,2-Dibromoethane (Ethylene dibromide)	µg/L	4.0 U	4.0 U	8.0 U	10 U	4.0 U	20 U
1,2-Dichlorobenzene	µg/L	4.0 U	4.0 U	8.0 U	10 U	4.0 U	20 U
1,2-Dichloroethane	µg/L	4.0 U	4.0 U	8.0 U	10 U	2.5 J	20 U
1,2-Dichloropropane	µg/L	4.0 U	4.0 U	8.0 U	10 U	4.0 U	20 U
1,3-Dichlorobenzene	µg/L	4.0 U	4.0 U	8.0 U	10 U	4.0 U	20 U
1,4-Dichlorobenzene	µg/L	4.0 U	4.0 U	8.0 U	10 U	4.0 U	20 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	40 U	40 U	80 U	14 J	40 U	200 U
2-Hexanone	µg/L	20 U	20 U	40 U	50 U	20 U	100 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	20 U	20 U	40 U	50 U	20 U	100 U
Acetone	µg/L	25 J	15 J	80 U	37 J	19 J	200 U
Benzene	µg/L	4.0 U	4.0 U	8.0 U	10 U	4.0 U	20 U
Bromodichloromethane	µg/L	4.0 U	4.0 U	8.0 U	10 U	4.0 U	20 U
Bromoform	µg/L	4.0 U	4.0 U	8.0 U	10 U	4.0 U	20 U
Bromomethane (Methyl bromide)	µg/L	4.0 U	4.0 U	8.0 U	10 U	4.0 U	20 U
Carbon disulfide	µg/L	4.0 U	4.0 U	8.0 U	10 U	4.0 U	20 U
Carbon tetrachloride	µg/L	4.0 U	4.0 U	8.0 U	10 U	4.0 U	20 U
Chlorobenzene	µg/L	4.0 U	4.0 U	8.0 U	10 U	4.0 U	20 U
Chloroethane	µg/L	4.0 U	4.0 U	8.0 U	10 U	4.0 U	20 U
Chloroform (Trichloromethane)	µg/L	4.0 U	4.0 U	8.0 U	10 U	4.0 U	20 U
Chloromethane (Methyl chloride)	µg/L	4.0 U	4.0 U	8.0 U	10 U	4.0 U	20 U
cis-1,2-Dichloroethene	µg/L	4.0 U	4.0 U	8.0 U	10 U	70	280
cis-1,3-Dichloropropene	µg/L	4.0 U	4.0 U	8.0 U	10 U	4.0 U	20 U
Cyclohexane	µg/L	4.0 U	4.0 U	8.0 U	10 U	4.0 U	20 U
Dibromochloromethane	µg/L	4.0 U	4.0 U	8.0 U	10 U	4.0 U	20 U
Dichlorodifluoromethane (CFC-12)	µg/L	4.0 U	4.0 U	8.0 U	10 U	4.0 U	20 U
Ethylbenzene	µg/L	4.0 U	4.0 U	8.0 U	10 U	4.0 U	20 U
Isopropyl benzene	µg/L	4.0 U	4.0 U	8.0 U	10 U	4.0 U	20 U
Methyl acetate	µg/L	10 U	10 U	20 U	25 U	10 U	50 U
Methyl cyclohexane	µg/L	4.0 U	4.0 U	8.0 U	10 U	4.0 U	20 U
Methyl tert butyl ether (MTBE)	µg/L	4.0 U	4.0 U	8.0 U	10 U	4.0 U	20 U
Methylene chloride	µg/L	4.0 U	4.0 U	8.0 U	10 U	4.0 U	20 U
Styrene	µg/L	4.0 U	4.0 U	8.0 U	10 U	4.0 U	20 U
Tetrachloroethene	µg/L	4.0 U	4.0 U	8.0 U	10 U	4.0 U	20 U
Toluene	µg/L	4.0 U	4.0 U	8.0 U	10 U	4.0 U	20 U
trans-1,2-Dichloroethene	µg/L	4.0 U	4.0 U	8.0 U	10 U	4.0 U	20 U
trans-1,3-Dichloropropene	µg/L	4.0 U	4.0 U	8.0 U	10 U	4.0 U	20 U
Trichloroethene	µg/L	22	8.5	56	10 U	4.6	630
Trichlorofluoromethane (CFC-11)	µg/L	4.0 U	4.0 U	8.0 U	10 U	4.0 U	20 U
Trifluorotrichloroethane (CFC-113)	µg/L	4.0 U	4.0 U	8.0 U	10 U	4.0 U	20 U
Vinyl chloride	µg/L	4.0 U	4.0 U	8.0 U	10 U	26	20 U
Xylenes (total)	µg/L	8.0 U	8.0 U	16 U	20 U	8.0 U	40 U

Notes:
J - Estimated concentration
U - Not detected at the associated reporting limit
UJ - Not detected; associated reporting limit is estimated

Table 2A

Analytical Results Summary
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Location ID: Sample Name: Sample Date:		GP-55 WG-11219347-111220-AMC-097 11/12/2020	GP-56 WG-11219347-111320-AMC-127 11/13/2020	GP-57 WG-11219347-111020-AMC-039 11/10/2020	GP-61 WG-11219347-110920-AMC-009 11/09/2020	GP-62 WG-11219347-111020-AMC-037 11/10/2020	GP-63 WG-11219347-110920-AMC-016 11/09/2020
Parameters	Unit						
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/L	160	39	6.7	90	4300	4.7
1,1,2,2-Tetrachloroethane	µg/L	25 U	10 U	1.0 U	25 U	100 U	1.0 U
1,1,2-Trichloroethane	µg/L	25 U	10 U	1.0 U	25 U	100 U	1.0 U
1,1-Dichloroethane	µg/L	460	11	2.9	110	100	19
1,1-Dichloroethene	µg/L	190	15	0.78 J	30	1300	1.2
1,2,4-Trichlorobenzene	µg/L	25 U	10 U	1.0 U	25 U	100 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	25 U	10 U	1.0 U	25 U	100 U	1.0 U
1,2-Dibromoethane (Ethylene dibromide)	µg/L	25 U	10 U	1.0 U	25 U	100 U	1.0 U
1,2-Dichlorobenzene	µg/L	25 U	10 U	1.0 U	25 U	100 U	1.0 U
1,2-Dichloroethane	µg/L	25 U	10 U	1.0 U	25 U	100 U	1.0 U
1,2-Dichloropropane	µg/L	25 U	10 U	1.0 U	25 U	100 U	1.0 U
1,3-Dichlorobenzene	µg/L	25 U	10 U	1.0 U	25 U	100 U	1.0 U
1,4-Dichlorobenzene	µg/L	25 U	10 U	1.0 U	25 U	100 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	250 U	100 U	10 U	250 U	1000 U	8.4 J
2-Hexanone	µg/L	130 U	50 U	5.0 U	130 U	500 U	5.0 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	130 U	50 U	5.0 U	130 U	500 U	5.0 U
Acetone	µg/L	250 U	30 J	10 U	250 U	1000 U	16
Benzene	µg/L	25 U	10 U	1.0 U	25 U	100 U	1.0 U
Bromodichloromethane	µg/L	25 U	10 U	1.0 U	25 U	100 U	1.0 U
Bromoform	µg/L	25 U	10 U	1.0 U	25 U	100 U	1.0 U
Bromomethane (Methyl bromide)	µg/L	25 U	10 U	1.0 U	25 U	100 U	1.0 U
Carbon disulfide	µg/L	25 U	10 U	1.0 U	25 U	100 U	0.35 J
Carbon tetrachloride	µg/L	25 U	10 U	1.0 U	25 U	100 U	1.0 U
Chlorobenzene	µg/L	25 U	10 U	1.0 U	25 U	100 U	1.0 U
Chloroethane	µg/L	25 U	10 U	1.0 U	25 U	100 U	1.0
Chloroform (Trichloromethane)	µg/L	25 U	10 U	0.37 J	25 U	100 U	1.0 U
Chloromethane (Methyl chloride)	µg/L	25 U	10 U	1.0 U	25 U	100 U	1.0 U
cis-1,2-Dichloroethene	µg/L	1200	82	4.0	240	520	35
cis-1,3-Dichloropropene	µg/L	25 U	10 U	1.0 U	25 U	100 U	1.0 U
Cyclohexane	µg/L	25 U	10 U	1.0 U	25 U	100 U	1.0 U
Dibromochloromethane	µg/L	25 U	10 U	1.0 U	25 U	100 U	1.0 U
Dichlorodifluoromethane (CFC-12)	µg/L	25 U	10 U	1.0 U	25 U	100 U	1.0 U
Ethylbenzene	µg/L	25 U	10 U	1.0 U	25 U	100 U	1.0 U
Isopropyl benzene	µg/L	25 U	10 U	1.0 U	25 U	100 U	1.0 U
Methyl acetate	µg/L	63 U	25 U	2.5 U	63 U	250 U	2.5 U
Methyl cyclohexane	µg/L	25 U	10 U	1.0 U	25 U	100 U	1.0 U
Methyl tert butyl ether (MTBE)	µg/L	25 U	10 U	1.0 U	25 U	100 U	1.0 U
Methylene chloride	µg/L	25 U	10 U	1.0 U	25 U	100 U	1.0 U
Styrene	µg/L	25 U	10 U	1.0 U	25 U	100 U	1.0 U
Tetrachloroethene	µg/L	25 U	10 U	1.0 U	25 U	100 U	1.0 U
Toluene	µg/L	39	10 U	1.0 U	25 U	100 U	1.0 U
trans-1,2-Dichloroethene	µg/L	25 U	12	1.0 U	25 U	100 U	56
trans-1,3-Dichloropropene	µg/L	25 U	10 U	1.0 U	25 U	100 U	1.0 U
Trichloroethene	µg/L	98	560	23	66	4900	10
Trichlorofluoromethane (CFC-11)	µg/L	25 U	10 U	1.0 U	25 U	100 U	1.0 U
Trifluorotrichloroethane (CFC-113)	µg/L	25 U	10 U	1.0 U	25 U	100 U	1.0 U
Vinyl chloride	µg/L	57	72	1.0 U	60	100 U	17
Xylenes (total)	µg/L	50 U	20 U	2.0 U	50 U	200 U	2.0 U

Notes:
J - Estimated concentration
U - Not detected at the associated reporting limit
UJ - Not detected; associated reporting limit is estimated

Table 2A

Analytical Results Summary
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Location ID: Sample Name: Sample Date:		GP-64 WG-11219347-112520-AMC-213 11/25/2020	GP-68 WG-11219347-111720-AMC-177 11/17/2020	GP-69 WG-11219347-111820-AMC-180 11/18/2020	GP-7-1 WG-11219347-111320-AMC-128 11/13/2020	GP-8-1 WG-11219347-111620-AMC-152 11/16/2020	GP-8-1 WG-11219347-111620-AMC-153 11/16/2020 Duplicate
Parameters	Unit						
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/L	2.3	2100	4.0 U	6700	2200	1900
1,1,2,2-Tetrachloroethane	µg/L	2.0 U	50 U	4.0 U	1000 U	200 U	200 U
1,1,2-Trichloroethane	µg/L	2.0 U	50 U	4.0 U	1000 U	200 U	200 U
1,1-Dichloroethane	µg/L	5.2	190	12	1000 U	180 J	150 J
1,1-Dichloroethene	µg/L	1.5 J	830	4.0 U	1000 U	1200	960
1,2,4-Trichlorobenzene	µg/L	2.0 U	50 U	4.0 U	1000 U	200 U	200 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	2.0 U	50 U	4.0 U	1000 U	200 U	200 U
1,2-Dibromoethane (Ethylene dibromide)	µg/L	2.0 U	50 U	4.0 U	1000 U	200 U	200 U
1,2-Dichlorobenzene	µg/L	2.0 U	50 U	4.0 U	1000 U	200 U	200 U
1,2-Dichloroethane	µg/L	2.0 U	50 U	4.0 U	1000 U	200 U	200 U
1,2-Dichloropropane	µg/L	2.0 U	50 U	4.0 U	1000 U	200 U	200 U
1,3-Dichlorobenzene	µg/L	2.0 U	50 U	4.0 U	1000 U	200 U	200 U
1,4-Dichlorobenzene	µg/L	2.0 U	50 U	4.0 U	1000 U	200 U	200 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	20 U	500 U	40 U	10000 U	2000 U	2000 U
2-Hexanone	µg/L	10 U	250 U	20 U	5000 U	1000 U	1000 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	10 U	250 U	20 U	5000 U	1000 U	1000 U
Acetone	µg/L	20 U	500 U	40 U	10000 U	2000 U	2000 U
Benzene	µg/L	2.0 U	50 U	4.0 U	1000 U	200 U	200 U
Bromodichloromethane	µg/L	2.0 U	50 U	4.0 U	1000 U	200 U	200 U
Bromoform	µg/L	2.0 U	50 U	4.0 U	1000 U	200 U	200 U
Bromomethane (Methyl bromide)	µg/L	2.0 U	50 U	4.0 U	1000 U	200 U	200 U
Carbon disulfide	µg/L	2.0 U	26 J	4.0 U	1000 U	200 U	200 U
Carbon tetrachloride	µg/L	2.0 U	50 U	4.0 U	1000 U	200 U	200 U
Chlorobenzene	µg/L	2.0 U	50 U	4.0 U	1000 U	200 U	200 U
Chloroethane	µg/L	2.0 U	50 U	4.0 U	1000 U	200 U	200 U
Chloroform (Trichloromethane)	µg/L	2.0 U	50 U	4.0 U	1000 U	200 U	200 U
Chloromethane (Methyl chloride)	µg/L	2.0 U	50 U	4.0 U	1000 U	200 U	200 U
cis-1,2-Dichloroethene	µg/L	11	980	32	1000 U	600	510
cis-1,3-Dichloropropene	µg/L	2.0 U	50 U	4.0 U	1000 U	200 U	200 U
Cyclohexane	µg/L	2.0 U	50 U	4.0 U	1000 U	200 U	200 U
Dibromochloromethane	µg/L	2.0 U	50 U	4.0 U	1000 U	200 U	200 U
Dichlorodifluoromethane (CFC-12)	µg/L	2.0 U	50 U	4.0 U	1000 U	200 U	200 U
Ethylbenzene	µg/L	2.0 U	50 U	4.0 U	1000 U	200 U	200 U
Isopropyl benzene	µg/L	2.0 U	50 U	4.0 U	1000 U	200 U	200 U
Methyl acetate	µg/L	5.0 U	130 U	10 U	2500 U	500 U	500 U
Methyl cyclohexane	µg/L	0.49 J	50 U	4.0 U	1000 U	200 U	200 U
Methyl tert butyl ether (MTBE)	µg/L	2.0 U	50 U	4.0 UJ	1000 U	200 U	200 U
Methylene chloride	µg/L	2.0 U	50 U	4.0 U	1000 U	200 U	200 U
Styrene	µg/L	2.0 U	50 U	4.0 U	1000 U	200 U	200 U
Tetrachloroethene	µg/L	2.0 U	50 U	4.0 U	1000 U	200 U	200 U
Toluene	µg/L	2.0 U	50 U	4.0 U	1000 U	200 U	200 U
trans-1,2-Dichloroethene	µg/L	2.0 U	50 U	11	1000 U	200 U	200 U
trans-1,3-Dichloropropene	µg/L	2.0 U	50 U	4.0 U	1000 U	200 U	200 U
Trichloroethene	µg/L	14	2900	41	65000	11000	9100
Trichlorofluoromethane (CFC-11)	µg/L	2.0 U	50 U	4.0 U	1000 U	200 U	200 U
Trifluorotrichloroethane (CFC-113)	µg/L	2.0 U	50 U	4.0 U	1000 U	200 U	200 U
Vinyl chloride	µg/L	2.5	98	9.4	1000 U	200 U	200 U
Xylenes (total)	µg/L	4.0 U	100 U	8.0 U	2000 U	400 U	400 U

Notes:
J - Estimated concentration
U - Not detected at the associated reporting limit
UJ - Not detected; associated reporting limit is estimated

Table 2A

Analytical Results Summary
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Location ID: Sample Name: Sample Date:		GP-C-1 WG-11219347-111720-AMC-167 11/17/2020	MW-102 WG-11219347-111920-AMC-187 11/19/2020	MW-102 WG-11219347-112020-AMC-188 11/20/2020	MW-105 WG-11219347-111820-AMC-185 11/18/2020	MW-105 WG-11219347-111920-AMC-186 11/19/2020	MW-106 WG-11219347-120420-AMC-237 12/04/2020
Parameters	Unit						
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/L	39000	5400	10000	130	380	130
1,1,2,2-Tetrachloroethane	µg/L	2000 U	1000 U	1000 U	10 U	100 U	25 U
1,1,2-Trichloroethane	µg/L	2000 U	1000 U	1000 U	10 U	100 U	25 U
1,1-Dichloroethane	µg/L	760 J	1700	1800	27	56 J	34
1,1-Dichloroethene	µg/L	15000	1300	2000	40	100	51
1,2,4-Trichlorobenzene	µg/L	2000 U	1000 U	1000 U	10 U	100 U	25 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	2000 U	1000 U	1000 U	10 U	100 U	25 U
1,2-Dibromoethane (Ethylene dibromide)	µg/L	2000 U	1000 U	1000 U	10 U	100 U	25 U
1,2-Dichlorobenzene	µg/L	2000 U	1000 U	1000 U	10 U	100 U	25 U
1,2-Dichloroethane	µg/L	2000 U	1000 U	1000 U	10 U	100 U	25 U
1,2-Dichloropropane	µg/L	2000 U	1000 U	1000 U	10 U	100 U	25 U
1,3-Dichlorobenzene	µg/L	2000 U	1000 U	1000 U	10 U	100 U	25 U
1,4-Dichlorobenzene	µg/L	2000 U	1000 U	1000 U	10 U	100 U	25 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	20000 U	10000 U	10000 U	100 U	1000 U	250 U
2-Hexanone	µg/L	10000 U	5000 U	5000 U	50 U	500 U	130 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	10000 U	5000 U	5000 U	50 U	500 U	130 U
Acetone	µg/L	20000 U	10000 U	10000 U	100 U	1000 U	250 U
Benzene	µg/L	2000 U	1000 U	1000 U	10 U	100 U	25 U
Bromodichloromethane	µg/L	2000 U	1000 U	1000 U	10 U	100 U	25 U
Bromoform	µg/L	2000 U	1000 U	1000 U	10 U	100 U	25 U
Bromomethane (Methyl bromide)	µg/L	2000 U	1000 U	1000 U	10 U	100 U	25 U
Carbon disulfide	µg/L	1800 J	1000 U	1000 U	10 U	100 U	25 U
Carbon tetrachloride	µg/L	2000 U	1000 U	1000 U	10 U	100 U	25 U
Chlorobenzene	µg/L	2000 U	1000 U	1000 U	10 U	100 U	25 U
Chloroethane	µg/L	2000 U	1000 U	1000 U	10 U	100 U	25 U
Chloroform (Trichloromethane)	µg/L	2000 U	1000 U	1000 U	10 U	100 U	25 U
Chloromethane (Methyl chloride)	µg/L	2000 U	1000 U	1000 U	10 U	100 U	25 U
cis-1,2-Dichloroethene	µg/L	2000 U	4700	11000	260	520	160
cis-1,3-Dichloropropene	µg/L	2000 U	1000 U	1000 U	10 U	100 U	25 U
Cyclohexane	µg/L	2000 U	1000 U	1000 U	10 U	100 U	7.5 J
Dibromochloromethane	µg/L	2000 U	1000 U	1000 U	10 U	100 U	25 U
Dichlorodifluoromethane (CFC-12)	µg/L	2000 U	1000 U	1000 U	10 U	100 U	25 U
Ethylbenzene	µg/L	2000 U	1000 U	1000 U	10 U	100 U	25 U
Isopropyl benzene	µg/L	2000 U	1000 U	1000 U	10 U	100 U	25 U
Methyl acetate	µg/L	5000 U	2500 U	2500 U	25 U	250 U	63 U
Methyl cyclohexane	µg/L	2000 U	1000 U	1000 U	10 U	100 U	9.8 J
Methyl tert butyl ether (MTBE)	µg/L	2000 U	1000 UJ	1000 U	10 UJ	100 UJ	25 U
Methylene chloride	µg/L	2000 U	1000 U	1000 U	10 U	100 U	25 U
Styrene	µg/L	2000 U	1000 U	1000 U	10 U	100 U	25 U
Tetrachloroethene	µg/L	2000 U	1000 U	1000 U	10 U	100 U	25 U
Toluene	µg/L	2000 U	1000 U	1000 U	10 U	100 U	25 U
trans-1,2-Dichloroethene	µg/L	2000 U	1000 U	1000 U	10 U	100 U	25 U
trans-1,3-Dichloropropene	µg/L	2000 U	1000 U	1000 U	10 U	100 U	25 U
Trichloroethene	µg/L	190000	70000	29000	810	3000	1700
Trichlorofluoromethane (CFC-11)	µg/L	2000 U	1000 U	1000 U	10 U	100 U	25 U
Trifluorotrichloroethane (CFC-113)	µg/L	2000 U	1000 U	1000 U	10 U	100 U	25 U
Vinyl chloride	µg/L	2000 U	1000 U	1000 U	10 U	100 U	25 U
Xylenes (total)	µg/L	4000 U	2000 U	2000 U	20 U	200 U	50 U

Notes:
J - Estimated concentration
U - Not detected at the associated reporting limit
UJ - Not detected; associated reporting limit is estimated

Table 2A						
Analytical Results Summary						
Pre-Design Investigation						
Jenesis Leisure Living Site						
Buffalo, New York						
November-December 2020						
Location ID:	MW-107	MW-108	MW-109	MW-110	MW-110	
Sample Name:	WG-11219347-120420-AMC-238	WG-11219347-120420-AMC-239	WG-11219347-120420-AMC-234	WG-11219347-120420-AMC-235	WG-11219347-120420-AMC-236	
Sample Date:	12/04/2020	12/04/2020	12/04/2020	12/04/2020	12/04/2020	Duplicate
Parameters	Unit					
Volatile Organic Compounds						
1,1,1-Trichloroethane	µg/L	50000	170	490000	4000 U	4000 U
1,1,2,2-Tetrachloroethane	µg/L	2000 U	80 U	20000 U	4000 U	4000 U
1,1,2-Trichloroethane	µg/L	2000 U	80 U	20000 U	4000 U	4000 U
1,1-Dichloroethane	µg/L	1500 J	80 U	20000 U	1600 J	1700 J
1,1-Dichloroethene	µg/L	7200	53 J	43000	2600 J	4000 U
1,2,4-Trichlorobenzene	µg/L	2000 U	80 U	20000 U	4000 U	4000 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	2000 U	80 U	20000 U	4000 U	4000 U
1,2-Dibromoethane (Ethylene dibromide)	µg/L	2000 U	80 U	20000 U	4000 U	4000 U
1,2-Dichlorobenzene	µg/L	2000 U	80 U	20000 U	4000 U	4000 U
1,2-Dichloroethane	µg/L	2000 U	80 U	20000 U	4000 U	4000 U
1,2-Dichloropropane	µg/L	2000 U	80 U	20000 U	4000 U	4000 U
1,3-Dichlorobenzene	µg/L	2000 U	80 U	20000 U	4000 U	4000 U
1,4-Dichlorobenzene	µg/L	2000 U	80 U	20000 U	4000 U	4000 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	20000 U	800 U	200000 U	40000 U	40000 U
2-Hexanone	µg/L	10000 U	400 U	100000 U	20000 U	20000 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	10000 U	400 U	100000 U	20000 U	20000 U
Acetone	µg/L	20000 U	800 U	200000 U	40000 U	40000 U
Benzene	µg/L	2000 U	80 U	20000 U	4000 U	4000 U
Bromodichloromethane	µg/L	2000 U	80 U	20000 U	4000 U	4000 U
Bromoform	µg/L	2000 U	80 U	20000 U	4000 U	4000 U
Bromomethane (Methyl bromide)	µg/L	2000 U	80 U	20000 U	4000 U	4000 U
Carbon disulfide	µg/L	2000 U	80 U	20000 U	4000 U	4000 U
Carbon tetrachloride	µg/L	2000 U	80 U	20000 U	4000 U	4000 U
Chlorobenzene	µg/L	2000 U	80 U	20000 U	4000 U	4000 U
Chloroethane	µg/L	2000 U	80 U	20000 U	4000 U	4000 U
Chloroform (Trichloromethane)	µg/L	2000 U	80 U	20000 U	4000 U	4000 U
Chloromethane (Methyl chloride)	µg/L	2000 U	80 U	20000 U	4000 U	4000 U
cis-1,2-Dichloroethene	µg/L	2000 U	200	20000 U	31000	31000
cis-1,3-Dichloropropene	µg/L	2000 U	80 U	20000 U	4000 U	4000 U
Cyclohexane	µg/L	2000 U	80 U	20000 U	4000 U	4000 U
Dibromochloromethane	µg/L	2000 U	80 U	20000 U	4000 U	4000 U
Dichlorodifluoromethane (CFC-12)	µg/L	2000 U	80 U	20000 U	4000 U	4000 U
Ethylbenzene	µg/L	2000 U	80 U	20000 U	4000 U	4000 U
Isopropyl benzene	µg/L	2000 U	80 U	20000 U	4000 U	4000 U
Methyl acetate	µg/L	5000 U	200 U	50000 U	10000 U	10000 U
Methyl cyclohexane	µg/L	2000 U	80 U	20000 U	4000 U	4000 U
Methyl tert butyl ether (MTBE)	µg/L	2000 U	80 U	20000 U	4000 U	4000 U
Methylene chloride	µg/L	2000 U	80 U	20000 U	4000 U	4000 U
Styrene	µg/L	2000 U	80 U	20000 U	4000 U	4000 U
Tetrachloroethene	µg/L	2000 U	80 U	20000 U	4000 U	4000 U
Toluene	µg/L	2000 U	80 U	20000 U	4000 U	4000 U
trans-1,2-Dichloroethene	µg/L	2000 U	80 U	20000 U	4000 U	4000 U
trans-1,3-Dichloropropene	µg/L	2000 U	80 U	20000 U	4000 U	4000 U
Trichloroethene	µg/L	200000	2400	280000	130000	130000
Trichlorofluoromethane (CFC-11)	µg/L	2000 U	80 U	20000 U	4000 U	4000 U
Trifluorotrichloroethane (CFC-113)	µg/L	2000 U	80 U	20000 U	4000 U	4000 U
Vinyl chloride	µg/L	2000 U	80 U	20000 U	4000 U	4000 U
Xylenes (total)	µg/L	4000 U	160 U	40000 U	8000 U	8000 U
Notes:						
J - Estimated concentration						
U - Not detected at the associated reporting limit						
UJ - Not detected; associated reporting limit is estimated						

Table 2B

Analytical Results Summary
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Location ID: Sample Name: Sample Date: Depth:		GP-1-1 S-11219347-111220-AMC-090 11/12/2020 4-6 ft. bgs	GP-1-1 S-11219347-111220-AMC-091 11/12/2020 6-8 ft. bgs	GP-1-1 S-11219347-111220-AMC-092 11/12/2020 8-8.9 ft. bgs	GP-14-1 S-11219347-111620-AMC-135 11/16/2020 6-8 ft. bgs	GP-14-1 S-11219347-111620-AMC-136 11/16/2020 8-10 ft. bgs	GP-14-1 S-11219347-111620-AMC-137 11/16/2020 10-12 ft. bgs
Parameters	Unit						
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/kg	180 J	7000	31000	51 J	42 J	53
1,1,2,2-Tetrachloroethane	µg/kg	200 U	5600 U	5000 U	61 U	54 U	51 U
1,1,2-Trichloroethane	µg/kg	200 U	5600 U	5000 U	61 U	54 U	51 U
1,1-Dichloroethane	µg/kg	200 U	5600 U	5000 U	61 U	54 U	51 U
1,1-Dichloroethene	µg/kg	89 J	5600 U	2800 J	61 U	54 U	51 U
1,2,4-Trichlorobenzene	µg/kg	200 U	5600 U	5000 U	61 U	54 U	51 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	200 U	5600 U	5000 U	61 U	54 U	51 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	200 U	5600 U	5000 U	61 U	54 U	51 U
1,2-Dichlorobenzene	µg/kg	200 U	5600 U	5000 U	61 U	54 U	51 U
1,2-Dichloroethane	µg/kg	200 U	5600 U	5000 U	61 U	54 U	51 U
1,2-Dichloropropane	µg/kg	200 U	5600 U	5000 U	61 U	54 U	51 U
1,3-Dichlorobenzene	µg/kg	200 U	5600 U	5000 U	61 U	54 U	51 U
1,4-Dichlorobenzene	µg/kg	200 U	5600 U	5000 U	61 U	54 U	51 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	980 U	28000 U	25000 U	300 U	270 U	260 U
2-Hexanone	µg/kg	980 U	28000 U	25000 U	300 U	270 U	260 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	980 U	28000 U	25000 U	300 U	270 U	260 U
Acetone	µg/kg	980 U	28000 U	25000 U	300 U	270 U	260 U
Benzene	µg/kg	200 U	5600 U	5000 U	61 U	54 U	51 U
Bromodichloromethane	µg/kg	200 U	5600 U	5000 U	61 U	54 U	51 U
Bromoform	µg/kg	200 U	5600 U	5000 U	61 U	54 U	51 U
Bromomethane (Methyl bromide)	µg/kg	200 U	5600 U	5000 U	61 U	54 U	51 U
Carbon disulfide	µg/kg	200 U	5600 U	5000 U	61 U	54 U	51 U
Carbon tetrachloride	µg/kg	200 U	5600 U	5000 U	61 U	54 U	51 U
Chlorobenzene	µg/kg	200 U	5600 U	5000 U	61 U	54 U	51 U
Chloroethane	µg/kg	200 U	5600 U	5000 U	61 U	54 U	51 U
Chloroform (Trichloromethane)	µg/kg	200 U	5600 U	5000 U	61 U	54 U	51 U
Chloromethane (Methyl chloride)	µg/kg	200 U	5600 U	5000 U	61 U	54 U	51 U
cis-1,2-Dichloroethene	µg/kg	510	5600 U	5000 U	21 J	58	61
cis-1,3-Dichloropropene	µg/kg	200 U	5600 U	5000 U	61 U	54 U	51 U
Cyclohexane	µg/kg	200 U	5600 U	5000 U	61 U	54 U	51 U
Dibromochloromethane	µg/kg	200 U	5600 U	5000 U	61 U	54 U	51 U
Dichlorodifluoromethane (CFC-12)	µg/kg	200 U	5600 U	5000 U	61 U	54 U	51 U
Ethylbenzene	µg/kg	200 U	5600 U	5000 U	61 U	54 U	51 U
Isopropyl benzene	µg/kg	200 U	5600 U	5000 U	61 U	54 U	51 U
Methyl acetate	µg/kg	980 U	28000 U	25000 U	300 U	270 U	260 U
Methyl cyclohexane	µg/kg	200 U	5600 U	5000 U	61 U	54 U	51 U
Methyl tert butyl ether (MTBE)	µg/kg	200 U	5600 U	5000 U	61 U	54 U	51 U
Methylene chloride	µg/kg	200 U	5600 U	5000 U	61 U	21 J	51 U
Styrene	µg/kg	200 U	5600 U	5000 U	61 U	54 U	51 U
Tetrachloroethene	µg/kg	200 U	5600 U	5000 U	61 U	54 U	51 U
Toluene	µg/kg	200 U	5600 U	5000 U	61 U	18 J	51 U
trans-1,2-Dichloroethene	µg/kg	200 U	5600 U	5000 U	61 U	54 U	51 U
trans-1,3-Dichloropropene	µg/kg	200 U	5600 U	5000 U	61 U	54 U	51 U
Trichloroethene	µg/kg	9000	140000	170000	790	610	770
Trichlorofluoromethane (CFC-11)	µg/kg	200 U	5600 U	5000 U	61 U	54 U	51 U
Trifluorotrichloroethane (CFC-113)	µg/kg	200 U	5600 U	5000 U	61 U	54 U	51 U
Vinyl chloride	µg/kg	200 U	5600 U	5000 U	61 U	54 U	51 U
Xylenes (total)	µg/kg	390 U	11000 U	10000 U	120 U	110 U	100 U
General Chemistry							
Fraction organic carbon (FOC)	%	-	-	-	-	-	-
Notes:							
J - Estimated concentration							
U - Not detected at the associated reporting limit							
UJ - Not detected; associated reporting limit is estimated							
R - Rejected							
ft. bgs - Feet Below Ground Surface							
- = Not applicable							

Table 2B

Analytical Results Summary
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Location ID:		GP-14-1	GP-14-1	GP-19-1	GP-19-1	GP-19-1	GP-19-1
Sample Name:		S-11219347-111620-AMC-138	S-11219347-111620-AMC-139	S-11219347-111620-AMC-129	S-11219347-111620-AMC-130	S-11219347-111620-AMC-131	S-11219347-111620-AMC-132
Sample Date:		11/16/2020	11/16/2020	11/16/2020	11/16/2020	11/16/2020	11/16/2020
Depth:		12-14 ft. bgs	14-15.8 ft. bgs	6-8 ft. bgs	8-10 ft. bgs	10-12 ft. bgs	12-14 ft. bgs
Parameters	Unit						
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/kg	900	180	4500	11000	14000	5300
1,1,2,2-Tetrachloroethane	µg/kg	450 U	100 U	630 U	1000 U	1300 U	4600 U
1,1,2-Trichloroethane	µg/kg	450 U	100 U	630 U	1000 U	1300 U	4600 U
1,1-Dichloroethane	µg/kg	450 U	100 U	430 J	1000 U	1300 U	4600 U
1,1-Dichloroethene	µg/kg	450 U	180	2400	1700	3100	3600 J
1,2,4-Trichlorobenzene	µg/kg	450 U	100 U	630 U	1000 U	1300 U	4600 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	450 U	100 U	630 U	1000 U	1300 U	4600 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	450 U	100 U	630 U	1000 U	1300 U	4600 U
1,2-Dichlorobenzene	µg/kg	450 U	100 U	630 U	1000 U	1300 U	4600 U
1,2-Dichloroethane	µg/kg	450 U	100 U	630 U	1000 U	1300 U	4600 U
1,2-Dichloropropane	µg/kg	450 U	100 U	630 U	1000 U	1300 U	4600 U
1,3-Dichlorobenzene	µg/kg	450 U	100 U	630 U	1000 U	1300 U	4600 U
1,4-Dichlorobenzene	µg/kg	450 U	100 U	630 U	1000 U	1300 U	4600 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	2300 U	510 U	3200 U	5200 U	6500 U	23000 U
2-Hexanone	µg/kg	2300 U	510 U	3200 U	5200 U	6500 U	23000 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	2300 U	510 U	3200 U	5200 U	6500 U	23000 U
Acetone	µg/kg	2300 U	510 U	3200 U	5200 U	6500 U	23000 U
Benzene	µg/kg	450 U	100 U	630 U	1000 U	1300 U	4600 U
Bromodichloromethane	µg/kg	450 U	100 U	630 U	1000 U	1300 U	4600 U
Bromoform	µg/kg	450 U	100 U	630 U	1000 U	1300 U	4600 U
Bromomethane (Methyl bromide)	µg/kg	450 U	100 U	630 U	1000 U	1300 U	4600 U
Carbon disulfide	µg/kg	450 U	100 U	630 U	1000 U	1300 U	4600 U
Carbon tetrachloride	µg/kg	450 U	100 U	630 U	1000 U	1300 U	4600 U
Chlorobenzene	µg/kg	450 U	100 U	630 U	1000 U	1300 U	4600 U
Chloroethane	µg/kg	450 U	100 U	630 U	1000 U	1300 U	4600 U
Chloroform (Trichloromethane)	µg/kg	450 U	100 U	630 U	1000 U	1300 U	4600 U
Chloromethane (Methyl chloride)	µg/kg	450 U	100 U	630 U	1000 U	1300 U	4600 U
cis-1,2-Dichloroethene	µg/kg	450 U	29 J	600 J	480 J	740 J	4600 U
cis-1,3-Dichloropropene	µg/kg	450 U	100 U	630 U	1000 U	1300 U	4600 U
Cyclohexane	µg/kg	450 U	100 U	630 U	1000 U	1300 U	4600 U
Dibromochloromethane	µg/kg	450 U	100 U	630 U	1000 U	1300 U	4600 U
Dichlorodifluoromethane (CFC-12)	µg/kg	450 U	100 U	630 U	1000 U	1300 U	4600 U
Ethylbenzene	µg/kg	450 U	100 U	630 U	1000 U	1300 U	4600 U
Isopropyl benzene	µg/kg	450 U	100 U	630 U	1000 U	1300 U	4600 U
Methyl acetate	µg/kg	2300 U	510 U	3200 U	5200 U	6500 U	23000 U
Methyl cyclohexane	µg/kg	450 U	100 U	630 U	1000 U	1300 U	4600 U
Methyl tert butyl ether (MTBE)	µg/kg	450 U	100 U	630 U	1000 U	1300 U	4600 U
Methylene chloride	µg/kg	450 U	100 U	630 U	1000 U	1300 U	4600 U
Styrene	µg/kg	450 U	100 U	630 U	1000 U	1300 U	4600 U
Tetrachloroethene	µg/kg	450 U	35 J	630 U	1000 U	1300 U	4600 U
Toluene	µg/kg	450 U	100 U	630 U	1000 U	1300 U	4600 U
trans-1,2-Dichloroethene	µg/kg	450 U	100 U	630 U	1000 U	1300 U	4600 U
trans-1,3-Dichloropropene	µg/kg	450 U	100 U	630 U	1000 U	1300 U	4600 U
Trichloroethene	µg/kg	18000	4100	28000	28000	46000	130000
Trichlorofluoromethane (CFC-11)	µg/kg	450 U	100 U	630 U	1000 U	1300 U	4600 U
Trifluorotrichloroethane (CFC-113)	µg/kg	450 U	100 U	630 U	1000 U	1300 U	4600 U
Vinyl chloride	µg/kg	450 U	100 U	630 U	1000 U	1300 U	4600 U
Xylenes (total)	µg/kg	910 U	200 U	1300 U	2100 U	2600 U	9200 U
General Chemistry							
Fraction organic carbon (FOC)	%	-	-	-	-	-	-

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit
UJ - Not detected; associated reporting limit is estimated
R - Rejected
ft. bgs - Feet Below Ground Surface
- = Not applicable

Table 2B

Analytical Results Summary
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Location ID: Sample Name: Sample Date: Depth:		GP-19-1 S-11219347-111620-AMC-133 11/16/2020 14-16 ft. bgs	GP-19-1 S-11219347-111620-AMC-134 11/16/2020 14-16 ft. bgs Duplicate	GP-23-1 S-11219347-111620-AMC-146 11/16/2020 6-8 ft. bgs	GP-23-1 S-11219347-111620-AMC-147 11/16/2020 8-10 ft. bgs	GP-23-1 S-11219347-111620-AMC-148 11/16/2020 8-10 ft. bgs Duplicate	GP-23-1 S-11219347-111620-AMC-149 11/16/2020 10-12 ft. bgs
Parameters	Unit						
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/kg	78000 J	9400 J	50 UJ	41 J	56	61
1,1,2,2-Tetrachloroethane	µg/kg	48000 U	21000 U	50 U	49 U	48 U	49 U
1,1,2-Trichloroethane	µg/kg	48000 U	21000 U	50 U	49 U	48 U	49 U
1,1-Dichloroethane	µg/kg	48000 U	21000 U	50 U	49 U	48 U	49 U
1,1-Dichloroethene	µg/kg	24000 J	21000 U	50 UJ	49 U	48 U	49 U
1,2,4-Trichlorobenzene	µg/kg	48000 U	21000 U	50 UJ	49 U	48 U	49 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	48000 U	21000 U	50 U	49 U	48 U	49 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	48000 U	21000 U	50 U	49 U	48 U	49 U
1,2-Dichlorobenzene	µg/kg	48000 U	21000 U	50 UJ	49 U	48 U	49 U
1,2-Dichloroethane	µg/kg	48000 U	21000 U	50 U	49 U	48 U	49 U
1,2-Dichloropropane	µg/kg	48000 U	21000 U	50 U	49 U	48 U	49 U
1,3-Dichlorobenzene	µg/kg	48000 U	21000 U	50 UJ	49 U	48 U	49 U
1,4-Dichlorobenzene	µg/kg	48000 U	21000 U	50 UJ	49 U	48 U	49 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	240000 U	110000 U	250 U	250 U	240 U	250 U
2-Hexanone	µg/kg	240000 U	110000 U	250 U	250 U	240 U	250 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	240000 U	110000 U	250 U	250 U	240 U	250 U
Acetone	µg/kg	240000 U	110000 U	250 U	250 U	240 U	250 U
Benzene	µg/kg	48000 U	21000 U	50 UJ	49 U	48 U	49 U
Bromodichloromethane	µg/kg	48000 U	21000 U	50 U	49 U	48 U	49 U
Bromoform	µg/kg	48000 U	21000 U	50 U	49 U	48 U	49 U
Bromomethane (Methyl bromide)	µg/kg	48000 U	21000 U	50 UJ	49 U	48 U	49 U
Carbon disulfide	µg/kg	48000 U	21000 U	50 UJ	49 U	48 U	49 U
Carbon tetrachloride	µg/kg	48000 U	21000 U	50 UJ	49 U	48 U	49 U
Chlorobenzene	µg/kg	48000 U	21000 U	50 UJ	49 U	48 U	49 U
Chloroethane	µg/kg	48000 U	21000 U	50 UJ	49 U	48 U	49 U
Chloroform (Trichloromethane)	µg/kg	48000 U	21000 U	50 U	49 U	48 U	49 U
Chloromethane (Methyl chloride)	µg/kg	48000 U	21000 U	50 UJ	49 U	48 U	49 U
cis-1,2-Dichloroethene	µg/kg	48000 U	21000 U	48 J	32 J	29 J	49 U
cis-1,3-Dichloropropene	µg/kg	48000 U	21000 U	50 U	49 U	48 U	49 U
Cyclohexane	µg/kg	48000 U	21000 U	R	49 U	48 U	49 U
Dibromochloromethane	µg/kg	48000 U	21000 U	50 U	49 U	48 U	49 U
Dichlorodifluoromethane (CFC-12)	µg/kg	48000 U	21000 U	R	49 U	48 U	49 U
Ethylbenzene	µg/kg	48000 U	21000 U	50 UJ	49 U	48 U	49 U
Isopropyl benzene	µg/kg	48000 U	21000 U	50 UJ	49 U	48 U	49 U
Methyl acetate	µg/kg	240000 U	110000 U	250 U	250 U	240 U	250 U
Methyl cyclohexane	µg/kg	48000 U	21000 U	R	49 U	48 U	49 U
Methyl tert butyl ether (MTBE)	µg/kg	48000 U	21000 U	50 U	49 U	48 U	49 U
Methylene chloride	µg/kg	48000 U	21000 U	50 U	49 U	48 U	49 U
Styrene	µg/kg	48000 U	21000 U	50 UJ	49 U	48 U	49 U
Tetrachloroethene	µg/kg	48000 U	21000 U	50 UJ	49 U	48 U	49 U
Toluene	µg/kg	48000 U	21000 U	50 UJ	49 U	48 U	49 U
trans-1,2-Dichloroethene	µg/kg	48000 U	21000 U	50 UJ	49 U	48 U	49 U
trans-1,3-Dichloropropene	µg/kg	48000 U	21000 U	50 U	49 U	48 U	49 U
Trichloroethene	µg/kg	2200000 J	430000 J	490 J	460	690	760
Trichlorofluoromethane (CFC-11)	µg/kg	48000 U	21000 U	R	49 U	48 U	49 U
Trifluorotrichloroethane (CFC-113)	µg/kg	48000 U	21000 U	R	49 U	48 U	49 U
Vinyl chloride	µg/kg	48000 U	21000 U	R	49 U	48 U	49 U
Xylenes (total)	µg/kg	96000 U	42000 U	99 U	99 U	97 U	99 U
General Chemistry							
Fraction organic carbon (FOC)	%	-	-	-	-	-	-

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit
UJ - Not detected; associated reporting limit is estimated
R - Rejected
ft. bgs - Feet Below Ground Surface
- = Not applicable

Table 2B

Analytical Results Summary
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Location ID: Sample Name: Sample Date: Depth:		GP-23-1 S-11219347-111620-AMC-150 11/16/2020 12-14 ft. bgs	GP-23-1 S-11219347-111620-AMC-151 11/16/2020 14-16.4 ft. bgs	GP-24-1 S-11219347-111120-AMC-072 11/11/2020 7-9 ft. bgs	GP-24-1 S-11219347-111120-AMC-073 11/11/2020 9-11 ft. bgs	GP-24-1 S-11219347-111120-AMC-074 11/11/2020 11-13 ft. bgs	GP-24-1 S-11219347-111120-AMC-075 11/11/2020 13-15 ft. bgs
Parameters	Unit						
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/kg	74	29 J	23 J	23 J	15 J	410 J
1,1,2,2-Tetrachloroethane	µg/kg	49 U	45 U	57 U	49 U	47 U	480 U
1,1,2-Trichloroethane	µg/kg	49 U	45 U	57 U	49 U	47 U	480 U
1,1-Dichloroethane	µg/kg	49 U	45 U	57 U	49 U	47 U	480 U
1,1-Dichloroethene	µg/kg	49 U	27 J	57 U	49 U	47 U	510
1,2,4-Trichlorobenzene	µg/kg	49 U	45 U	57 U	49 U	47 U	480 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	49 U	45 U	57 U	49 U	47 U	480 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	49 U	45 U	57 U	49 U	47 U	480 U
1,2-Dichlorobenzene	µg/kg	49 U	45 U	57 U	49 U	47 U	480 U
1,2-Dichloroethane	µg/kg	49 U	45 U	57 U	49 U	47 U	480 U
1,2-Dichloropropane	µg/kg	49 U	45 U	57 U	49 U	47 U	480 U
1,3-Dichlorobenzene	µg/kg	49 U	45 U	57 U	49 U	47 U	480 U
1,4-Dichlorobenzene	µg/kg	49 U	45 U	57 U	49 U	47 U	480 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	240 U	230 U	290 U	250 U	230 U	2400 U
2-Hexanone	µg/kg	240 U	230 U	290 U	250 U	230 U	2400 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	240 U	230 U	290 U	250 U	230 U	2400 U
Acetone	µg/kg	240 U	230 U	290 U	250 U	230 U	2400 U
Benzene	µg/kg	49 U	45 U	57 U	49 U	47 U	480 U
Bromodichloromethane	µg/kg	49 U	45 U	57 U	49 U	47 U	480 U
Bromoform	µg/kg	49 U	45 U	57 U	49 U	47 U	480 U
Bromomethane (Methyl bromide)	µg/kg	49 U	45 U	57 U	49 U	47 U	480 U
Carbon disulfide	µg/kg	49 U	45 U	57 U	49 U	47 U	480 U
Carbon tetrachloride	µg/kg	49 U	45 U	57 U	49 U	47 U	480 U
Chlorobenzene	µg/kg	49 U	45 U	57 U	49 U	47 U	480 U
Chloroethane	µg/kg	49 U	45 U	57 U	49 U	47 U	480 U
Chloroform (Trichloromethane)	µg/kg	49 U	45 U	57 U	49 U	47 U	480 U
Chloromethane (Methyl chloride)	µg/kg	49 U	45 U	57 U	49 U	47 U	480 U
cis-1,2-Dichloroethene	µg/kg	20 J	45 U	57 U	49 U	47 U	200 J
cis-1,3-Dichloropropene	µg/kg	49 U	45 U	57 U	49 U	47 U	480 U
Cyclohexane	µg/kg	49 U	45 U	57 U	49 U	47 U	480 U
Dibromochloromethane	µg/kg	49 U	45 U	57 U	49 U	47 U	480 U
Dichlorodifluoromethane (CFC-12)	µg/kg	49 U	45 U	57 U	49 U	47 U	480 U
Ethylbenzene	µg/kg	49 U	45 U	57 U	49 U	47 U	480 U
Isopropyl benzene	µg/kg	49 U	45 U	57 U	49 U	47 U	480 U
Methyl acetate	µg/kg	240 U	230 U	290 U	250 U	230 U	2400 U
Methyl cyclohexane	µg/kg	49 U	45 U	57 U	49 U	47 U	480 U
Methyl tert butyl ether (MTBE)	µg/kg	49 U	45 U	57 U	49 U	47 U	480 U
Methylene chloride	µg/kg	49 U	45 U	57 U	49 U	47 U	480 U
Styrene	µg/kg	49 U	45 U	57 U	49 U	47 U	480 U
Tetrachloroethene	µg/kg	49 U	45 U	57 U	49 U	47 U	480 U
Toluene	µg/kg	49 U	45 U	57 U	49 U	47 U	480 U
trans-1,2-Dichloroethene	µg/kg	49 U	45 U	57 U	49 U	47 U	480 U
trans-1,3-Dichloropropene	µg/kg	49 U	45 U	57 U	49 U	47 U	480 U
Trichloroethene	µg/kg	920	690	230	210	190	23000
Trichlorofluoromethane (CFC-11)	µg/kg	49 U	45 U	57 U	49 U	47 U	480 U
Trifluorotrichloroethane (CFC-113)	µg/kg	49 U	45 U	57 U	49 U	47 U	480 U
Vinyl chloride	µg/kg	49 U	45 U	57 U	49 U	47 U	480 U
Xylenes (total)	µg/kg	98 U	90 U	110 U	99 U	94 U	960 U
General Chemistry							
Fraction organic carbon (FOC)	%	-	-	-	-	-	-
Notes:							
J - Estimated concentration							
U - Not detected at the associated reporting limit							
UJ - Not detected; associated reporting limit is estimated							
R - Rejected							
ft. bgs - Feet Below Ground Surface							
- = Not applicable							

Table 2B

Analytical Results Summary
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Location ID: Sample Name: Sample Date: Depth:		GP-24-1 S-11219347-111120-AMC-076 11/11/2020 15-16.1 ft. bgs	GP-30-1 S-11219347-111120-AMC-065 11/11/2020 4.5-6 ft. bgs	GP-30-1 S-11219347-111120-AMC-066 11/11/2020 6-8 ft. bgs	GP-30-1 S-11219347-111120-AMC-067 11/11/2020 8-10 ft. bgs	GP-30-1 S-11219347-111120-AMC-068 11/11/2020 10-12 ft. bgs	GP-30-1 S-11219347-111120-AMC-069 11/11/2020 12-14 ft. bgs
Parameters	Unit						
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/kg	5700 J	32 J	19 J	35 J	57	59
1,1,2,2-Tetrachloroethane	µg/kg	11000 U	50 U	48 U	46 U	51 U	49 U
1,1,2-Trichloroethane	µg/kg	11000 U	50 U	48 U	46 U	51 U	49 U
1,1-Dichloroethane	µg/kg	11000 U	20 J	48 U	46 U	51 U	49 U
1,1-Dichloroethene	µg/kg	6400 J	50 U	48 U	46 U	24 J	49 U
1,2,4-Trichlorobenzene	µg/kg	11000 U	50 U	48 U	46 U	51 U	49 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	11000 U	50 U	48 U	46 U	51 U	49 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	11000 U	50 U	48 U	46 U	51 U	49 U
1,2-Dichlorobenzene	µg/kg	11000 U	50 U	48 U	46 U	51 U	49 U
1,2-Dichloroethane	µg/kg	11000 U	50 U	48 U	46 U	51 U	49 U
1,2-Dichloropropane	µg/kg	11000 U	50 U	48 U	46 U	51 U	49 U
1,3-Dichlorobenzene	µg/kg	11000 U	50 U	48 U	46 U	51 U	49 U
1,4-Dichlorobenzene	µg/kg	11000 U	50 U	48 U	46 U	51 U	49 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	56000 U	250 U	240 U	230 U	260 U	250 U
2-Hexanone	µg/kg	56000 U	250 U	240 U	230 U	260 U	250 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	56000 U	250 U	240 U	230 U	260 U	250 U
Acetone	µg/kg	56000 U	250 U	240 U	230 U	260 U	250 U
Benzene	µg/kg	11000 U	50 U	48 U	46 U	51 U	49 U
Bromodichloromethane	µg/kg	11000 U	50 U	48 U	46 U	51 U	49 U
Bromoform	µg/kg	11000 U	50 U	48 U	46 U	51 U	49 U
Bromomethane (Methyl bromide)	µg/kg	11000 U	50 U	48 U	46 U	51 U	49 U
Carbon disulfide	µg/kg	11000 U	50 U	48 U	46 U	51 U	49 U
Carbon tetrachloride	µg/kg	11000 U	50 U	48 U	46 U	51 U	49 U
Chlorobenzene	µg/kg	11000 U	50 U	48 U	46 U	51 U	49 U
Chloroethane	µg/kg	11000 U	50 U	48 U	46 U	51 U	49 U
Chloroform (Trichloromethane)	µg/kg	11000 U	50 U	48 U	46 U	51 U	49 U
Chloromethane (Methyl chloride)	µg/kg	11000 U	50 U	48 U	46 U	51 U	49 U
cis-1,2-Dichloroethene	µg/kg	11000 U	110	130	60	51 U	49 U
cis-1,3-Dichloropropene	µg/kg	11000 U	50 U	48 U	46 U	51 U	49 U
Cyclohexane	µg/kg	11000 U	50 U	48 U	46 U	51 U	49 U
Dibromochloromethane	µg/kg	11000 U	50 U	48 U	46 U	51 U	49 U
Dichlorodifluoromethane (CFC-12)	µg/kg	11000 U	50 U	48 U	46 U	51 U	49 U
Ethylbenzene	µg/kg	11000 U	50 U	48 U	46 U	51 U	18 J
Isopropyl benzene	µg/kg	11000 U	50 U	48 U	46 U	51 U	7.5 J
Methyl acetate	µg/kg	56000 U	250 U	240 U	230 U	260 U	250 U
Methyl cyclohexane	µg/kg	11000 U	50 U	48 U	46 U	51 U	49 U
Methyl tert butyl ether (MTBE)	µg/kg	11000 U	50 U	48 U	46 U	51 U	49 U
Methylene chloride	µg/kg	11000 U	50 U	48 U	46 U	51 U	49 U
Styrene	µg/kg	11000 U	50 U	48 U	46 U	51 U	49 U
Tetrachloroethene	µg/kg	11000 U	50 U	48 U	46 U	51 U	49 U
Toluene	µg/kg	11000 U	50 U	48 U	46 U	51 U	49 U
trans-1,2-Dichloroethene	µg/kg	11000 U	50 U	48 U	46 U	51 U	49 U
trans-1,3-Dichloropropene	µg/kg	11000 U	50 U	48 U	46 U	51 U	49 U
Trichloroethene	µg/kg	330000	720	440	410	630	680
Trichlorofluoromethane (CFC-11)	µg/kg	11000 U	50 U	48 U	46 U	51 U	49 U
Trifluorotrichloroethane (CFC-113)	µg/kg	11000 U	50 U	48 U	46 U	51 U	49 U
Vinyl chloride	µg/kg	11000 U	50 U	48 U	46 U	51 U	49 U
Xylenes (total)	µg/kg	22000 U	99 U	95 U	91 U	100 U	150
General Chemistry							
Fraction organic carbon (FOC)	%	-	-	-	-	-	-

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit
UJ - Not detected; associated reporting limit is estimated
R - Rejected
ft. bgs - Feet Below Ground Surface
- = Not applicable

Table 2B

Analytical Results Summary
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Location ID:		GP-30-1	GP-31-1	GP-31-1	GP-31-1	GP-31-1	GP-31-1
Sample Name:		S-11219347-111120-AMC-070	S-11219347-111020-AMC-043	S-11219347-111020-AMC-044	S-11219347-111020-AMC-045	S-11219347-111020-AMC-046	S-11219347-111020-AMC-047
Sample Date:		11/11/2020	11/10/2020	11/10/2020	11/10/2020	11/10/2020	11/10/2020
Depth:		14-16.6 ft. bgs	6-8 ft. bgs	6-8 ft. bgs	8-10 ft. bgs	10-12 ft. bgs	12-14 ft. bgs
Parameters	Unit			Duplicate			
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/kg	44 U	0.55 J	0.66 J	0.049 U	0.050 U	0.050 U
1,1,2,2-Tetrachloroethane	µg/kg	44 U	4.1 U	2.3 U	0.049 U	0.050 U	0.050 U
1,1,2-Trichloroethane	µg/kg	44 U	4.1 U	2.3 U	0.049 U	0.050 U	0.050 U
1,1-Dichloroethane	µg/kg	44 U	6.7	8.5	0.049 U	0.050 U	0.050 U
1,1-Dichloroethene	µg/kg	44 U	1.5 J	2.3	0.049 U	0.050 U	0.050 U
1,2,4-Trichlorobenzene	µg/kg	44 U	4.1 U	2.3 U	0.049 U	0.050 U	0.050 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	44 U	4.1 U	2.3 U	0.049 U	0.050 U	0.050 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	44 U	4.1 U	2.3 U	0.049 U	0.050 U	0.050 U
1,2-Dichlorobenzene	µg/kg	44 U	4.1 U	2.3 U	0.049 U	0.050 U	0.050 U
1,2-Dichloroethane	µg/kg	44 U	4.1 U	2.3 U	0.049 U	0.050 U	0.050 U
1,2-Dichloropropane	µg/kg	44 U	4.1 U	2.3 U	0.049 U	0.050 U	0.050 U
1,3-Dichlorobenzene	µg/kg	44 U	4.1 U	2.3 U	0.049 U	0.050 U	0.050 U
1,4-Dichlorobenzene	µg/kg	44 U	4.1 U	2.3 U	0.049 U	0.050 U	0.050 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	220 U	21 U	12 U	0.25 U	0.25 U	0.25 U
2-Hexanone	µg/kg	220 U	21 U	12 U	0.25 U	0.25 U	0.25 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	220 U	21 U	12 U	0.25 U	0.25 U	0.25 U
Acetone	µg/kg	220 U	21 U	12 U	0.25 U	0.25 U	0.25 U
Benzene	µg/kg	44 U	4.1 U	2.3 U	0.049 U	0.050 U	0.050 U
Bromodichloromethane	µg/kg	44 U	4.1 U	2.3 U	0.049 U	0.050 U	0.050 U
Bromoform	µg/kg	44 U	4.1 U	2.3 U	0.049 U	0.050 U	0.050 U
Bromomethane (Methyl bromide)	µg/kg	44 U	4.1 U	2.3 U	0.049 U	0.050 U	0.050 U
Carbon disulfide	µg/kg	44 U	4.1 U	2.3 U	0.049 U	0.050 U	0.050 U
Carbon tetrachloride	µg/kg	44 U	4.1 U	2.3 U	0.049 U	0.050 U	0.050 U
Chlorobenzene	µg/kg	44 U	4.1 U	2.3 U	0.049 U	0.050 U	0.050 U
Chloroethane	µg/kg	44 U	4.1 U	2.3 U	0.049 U	0.050 U	0.050 U
Chloroform (Trichloromethane)	µg/kg	44 U	4.1 U	2.3 U	0.049 U	0.050 U	0.050 U
Chloromethane (Methyl chloride)	µg/kg	44 U	4.1 U	2.3 U	0.049 U	0.050 U	0.050 U
cis-1,2-Dichloroethene	µg/kg	44 U	18	22	0.049 U	0.050 U	0.050 U
cis-1,3-Dichloropropene	µg/kg	44 U	4.1 U	2.3 U	0.049 U	0.050 U	0.050 U
Cyclohexane	µg/kg	44 U	4.1 U	2.3 U	0.049 U	0.050 U	0.050 U
Dibromochloromethane	µg/kg	44 U	4.1 U	2.3 U	0.049 U	0.050 U	0.050 U
Dichlorodifluoromethane (CFC-12)	µg/kg	44 U	4.1 U	2.3 U	0.049 U	0.050 U	0.050 U
Ethylbenzene	µg/kg	44 U	4.1 U	2.3 U	0.049 U	0.050 U	0.050 U
Isopropyl benzene	µg/kg	44 U	4.1 U	2.3 U	0.049 U	0.050 U	0.050 U
Methyl acetate	µg/kg	220 U	21 U	12 U	0.25 U	0.25 U	0.25 U
Methyl cyclohexane	µg/kg	44 U	4.1 U	2.3 U	0.049 U	0.050 U	0.050 U
Methyl tert butyl ether (MTBE)	µg/kg	44 U	4.1 U	2.3 U	0.049 U	0.050 U	0.050 U
Methylene chloride	µg/kg	44 U	4.1 U	2.3 U	0.049 U	0.050 U	0.050 U
Styrene	µg/kg	44 U	4.1 U	2.3 U	0.049 U	0.050 U	0.050 U
Tetrachloroethene	µg/kg	44 U	4.1 U	2.3 U	0.049 U	0.050 U	0.050 U
Toluene	µg/kg	44 U	4.1 U	2.3 U	0.049 U	0.050 U	0.050 U
trans-1,2-Dichloroethene	µg/kg	44 U	4.1 U	0.24 J	0.049 U	0.050 U	0.050 U
trans-1,3-Dichloropropene	µg/kg	44 U	4.1 U	2.3 U	0.049 U	0.050 U	0.050 U
Trichloroethene	µg/kg	540	20	23	0.18	0.20	0.35
Trichlorofluoromethane (CFC-11)	µg/kg	44 U	4.1 U	2.3 U	0.049 U	0.050 U	0.050 U
Trifluorotrichloroethane (CFC-113)	µg/kg	44 U	4.1 U	2.3 U	0.049 U	0.050 U	0.050 U
Vinyl chloride	µg/kg	44 U	13	16	0.049 U	0.050 U	0.050 U
Xylenes (total)	µg/kg	87 U	8.3 U	4.6 U	0.099 U	0.10 U	0.099 U
General Chemistry							
Fraction organic carbon (FOC)	%	-	-	-	-	-	-

Notes:

- J - Estimated concentration
- U - Not detected at the associated reporting limit
- UJ - Not detected; associated reporting limit is estimated
- R - Rejected
- ft. bgs - Feet Below Ground Surface
- = Not applicable

Table 2B

Analytical Results Summary
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Location ID: Sample Name: Sample Date: Depth:		GP-31-1 S-11219347-111020-AMC-048 11/10/2020 14-16.3 ft. bgs	GP-33-1 S-11219347-111120-AMC-051 11/11/2020 3-5 ft. bgs	GP-33-1 S-11219347-111120-AMC-052 11/11/2020 5-7 ft. bgs	GP-33-1 S-11219347-111120-AMC-053 11/11/2020 7-9 ft. bgs	GP-33-1 S-11219347-111120-AMC-054 11/11/2020 9-11 ft. bgs	GP-33-1 S-11219347-111120-AMC-055 11/11/2020 11-13 ft. bgs
Parameters	Unit						
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/kg	0.057 U	-	130 U	39 J	100	54
1,1,2,2-Tetrachloroethane	µg/kg	0.057 U	-	130 U	43 U	52 U	46 U
1,1,2-Trichloroethane	µg/kg	0.057 U	-	130 U	43 U	52 U	46 U
1,1-Dichloroethane	µg/kg	0.057 U	-	100 J	41 J	42 J	35 J
1,1-Dichloroethene	µg/kg	0.057 U	-	330	95	34 J	69
1,2,4-Trichlorobenzene	µg/kg	0.057 U	-	130 U	43 U	52 U	46 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	0.057 U	-	130 U	43 U	52 U	46 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	0.057 U	-	130 U	43 U	52 U	46 U
1,2-Dichlorobenzene	µg/kg	0.057 U	-	130 U	43 U	52 U	46 U
1,2-Dichloroethane	µg/kg	0.057 U	-	130 U	43 U	52 U	46 U
1,2-Dichloropropane	µg/kg	0.057 U	-	130 U	43 U	52 U	46 U
1,3-Dichlorobenzene	µg/kg	0.057 U	-	130 U	43 U	52 U	46 U
1,4-Dichlorobenzene	µg/kg	0.057 U	-	130 U	43 U	52 U	46 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	0.28 U	-	630 U	220 U	260 U	230 U
2-Hexanone	µg/kg	0.28 U	-	630 U	220 U	260 U	230 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	0.28 U	-	630 U	220 U	260 U	230 U
Acetone	µg/kg	0.28 U	-	630 U	220 U	260 U	230 U
Benzene	µg/kg	0.057 U	-	130 U	43 U	52 U	46 U
Bromodichloromethane	µg/kg	0.057 U	-	130 U	43 U	52 U	46 U
Bromoform	µg/kg	0.057 U	-	130 U	43 U	52 U	46 U
Bromomethane (Methyl bromide)	µg/kg	0.057 U	-	130 U	43 U	52 U	46 U
Carbon disulfide	µg/kg	0.057 U	-	130 U	43 U	52 U	46 U
Carbon tetrachloride	µg/kg	0.057 U	-	130 U	43 U	52 U	46 U
Chlorobenzene	µg/kg	0.057 U	-	130 U	43 U	52 U	46 U
Chloroethane	µg/kg	0.057 U	-	130 U	43 U	52 U	46 U
Chloroform (Trichloromethane)	µg/kg	0.057 U	-	130 U	43 U	52 U	46 U
Chloromethane (Methyl chloride)	µg/kg	0.057 U	-	130 U	43 U	52 U	46 U
cis-1,2-Dichloroethene	µg/kg	0.057 U	-	980	320	140	120
cis-1,3-Dichloropropene	µg/kg	0.057 U	-	130 U	43 U	52 U	46 U
Cyclohexane	µg/kg	0.057 U	-	130 U	43 U	52 U	46 U
Dibromochloromethane	µg/kg	0.057 U	-	130 U	43 U	52 U	46 U
Dichlorodifluoromethane (CFC-12)	µg/kg	0.057 U	-	130 U	43 U	52 U	46 U
Ethylbenzene	µg/kg	0.057 U	-	130 U	43 U	52 U	46 U
Isopropyl benzene	µg/kg	0.057 U	-	130 U	43 U	52 U	46 U
Methyl acetate	µg/kg	0.28 U	-	630 U	220 U	260 U	230 U
Methyl cyclohexane	µg/kg	0.057 U	-	130 U	43 U	52 U	46 U
Methyl tert butyl ether (MTBE)	µg/kg	0.057 U	-	130 U	43 U	52 U	46 U
Methylene chloride	µg/kg	0.057 U	-	130 U	43 U	52 U	46 U
Styrene	µg/kg	0.057 U	-	130 U	43 U	52 U	46 U
Tetrachloroethene	µg/kg	0.057 U	-	130 U	43 U	52 U	46 U
Toluene	µg/kg	0.057 U	-	130 U	43 U	52 U	46 U
trans-1,2-Dichloroethene	µg/kg	0.057 U	-	110 J	28 J	52 U	46 U
trans-1,3-Dichloropropene	µg/kg	0.057 U	-	130 U	43 U	52 U	46 U
Trichloroethene	µg/kg	0.39	-	3600	1600	1500	1400
Trichlorofluoromethane (CFC-11)	µg/kg	0.057 U	-	130 U	43 U	52 U	46 U
Trifluorotrichloroethane (CFC-113)	µg/kg	0.057 U	-	130 U	43 U	52 U	46 U
Vinyl chloride	µg/kg	0.057 U	-	130 U	43 U	52 U	46 U
Xylenes (total)	µg/kg	0.11 U	-	250 U	87 U	100 U	92 U
General Chemistry							
Fraction organic carbon (FOC)	%	-	0.7	-	-	-	-

Notes:
J - Estimated concentration
U - Not detected at the associated reporting limit
UJ - Not detected; associated reporting limit is estimated
R - Rejected
ft. bgs - Feet Below Ground Surface
- = Not applicable

Table 2B

Analytical Results Summary
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Location ID: Sample Name: Sample Date: Depth:		GP-33-1 S-11219347-111120-AMC-056 11/11/2020 13-15 ft. bgs	GP-33-1 S-11219347-111120-AMC-057 11/11/2020 15-16.3 ft. bgs	GP-35-1 S-11219347-111120-AMC-058 11/11/2020 4.5-6 ft. bgs	GP-35-1 S-11219347-111120-AMC-059 11/11/2020 6-8 ft. bgs	GP-35-1 S-11219347-111120-AMC-060 11/11/2020 6-8 ft. bgs Duplicate	GP-35-1 S-11219347-111120-AMC-061 11/11/2020 8-10 ft. bgs
Parameters	Unit						
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/kg	37 J	43 J	56 U	33 J	44 J	41 J
1,1,2,2-Tetrachloroethane	µg/kg	49 U	47 U	56 U	47 U	58 U	54 U
1,1,2-Trichloroethane	µg/kg	49 U	47 U	56 U	47 U	58 U	54 U
1,1-Dichloroethane	µg/kg	26 J	25 J	35 J	32 J	31 J	54 U
1,1-Dichloroethene	µg/kg	72	47 U	56 U	47 U	58 U	54 U
1,2,4-Trichlorobenzene	µg/kg	49 U	47 U	56 U	47 U	58 U	54 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	49 U	47 U	56 U	47 U	58 U	54 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	49 U	47 U	56 U	47 U	58 U	54 U
1,2-Dichlorobenzene	µg/kg	49 U	47 U	56 U	47 U	58 U	54 U
1,2-Dichloroethane	µg/kg	49 U	47 U	56 U	47 U	58 U	54 U
1,2-Dichloropropane	µg/kg	49 U	47 U	56 U	47 U	58 U	54 U
1,3-Dichlorobenzene	µg/kg	49 U	47 U	56 U	47 U	58 U	54 U
1,4-Dichlorobenzene	µg/kg	49 U	47 U	56 U	47 U	58 U	54 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	250 U	240 U	280 U	230 U	290 U	270 U
2-Hexanone	µg/kg	250 U	240 U	280 U	230 U	290 U	270 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	250 U	240 U	280 U	230 U	290 U	270 U
Acetone	µg/kg	250 U	240 U	280 U	230 U	290 U	270 U
Benzene	µg/kg	49 U	47 U	56 U	47 U	58 U	54 U
Bromodichloromethane	µg/kg	49 U	47 U	56 U	47 U	58 U	54 U
Bromoform	µg/kg	49 U	47 U	56 U	47 U	58 U	54 U
Bromomethane (Methyl bromide)	µg/kg	49 U	47 U	56 U	47 U	58 U	54 U
Carbon disulfide	µg/kg	49 U	47 U	56 U	47 U	58 U	54 U
Carbon tetrachloride	µg/kg	49 U	47 U	56 U	47 U	58 U	54 U
Chlorobenzene	µg/kg	49 U	47 U	56 U	47 U	58 U	54 U
Chloroethane	µg/kg	49 U	47 U	56 U	47 U	58 U	54 U
Chloroform (Trichloromethane)	µg/kg	49 U	47 U	56 U	47 U	58 U	54 U
Chloromethane (Methyl chloride)	µg/kg	49 U	47 U	56 U	47 U	58 U	54 U
cis-1,2-Dichloroethene	µg/kg	76	67	250	180	230	20 J
cis-1,3-Dichloropropene	µg/kg	49 U	47 U	56 U	47 U	58 U	54 U
Cyclohexane	µg/kg	49 U	47 U	56 U	47 U	58 U	54 U
Dibromochloromethane	µg/kg	49 U	47 U	56 U	47 U	58 U	54 U
Dichlorodifluoromethane (CFC-12)	µg/kg	49 U	47 U	56 U	47 U	58 U	54 U
Ethylbenzene	µg/kg	49 U	47 U	56 U	47 U	58 U	54 U
Isopropyl benzene	µg/kg	49 U	47 U	56 U	47 U	58 U	54 U
Methyl acetate	µg/kg	250 U	240 U	280 U	230 U	290 U	270 U
Methyl cyclohexane	µg/kg	49 U	47 U	56 U	47 U	58 U	54 U
Methyl tert butyl ether (MTBE)	µg/kg	49 U	47 U	56 U	47 U	58 U	54 U
Methylene chloride	µg/kg	49 U	47 U	56 U	47 U	58 U	54 U
Styrene	µg/kg	49 U	47 U	56 U	47 U	58 U	54 U
Tetrachloroethene	µg/kg	49 U	47 U	56 U	47 U	58 U	54 U
Toluene	µg/kg	49 U	47 U	56 U	47 U	58 U	54 U
trans-1,2-Dichloroethene	µg/kg	49 U	47 U	56 U	47 U	58 U	54 U
trans-1,3-Dichloropropene	µg/kg	49 U	47 U	56 U	47 U	58 U	54 U
Trichloroethene	µg/kg	830	820	910	850	900	740
Trichlorofluoromethane (CFC-11)	µg/kg	49 U	47 U	56 U	47 U	58 U	54 U
Trifluorotrichloroethane (CFC-113)	µg/kg	49 U	47 U	56 U	47 U	58 U	54 U
Vinyl chloride	µg/kg	49 U	47 U	56 U	47 U	58 U	54 U
Xylenes (total)	µg/kg	99 U	94 U	110 U	93 U	120 U	110 U
General Chemistry							
Fraction organic carbon (FOC)	%	-	-	-	-	-	-

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit
UJ - Not detected; associated reporting limit is estimated
R - Rejected
ft. bgs - Feet Below Ground Surface
- = Not applicable

Table 2B

Analytical Results Summary
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Location ID: Sample Name: Sample Date: Depth:		GP-35-1 S-11219347-111120-AMC-062 11/11/2020 10-12 ft. bgs	GP-35-1 S-11219347-111120-AMC-063 11/11/2020 12-14 ft. bgs	GP-35-1 S-11219347-111120-AMC-064 11/11/2020 14-15.9 ft. bgs	GP-36 S-11219347-111720-AMC-162 11/17/2020 6-8 ft. bgs	GP-36 S-11219347-111720-AMC-163 11/17/2020 8-10 ft. bgs	GP-36 S-11219347-111720-AMC-164 11/17/2020 10-12 ft. bgs
Parameters	Unit						
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/kg	47 U	48 U	49 U	7.0	5.5	5.8
1,1,2,2-Tetrachloroethane	µg/kg	47 U	48 U	49 U	4.7 U	4.2 U	3.6 U
1,1,2-Trichloroethane	µg/kg	47 U	48 U	49 U	4.7 U	4.2 U	3.6 U
1,1-Dichloroethane	µg/kg	47 U	48 U	49 U	2.0 J	1.9 J	1.9 J
1,1-Dichloroethene	µg/kg	47 U	48 U	49 U	0.85 J	0.76 J	0.84 J
1,2,4-Trichlorobenzene	µg/kg	47 U	48 U	49 U	4.7 U	4.2 U	3.6 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	47 U	48 U	49 U	4.7 U	4.2 U	3.6 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	47 U	48 U	49 U	4.7 U	4.2 U	3.6 U
1,2-Dichlorobenzene	µg/kg	47 U	48 U	49 U	4.7 U	4.2 U	3.6 U
1,2-Dichloroethane	µg/kg	47 U	48 U	49 U	4.7 U	4.2 U	3.6 U
1,2-Dichloropropane	µg/kg	47 U	48 U	49 U	4.7 U	4.2 U	3.6 U
1,3-Dichlorobenzene	µg/kg	47 U	48 U	49 U	4.7 U	4.2 U	3.6 U
1,4-Dichlorobenzene	µg/kg	47 U	48 U	49 U	4.7 U	4.2 U	3.6 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	230 U	240 U	250 U	23 U	21 U	18 U
2-Hexanone	µg/kg	230 U	240 U	250 U	23 U	21 U	18 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	230 U	240 U	250 U	23 U	21 U	18 U
Acetone	µg/kg	230 U	240 U	250 U	23 U	21 U	18 U
Benzene	µg/kg	47 U	48 U	49 U	4.7 U	4.2 U	3.6 U
Bromodichloromethane	µg/kg	47 U	48 U	49 U	4.7 U	4.2 U	3.6 U
Bromoform	µg/kg	47 U	48 U	49 U	4.7 U	4.2 U	3.6 U
Bromomethane (Methyl bromide)	µg/kg	47 U	48 U	49 U	4.7 U	4.2 U	3.6 U
Carbon disulfide	µg/kg	47 U	48 U	49 U	4.7 U	4.2 U	3.6 U
Carbon tetrachloride	µg/kg	47 U	48 U	49 U	4.7 U	4.2 U	3.6 U
Chlorobenzene	µg/kg	47 U	48 U	49 U	4.7 U	4.2 U	3.6 U
Chloroethane	µg/kg	47 U	48 U	49 U	4.7 U	4.2 U	3.6 U
Chloroform (Trichloromethane)	µg/kg	47 U	48 U	49 U	4.7 U	4.2 U	3.6 U
Chloromethane (Methyl chloride)	µg/kg	47 U	48 U	49 U	4.7 U	4.2 U	3.6 U
cis-1,2-Dichloroethene	µg/kg	47 U	48 U	49 U	3.2 J	3.4 J	2.8 J
cis-1,3-Dichloropropene	µg/kg	47 U	48 U	49 U	4.7 U	4.2 U	3.6 U
Cyclohexane	µg/kg	47 U	48 U	49 U	4.7 U	4.2 U	3.6 U
Dibromochloromethane	µg/kg	47 U	48 U	49 U	4.7 U	4.2 U	3.6 U
Dichlorodifluoromethane (CFC-12)	µg/kg	47 U	48 U	49 U	4.7 U	4.2 U	3.6 U
Ethylbenzene	µg/kg	47 U	48 U	49 U	4.7 U	4.2 U	3.6 U
Isopropyl benzene	µg/kg	47 U	48 U	49 U	4.7 U	4.2 U	3.6 U
Methyl acetate	µg/kg	230 U	240 U	250 U	23 U	21 U	18 U
Methyl cyclohexane	µg/kg	47 U	48 U	49 U	4.7 U	4.2 U	3.6 U
Methyl tert butyl ether (MTBE)	µg/kg	47 U	48 U	49 U	4.7 U	4.2 U	3.6 U
Methylene chloride	µg/kg	47 U	48 U	49 U	4.7 U	4.2 U	3.6 U
Styrene	µg/kg	47 U	48 U	49 U	4.7 U	4.2 U	3.6 U
Tetrachloroethene	µg/kg	47 U	48 U	49 U	4.7 U	4.2 U	3.6 U
Toluene	µg/kg	47 U	48 U	49 U	4.7 U	4.2 U	3.6 U
trans-1,2-Dichloroethene	µg/kg	47 U	48 U	49 U	4.7 U	4.2 U	3.6 U
trans-1,3-Dichloropropene	µg/kg	47 U	48 U	49 U	4.7 U	4.2 U	3.6 U
Trichloroethene	µg/kg	400	160	130	17	22	22
Trichlorofluoromethane (CFC-11)	µg/kg	47 U	48 U	49 U	4.7 U	4.2 U	3.6 U
Trifluorotrichloroethane (CFC-113)	µg/kg	47 U	48 U	49 U	4.7 U	4.2 U	3.6 U
Vinyl chloride	µg/kg	47 U	48 U	49 U	4.7 U	4.2 U	3.6 U
Xylenes (total)	µg/kg	94 U	96 U	98 U	9.4 U	8.4 U	7.2 U
General Chemistry							
Fraction organic carbon (FOC)	%	-	-	-	-	-	-

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit
UJ - Not detected; associated reporting limit is estimated
R - Rejected
ft. bgs - Feet Below Ground Surface
- = Not applicable

Table 2B

Analytical Results Summary
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Location ID:		GP-36	GP-36	GP-37	GP-37	GP-37	GP-37
Sample Name:		S-11219347-111720-AMC-165	S-11219347-111720-AMC-166	S-11219347-111720-AMC-156	S-11219347-111720-AMC-157	S-11219347-111720-AMC-158	S-11219347-111720-AMC-159
Sample Date:		11/17/2020	11/17/2020	11/17/2020	11/17/2020	11/17/2020	11/17/2020
Depth:		12-14 ft. bgs	14-15.7 ft. bgs	4-5 ft. bgs	6-8 ft. bgs	8-10 ft. bgs	10-12 ft. bgs
Parameters	Unit						
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/kg	7.7	3.8 J	-	59 U	51 U	59 U
1,1,2,2-Tetrachloroethane	µg/kg	3.8 U	4.3 U	-	59 U	51 U	59 U
1,1,2-Trichloroethane	µg/kg	3.8 U	4.3 U	-	59 U	51 U	59 U
1,1-Dichloroethane	µg/kg	1.4 J	0.75 J	-	30 J	51 U	59 U
1,1-Dichloroethene	µg/kg	2.3 J	1.7 J	-	59 U	51 U	59 U
1,2,4-Trichlorobenzene	µg/kg	3.8 U	4.3 U	-	59 U	51 U	59 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	3.8 U	4.3 U	-	59 U	51 U	59 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	3.8 U	4.3 U	-	59 U	51 U	59 U
1,2-Dichlorobenzene	µg/kg	3.8 U	4.3 U	-	59 U	51 U	59 U
1,2-Dichloroethane	µg/kg	3.8 U	4.3 U	-	59 U	51 U	59 U
1,2-Dichloropropane	µg/kg	3.8 U	4.3 U	-	59 U	51 U	59 U
1,3-Dichlorobenzene	µg/kg	3.8 U	4.3 U	-	59 U	51 U	59 U
1,4-Dichlorobenzene	µg/kg	3.8 U	4.3 U	-	59 U	51 U	59 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	19 U	22 U	-	290 U	260 U	300 U
2-Hexanone	µg/kg	19 U	22 U	-	290 U	260 U	300 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	19 U	22 U	-	290 U	260 U	300 U
Acetone	µg/kg	19 U	22 U	-	290 U	260 U	300 U
Benzene	µg/kg	3.8 U	4.3 U	-	59 U	51 U	59 U
Bromodichloromethane	µg/kg	3.8 U	4.3 U	-	59 U	51 U	59 U
Bromoform	µg/kg	3.8 U	4.3 U	-	59 U	51 U	59 U
Bromomethane (Methyl bromide)	µg/kg	3.8 U	4.3 U	-	59 U	51 U	59 U
Carbon disulfide	µg/kg	3.8 U	4.3 U	-	59 U	51 U	59 U
Carbon tetrachloride	µg/kg	3.8 U	4.3 U	-	59 U	51 U	59 U
Chlorobenzene	µg/kg	3.8 U	4.3 U	-	59 U	51 U	59 U
Chloroethane	µg/kg	3.8 U	4.3 U	-	59 U	51 U	59 U
Chloroform (Trichloromethane)	µg/kg	3.8 U	4.3 U	-	59 U	51 U	59 U
Chloromethane (Methyl chloride)	µg/kg	3.8 U	4.3 U	-	59 U	51 U	59 U
cis-1,2-Dichloroethene	µg/kg	1.6 J	0.68 J	-	63	23 J	23 J
cis-1,3-Dichloropropene	µg/kg	3.8 U	4.3 U	-	59 U	51 U	59 U
Cyclohexane	µg/kg	3.8 U	4.3 U	-	59 U	51 U	59 U
Dibromochloromethane	µg/kg	3.8 U	4.3 U	-	59 U	51 U	59 U
Dichlorodifluoromethane (CFC-12)	µg/kg	3.8 U	4.3 U	-	59 U	51 U	59 U
Ethylbenzene	µg/kg	3.8 U	4.3 U	-	59 U	51 U	59 U
Isopropyl benzene	µg/kg	3.8 U	4.3 U	-	59 U	51 U	59 U
Methyl acetate	µg/kg	19 U	22 U	-	290 U	260 U	300 U
Methyl cyclohexane	µg/kg	3.8 U	4.3 U	-	59 U	51 U	59 U
Methyl tert butyl ether (MTBE)	µg/kg	3.8 U	4.3 U	-	59 U	51 U	59 U
Methylene chloride	µg/kg	3.8 U	4.3 U	-	59 U	51 U	59 U
Styrene	µg/kg	3.8 U	4.3 U	-	59 U	51 U	59 U
Tetrachloroethene	µg/kg	3.8 U	4.3 U	-	59 U	51 U	59 U
Toluene	µg/kg	3.8 U	4.3 U	-	59 U	51 U	59 U
trans-1,2-Dichloroethene	µg/kg	3.8 U	4.3 U	-	59 U	51 U	59 U
trans-1,3-Dichloropropene	µg/kg	3.8 U	4.3 U	-	59 U	51 U	59 U
Trichloroethene	µg/kg	43	38	-	1400	230	270
Trichlorofluoromethane (CFC-11)	µg/kg	3.8 U	4.3 U	-	59 U	51 U	59 U
Trifluorotrichloroethane (CFC-113)	µg/kg	3.8 U	4.3 U	-	59 U	51 U	59 U
Vinyl chloride	µg/kg	3.8 U	4.3 U	-	59 U	51 U	59 U
Xylenes (total)	µg/kg	7.5 U	8.7 U	-	120 U	100 U	120 U
General Chemistry							
Fraction organic carbon (FOC)	%	-	-	4.0	-	-	-

Notes:

- J - Estimated concentration
- U - Not detected at the associated reporting limit
- UJ - Not detected; associated reporting limit is estimated
- R - Rejected
- ft. bgs - Feet Below Ground Surface
- = Not applicable

Table 2B

Analytical Results Summary
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Location ID:		GP-37	GP-37	GP-38	GP-38	GP-38	GP-38
Sample Name:		S-11219347-111720-AMC-160	S-11219347-111720-AMC-161	S-11219347-111320-AMC-102	S-11219347-111320-AMC-103	S-11219347-111320-AMC-104	S-11219347-111320-AMC-105
Sample Date:		11/17/2020	11/17/2020	11/13/2020	11/13/2020	11/13/2020	11/13/2020
Depth:		12-14 ft. bgs	14-15.1 ft. bgs	8.5-10 ft. bgs	10-12 ft. bgs	10-12 ft. bgs Duplicate	12-14 ft. bgs
Parameters	Unit						
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/kg	3.8	2.4 J	57 U	57 U	55 U	53 J
1,1,2,2-Tetrachloroethane	µg/kg	3.7 U	3.7 U	57 U	57 U	55 U	59 U
1,1,2-Trichloroethane	µg/kg	3.7 U	3.7 U	57 U	57 U	55 U	59 U
1,1-Dichloroethane	µg/kg	2.5 J	2.0 J	57 U	57 U	55 U	59 U
1,1-Dichloroethene	µg/kg	1.4 J	1.3 J	57 U	57 U	55 U	59 U
1,2,4-Trichlorobenzene	µg/kg	3.7 U	3.7 U	57 U	57 U	55 U	59 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	3.7 U	3.7 U	57 U	57 U	55 U	59 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	3.7 U	3.7 U	57 U	57 U	55 U	59 U
1,2-Dichlorobenzene	µg/kg	3.7 U	3.7 U	57 U	57 U	55 U	59 U
1,2-Dichloroethane	µg/kg	3.7 U	3.7 U	57 U	57 U	55 U	59 U
1,2-Dichloropropane	µg/kg	3.7 U	3.7 U	57 U	57 U	55 U	59 U
1,3-Dichlorobenzene	µg/kg	3.7 U	3.7 U	57 U	57 U	55 U	59 U
1,4-Dichlorobenzene	µg/kg	3.7 U	3.7 U	57 U	57 U	55 U	59 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	18 U	19 U	280 U	290 U	280 U	290 U
2-Hexanone	µg/kg	18 U	19 U	280 U	290 U	280 U	290 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	18 U	19 U	280 U	290 U	280 U	290 U
Acetone	µg/kg	18 U	19 U	280 U	290 U	280 U	290 U
Benzene	µg/kg	3.7 U	3.7 U	57 U	57 U	55 U	59 U
Bromodichloromethane	µg/kg	3.7 U	3.7 U	57 U	57 U	55 U	59 U
Bromoform	µg/kg	3.7 U	3.7 U	57 U	57 U	55 U	59 U
Bromomethane (Methyl bromide)	µg/kg	3.7 U	3.7 U	57 U	57 U	55 U	59 U
Carbon disulfide	µg/kg	3.7 U	3.7 U	57 U	57 U	55 U	59 U
Carbon tetrachloride	µg/kg	3.7 U	3.7 U	57 U	57 U	55 U	59 U
Chlorobenzene	µg/kg	3.7 U	3.7 U	57 U	57 U	55 U	59 U
Chloroethane	µg/kg	3.7 U	3.7 U	57 U	57 U	55 U	59 U
Chloroform (Trichloromethane)	µg/kg	3.7 U	3.7 U	57 U	57 U	55 U	59 U
Chloromethane (Methyl chloride)	µg/kg	3.7 U	3.7 U	57 U	57 U	55 U	59 U
cis-1,2-Dichloroethene	µg/kg	2.4 J	1.2 J	57 U	57 U	55 U	59 U
cis-1,3-Dichloropropene	µg/kg	3.7 U	3.7 U	57 U	57 U	55 U	59 U
Cyclohexane	µg/kg	3.7 U	3.7 U	57 U	57 U	55 U	59 U
Dibromochloromethane	µg/kg	3.7 U	3.7 U	57 U	57 U	55 U	59 U
Dichlorodifluoromethane (CFC-12)	µg/kg	3.7 U	3.7 U	57 U	57 U	55 U	59 U
Ethylbenzene	µg/kg	3.7 U	3.7 U	57 U	57 U	55 U	59 U
Isopropyl benzene	µg/kg	3.7 U	3.7 U	57 U	57 U	55 U	59 U
Methyl acetate	µg/kg	18 U	19 U	280 U	290 U	280 U	290 U
Methyl cyclohexane	µg/kg	3.7 U	3.7 U	57 U	57 U	55 U	59 U
Methyl tert butyl ether (MTBE)	µg/kg	3.7 U	3.7 U	57 U	57 U	55 U	59 U
Methylene chloride	µg/kg	3.7 U	3.7 U	57 U	57 U	55 U	59 U
Styrene	µg/kg	3.7 U	3.7 U	57 U	57 U	55 U	59 U
Tetrachloroethene	µg/kg	3.7 U	3.7 U	57 U	57 U	55 U	59 U
Toluene	µg/kg	3.7 U	3.7 U	57 U	57 U	55 U	59 U
trans-1,2-Dichloroethene	µg/kg	3.7 U	3.7 U	57 U	57 U	55 U	59 U
trans-1,3-Dichloropropene	µg/kg	3.7 U	3.7 U	57 U	57 U	55 U	59 U
Trichloroethene	µg/kg	17	18	620	590	660	650
Trichlorofluoromethane (CFC-11)	µg/kg	3.7 U	3.7 U	57 U	57 U	55 U	59 U
Trifluorotrichloroethane (CFC-113)	µg/kg	3.7 U	3.7 U	57 U	57 U	55 U	59 U
Vinyl chloride	µg/kg	3.7 U	3.7 U	57 U	57 U	55 U	59 U
Xylenes (total)	µg/kg	7.4 U	7.5 U	110 U	110 U	110 U	120 U
General Chemistry							
Fraction organic carbon (FOC)	%	-	-	-	-	-	-

Notes:

- J - Estimated concentration
- U - Not detected at the associated reporting limit
- UJ - Not detected; associated reporting limit is estimated
- R - Rejected
- ft. bgs - Feet Below Ground Surface
- = Not applicable

Table 2B

Analytical Results Summary
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Location ID:		GP-38	GP-39	GP-39	GP-39	GP-39	GP-40
Sample Name:		S-11219347-111320-AMC-106	S-11219347-111320-AMC-107	S-11219347-111320-AMC-108	S-11219347-111320-AMC-109	S-11219347-111320-AMC-110	S-11219347-111020-AMC-034
Sample Date:		11/13/2020	11/13/2020	11/13/2020	11/13/2020	11/13/2020	11/10/2020
Depth:		14-16.2 ft. bgs	9-11 ft. bgs	11-13 ft. bgs	13-15 ft. bgs	15-15.9 ft. bgs	5-7 ft. bgs
Parameters	Unit						
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/kg	63 U	7.9	52 U	8.5	29 J	0.050 U
1,1,2,2-Tetrachloroethane	µg/kg	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U
1,1,2-Trichloroethane	µg/kg	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U
1,1-Dichloroethane	µg/kg	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U
1,1-Dichloroethene	µg/kg	63 U	0.67 J	52 U	1.4 J	48 U	0.050 U
1,2,4-Trichlorobenzene	µg/kg	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U
1,2-Dichlorobenzene	µg/kg	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U
1,2-Dichloroethane	µg/kg	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U
1,2-Dichloropropane	µg/kg	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U
1,3-Dichlorobenzene	µg/kg	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U
1,4-Dichlorobenzene	µg/kg	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	320 U	23 U	260 U	18 U	240 U	0.25 U
2-Hexanone	µg/kg	320 U	23 U	260 U	18 U	240 U	0.25 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	320 U	23 U	260 U	18 U	240 U	0.25 U
Acetone	µg/kg	320 U	23 U	260 U	18 U	240 U	0.25 U
Benzene	µg/kg	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U
Bromodichloromethane	µg/kg	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U
Bromoform	µg/kg	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U
Bromomethane (Methyl bromide)	µg/kg	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U
Carbon disulfide	µg/kg	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U
Carbon tetrachloride	µg/kg	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U
Chlorobenzene	µg/kg	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U
Chloroethane	µg/kg	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U
Chloroform (Trichloromethane)	µg/kg	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U
Chloromethane (Methyl chloride)	µg/kg	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U
cis-1,2-Dichloroethene	µg/kg	410	4.6 U	52 U	0.74 J	48 U	0.078
cis-1,3-Dichloropropene	µg/kg	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U
Cyclohexane	µg/kg	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U
Dibromochloromethane	µg/kg	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U
Dichlorodifluoromethane (CFC-12)	µg/kg	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U
Ethylbenzene	µg/kg	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U
Isopropyl benzene	µg/kg	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U
Methyl acetate	µg/kg	320 U	23 U	260 U	18 U	240 U	0.25 U
Methyl cyclohexane	µg/kg	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U
Methyl tert butyl ether (MTBE)	µg/kg	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U
Methylene chloride	µg/kg	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U
Styrene	µg/kg	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U
Tetrachloroethene	µg/kg	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U
Toluene	µg/kg	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U
trans-1,2-Dichloroethene	µg/kg	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U
trans-1,3-Dichloropropene	µg/kg	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U
Trichloroethene	µg/kg	490	33	170	45	170	0.51
Trichlorofluoromethane (CFC-11)	µg/kg	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U
Trifluorotrichloroethane (CFC-113)	µg/kg	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U
Vinyl chloride	µg/kg	63 U	4.6 U	52 U	3.6 U	48 U	0.050 U
Xylenes (total)	µg/kg	130 U	9.1 U	100 U	7.2 U	95 U	0.10 U
General Chemistry							
Fraction organic carbon (FOC)	%	-	-	-	-	-	-

Notes:

- J - Estimated concentration
- U - Not detected at the associated reporting limit
- UJ - Not detected; associated reporting limit is estimated
- R - Rejected
- ft. bgs - Feet Below Ground Surface
- = Not applicable

Table 2B

Analytical Results Summary
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Location ID:		GP-40	GP-40	GP-40	GP-40	GP-42	GP-42
Sample Name:		S-11219347-111020-AMC-035	S-11219347-111020-AMC-036	S-11219347-111020-AMC-038	S-11219347-111020-AMC-042	S-11219347-111320-AMC-111	S-11219347-111320-AMC-112
Sample Date:		11/10/2020	11/10/2020	11/10/2020	11/10/2020	11/13/2020	11/13/2020
Depth:		7-9 ft. bgs	9-11 ft. bgs	11-13 ft. bgs	13-15.5 ft. bgs	9-11 ft. bgs	11-13 ft. bgs
Parameters	Unit						
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/kg	0.045 U	0.13 U	0.20 U	0.051 U	10	52 U
1,1,2,2-Tetrachloroethane	µg/kg	0.045 U	0.13 U	0.20 U	0.051 U	4.2 U	52 U
1,1,2-Trichloroethane	µg/kg	0.045 U	0.13 U	0.20 U	0.051 U	4.2 U	52 U
1,1-Dichloroethane	µg/kg	0.045 U	0.13 U	0.20 U	0.051 U	4.2 U	52 U
1,1-Dichloroethene	µg/kg	0.045 U	0.13 U	0.20 U	0.051 U	1.2 J	52 U
1,2,4-Trichlorobenzene	µg/kg	0.045 U	0.13 U	0.20 U	0.051 U	4.2 U	52 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	0.045 U	0.13 U	0.20 U	0.051 U	4.2 U	52 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	0.045 U	0.13 U	0.20 U	0.051 U	4.2 U	52 U
1,2-Dichlorobenzene	µg/kg	0.045 U	0.13 U	0.20 U	0.051 U	4.2 U	52 U
1,2-Dichloroethane	µg/kg	0.045 U	0.13 U	0.20 U	0.051 U	4.2 U	52 U
1,2-Dichloropropane	µg/kg	0.045 U	0.13 U	0.20 U	0.051 U	4.2 U	52 U
1,3-Dichlorobenzene	µg/kg	0.045 U	0.13 U	0.20 U	0.051 U	4.2 U	52 U
1,4-Dichlorobenzene	µg/kg	0.045 U	0.13 U	0.20 U	0.051 U	4.2 U	52 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	0.23 U	0.63 U	0.99 U	0.25 U	21 U	260 U
2-Hexanone	µg/kg	0.23 U	0.63 U	0.99 U	0.25 U	21 U	260 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	0.23 U	0.63 U	0.99 U	0.25 U	21 U	260 U
Acetone	µg/kg	0.23 U	0.63 U	0.99 U	0.25 U	21 U	260 U
Benzene	µg/kg	0.045 U	0.13 U	0.20 U	0.051 U	4.2 U	52 U
Bromodichloromethane	µg/kg	0.045 U	0.13 U	0.20 U	0.051 U	4.2 U	52 U
Bromoform	µg/kg	0.045 U	0.13 U	0.20 U	0.051 U	4.2 U	52 U
Bromomethane (Methyl bromide)	µg/kg	0.045 U	0.13 U	0.20 U	0.051 U	4.2 U	52 U
Carbon disulfide	µg/kg	0.045 U	0.13 U	0.20 U	0.051 U	4.2 U	52 U
Carbon tetrachloride	µg/kg	0.045 U	0.13 U	0.20 U	0.051 U	4.2 U	52 U
Chlorobenzene	µg/kg	0.045 U	0.13 U	0.20 U	0.051 U	4.2 U	52 U
Chloroethane	µg/kg	0.045 U	0.13 U	0.20 U	0.051 U	4.2 U	52 U
Chloroform (Trichloromethane)	µg/kg	0.045 U	0.13 U	0.20 U	0.051 U	4.2 U	52 U
Chloromethane (Methyl chloride)	µg/kg	0.045 U	0.13 U	0.20 U	0.051 U	4.2 U	52 U
cis-1,2-Dichloroethene	µg/kg	0.045 U	0.13 U	0.20 U	0.051 U	4.2 U	52 U
cis-1,3-Dichloropropene	µg/kg	0.045 U	0.13 U	0.20 U	0.051 U	4.2 U	52 U
Cyclohexane	µg/kg	0.045 U	0.13 U	0.20 U	0.051 U	4.2 U	52 U
Dibromochloromethane	µg/kg	0.045 U	0.13 U	0.20 U	0.051 U	4.2 U	52 U
Dichlorodifluoromethane (CFC-12)	µg/kg	0.045 U	0.13 U	0.20 U	0.051 U	4.2 U	52 U
Ethylbenzene	µg/kg	0.045 U	0.13 U	0.20 U	0.051 U	4.2 U	52 U
Isopropyl benzene	µg/kg	0.045 U	0.13 U	0.20 U	0.051 U	4.2 U	52 U
Methyl acetate	µg/kg	0.23 U	0.63 U	0.99 U	0.25 U	21 U	260 U
Methyl cyclohexane	µg/kg	0.045 U	0.13 U	0.20 U	0.051 U	4.2 U	52 U
Methyl tert butyl ether (MTBE)	µg/kg	0.045 U	0.13 U	0.20 U	0.051 U	4.2 U	52 U
Methylene chloride	µg/kg	0.045 U	0.13 U	0.20 U	0.051 U	4.2 U	52 U
Styrene	µg/kg	0.045 U	0.13 U	0.20 U	0.051 U	4.2 U	52 U
Tetrachloroethene	µg/kg	0.045 U	0.13 U	0.20 U	0.051 U	4.2 U	52 U
Toluene	µg/kg	0.045 U	0.13 U	0.20 U	0.051 U	4.2 U	52 U
trans-1,2-Dichloroethene	µg/kg	0.045 U	0.13 U	0.20 U	0.051 U	4.2 U	52 U
trans-1,3-Dichloropropene	µg/kg	0.045 U	0.13 U	0.20 U	0.051 U	4.2 U	52 U
Trichloroethene	µg/kg	0.28	0.54	0.31	0.13	22	91
Trichlorofluoromethane (CFC-11)	µg/kg	0.045 U	0.13 U	0.20 U	0.051 U	4.2 U	52 U
Trifluorotrichloroethane (CFC-113)	µg/kg	0.045 U	0.13 U	0.20 U	0.051 U	4.2 U	52 U
Vinyl chloride	µg/kg	0.045 U	0.13 U	0.20 U	0.051 U	4.2 U	52 U
Xylenes (total)	µg/kg	0.091 U	0.25 U	0.40 U	0.10 U	8.4 U	100 U
General Chemistry							
Fraction organic carbon (FOC)	%	-	-	-	-	-	-

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit
UJ - Not detected; associated reporting limit is estimated
R - Rejected
ft. bgs - Feet Below Ground Surface
- = Not applicable

Table 2B

Analytical Results Summary
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Location ID: Sample Name: Sample Date: Depth:		GP-42 S-11219347-111320-AMC-113 11/13/2020 13-15 ft. bgs	GP-42 S-11219347-111320-AMC-114 11/13/2020 15-16.4 ft. bgs	GP-44 S-11219347-111320-AMC-116 11/13/2020 12-14 ft. bgs	GP-44 S-11219347-111320-AMC-117 11/13/2020 14-15.8 ft. bgs	GP-44 S-11219347-111320-AMC-118 11/13/2020 15.6-15.8 ft. bgs	GP-45 S-11219347-111020-AMC-029 11/10/2020 6-8 ft. bgs
Parameters	Unit						
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/kg	15	8.2	170	240	-	32 J
1,1,2,2-Tetrachloroethane	µg/kg	4.0 U	3.9 U	63 U	64 U	-	60 U
1,1,2-Trichloroethane	µg/kg	4.0 U	3.9 U	63 U	64 U	-	60 U
1,1-Dichloroethane	µg/kg	4.0 U	3.9 U	63 U	64 U	-	60 U
1,1-Dichloroethene	µg/kg	1.4 J	0.81 J	63 U	64 U	-	60 U
1,2,4-Trichlorobenzene	µg/kg	4.0 U	3.9 U	63 U	64 U	-	60 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	4.0 U	3.9 U	63 U	64 U	-	60 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	4.0 U	3.9 U	63 U	64 U	-	60 U
1,2-Dichlorobenzene	µg/kg	4.0 U	3.9 U	63 U	64 U	-	60 U
1,2-Dichloroethane	µg/kg	4.0 U	3.9 U	63 U	64 U	-	60 U
1,2-Dichloropropane	µg/kg	4.0 U	3.9 U	63 U	64 U	-	60 U
1,3-Dichlorobenzene	µg/kg	4.0 U	3.9 U	63 U	64 U	-	60 U
1,4-Dichlorobenzene	µg/kg	4.0 U	3.9 U	63 U	64 U	-	60 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	20 U	19 U	320 U	320 U	-	300 U
2-Hexanone	µg/kg	20 U	19 U	320 U	320 U	-	300 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	20 U	19 U	320 U	320 U	-	300 U
Acetone	µg/kg	20 U	19 U	320 U	320 U	-	300 U
Benzene	µg/kg	4.0 U	3.9 U	63 U	64 U	-	60 U
Bromodichloromethane	µg/kg	4.0 U	3.9 U	63 U	64 U	-	60 U
Bromoform	µg/kg	4.0 U	3.9 U	63 U	64 U	-	60 U
Bromomethane (Methyl bromide)	µg/kg	4.0 U	3.9 U	63 U	64 U	-	60 U
Carbon disulfide	µg/kg	4.0 U	3.9 U	63 U	64 U	-	60 U
Carbon tetrachloride	µg/kg	4.0 U	3.9 U	63 U	64 U	-	60 U
Chlorobenzene	µg/kg	4.0 U	3.9 U	63 U	64 U	-	60 U
Chloroethane	µg/kg	4.0 U	3.9 U	63 U	64 U	-	60 U
Chloroform (Trichloromethane)	µg/kg	4.0 U	3.9 U	63 U	64 U	-	60 U
Chloromethane (Methyl chloride)	µg/kg	4.0 U	3.9 U	63 U	64 U	-	60 U
cis-1,2-Dichloroethene	µg/kg	4.0 U	3.9 U	63 U	47 J	-	60 U
cis-1,3-Dichloropropene	µg/kg	4.0 U	3.9 U	63 U	64 U	-	60 U
Cyclohexane	µg/kg	4.0 U	3.9 U	63 U	64 U	-	60 U
Dibromochloromethane	µg/kg	4.0 U	3.9 U	63 U	64 U	-	60 U
Dichlorodifluoromethane (CFC-12)	µg/kg	4.0 U	3.9 U	63 U	64 U	-	60 U
Ethylbenzene	µg/kg	4.0 U	3.9 U	63 U	64 U	-	60 U
Isopropyl benzene	µg/kg	4.0 U	3.9 U	63 U	64 U	-	60 U
Methyl acetate	µg/kg	20 U	19 U	320 U	320 U	-	300 U
Methyl cyclohexane	µg/kg	4.0 U	3.9 U	63 U	64 U	-	60 U
Methyl tert butyl ether (MTBE)	µg/kg	4.0 U	3.9 U	63 U	64 U	-	60 U
Methylene chloride	µg/kg	4.0 U	3.9 U	63 U	64 U	-	60 U
Styrene	µg/kg	4.0 U	3.9 U	63 U	64 U	-	60 U
Tetrachloroethene	µg/kg	4.0 U	3.9 U	63 U	64 U	-	60 U
Toluene	µg/kg	4.0 U	3.9 U	63 U	64 U	-	60 U
trans-1,2-Dichloroethene	µg/kg	4.0 U	3.9 U	63 U	64 U	-	60 U
trans-1,3-Dichloropropene	µg/kg	4.0 U	3.9 U	63 U	64 U	-	60 U
Trichloroethene	µg/kg	17	12	550	900	-	310
Trichlorofluoromethane (CFC-11)	µg/kg	4.0 U	3.9 U	63 U	64 U	-	60 U
Trifluorotrichloroethane (CFC-113)	µg/kg	4.0 U	3.9 U	63 U	64 U	-	60 U
Vinyl chloride	µg/kg	4.0 U	3.9 U	63 U	64 U	-	60 U
Xylenes (total)	µg/kg	7.9 U	7.7 U	130 U	130 U	-	120 U
General Chemistry							
Fraction organic carbon (FOC)	%	-	-	-	-	0.3	-

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit
UJ - Not detected; associated reporting limit is estimated
R - Rejected
ft. bgs - Feet Below Ground Surface
- = Not applicable

Table 2B

Analytical Results Summary
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Location ID:		GP-45	GP-45	GP-45	GP-45	GP-47	GP-47
Sample Name:		S-11219347-111020-AMC-030	S-11219347-111020-AMC-031	S-11219347-111020-AMC-033	S-11219347-111020-AMC-032	S-11219347-111820-AMC-181	S-11219347-111820-AMC-182
Sample Date:		11/10/2020	11/10/2020	11/10/2020	11/10/2020	11/18/2020	11/18/2020
Depth:		9-11 ft. bgs	11-13 ft. bgs	11-13 ft. bgs	13-15.3 ft. bgs	2.8-4.6 ft. bgs	2.8-4.6 ft. bgs
Parameters	Unit						Duplicate
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/kg	27 J	42 J	-	5.8	510	610
1,1,2,2-Tetrachloroethane	µg/kg	49 U	51 U	-	3.8 U	48 U	60 U
1,1,2-Trichloroethane	µg/kg	49 U	51 U	-	3.8 U	48 U	60 U
1,1-Dichloroethane	µg/kg	49 U	51 U	-	2.1 J	48 U	60 U
1,1-Dichloroethene	µg/kg	49 U	51 U	-	13	33 J	47 J
1,2,4-Trichlorobenzene	µg/kg	49 U	51 U	-	3.8 U	48 U	60 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	49 U	51 U	-	3.8 U	48 U	60 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	49 U	51 U	-	3.8 U	48 U	60 U
1,2-Dichlorobenzene	µg/kg	49 U	51 U	-	3.8 U	48 U	60 U
1,2-Dichloroethane	µg/kg	49 U	51 U	-	3.8 U	48 U	60 U
1,2-Dichloropropane	µg/kg	49 U	51 U	-	3.8 U	48 U	60 U
1,3-Dichlorobenzene	µg/kg	49 U	51 U	-	3.8 U	48 U	60 U
1,4-Dichlorobenzene	µg/kg	49 U	51 U	-	3.8 U	48 U	60 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	240 U	260 U	-	19 U	240 U	300 U
2-Hexanone	µg/kg	240 U	260 U	-	19 U	240 U	300 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	240 U	260 U	-	19 U	240 U	300 U
Acetone	µg/kg	240 U	260 U	-	19 U	240 U	300 U
Benzene	µg/kg	49 U	51 U	-	0.19 J	48 U	60 U
Bromodichloromethane	µg/kg	49 U	51 U	-	3.8 U	48 U	60 U
Bromoform	µg/kg	49 U	51 U	-	3.8 U	48 U	60 U
Bromomethane (Methyl bromide)	µg/kg	49 U	51 U	-	3.8 U	48 U	60 U
Carbon disulfide	µg/kg	49 U	51 U	-	3.8 U	48 U	60 U
Carbon tetrachloride	µg/kg	49 U	51 U	-	3.8 U	48 U	60 U
Chlorobenzene	µg/kg	49 U	51 U	-	3.8 U	48 U	60 U
Chloroethane	µg/kg	49 U	51 U	-	3.8 U	48 U	60 U
Chloroform (Trichloromethane)	µg/kg	49 U	51 U	-	0.37 J	48 U	60 U
Chloromethane (Methyl chloride)	µg/kg	49 U	51 U	-	3.8 U	48 U	60 U
cis-1,2-Dichloroethene	µg/kg	49 U	51 U	-	3.8 U	92	160
cis-1,3-Dichloropropene	µg/kg	49 U	51 U	-	3.8 U	48 U	60 U
Cyclohexane	µg/kg	49 U	51 U	-	3.8 U	48 U	60 U
Dibromochloromethane	µg/kg	49 U	51 U	-	3.8 U	48 U	60 U
Dichlorodifluoromethane (CFC-12)	µg/kg	49 U	51 U	-	3.8 U	48 U	60 U
Ethylbenzene	µg/kg	49 U	51 U	-	3.8 U	48 U	60 U
Isopropyl benzene	µg/kg	49 U	51 U	-	3.8 U	48 U	60 U
Methyl acetate	µg/kg	240 U	260 U	-	19 U	240 U	300 U
Methyl cyclohexane	µg/kg	49 U	51 U	-	3.8 U	48 U	60 U
Methyl tert butyl ether (MTBE)	µg/kg	49 U	51 U	-	3.8 U	48 U	60 U
Methylene chloride	µg/kg	49 U	51 U	-	3.8 U	48 U	60 U
Styrene	µg/kg	49 U	51 U	-	3.8 U	48 U	60 U
Tetrachloroethene	µg/kg	49 U	51 U	-	3.8 U	48 U	60 U
Toluene	µg/kg	49 U	51 U	-	0.29 J	48 U	60 U
trans-1,2-Dichloroethene	µg/kg	49 U	51 U	-	3.8 U	48 U	60 U
trans-1,3-Dichloropropene	µg/kg	49 U	51 U	-	3.8 U	48 U	60 U
Trichloroethene	µg/kg	410	310	-	4.4	910	1600
Trichlorofluoromethane (CFC-11)	µg/kg	49 U	51 U	-	3.8 U	48 U	60 U
Trifluorotrichloroethane (CFC-113)	µg/kg	49 U	51 U	-	3.8 U	48 U	60 U
Vinyl chloride	µg/kg	49 U	51 U	-	3.8 U	48 U	60 U
Xylenes (total)	µg/kg	97 U	100 U	-	7.6 U	96 U	120 U
General Chemistry							
Fraction organic carbon (FOC)	%	-	-	0.5	-	-	-

Notes:

- J - Estimated concentration
- U - Not detected at the associated reporting limit
- UJ - Not detected; associated reporting limit is estimated
- R - Rejected
- ft. bgs - Feet Below Ground Surface
- = Not applicable

Table 2B

Analytical Results Summary
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Location ID:		GP-48	GP-49	GP-49	GP-49	GP-49	GP-49
Sample Name:		S-11219347-111820-AMC-183	S-11219347-112520-AMC-203	S-11219347-112520-AMC-204	S-11219347-112520-AMC-205	S-11219347-112520-AMC-206	S-11219347-112520-AMC-207
Sample Date:		11/18/2020	11/25/2020	11/25/2020	11/25/2020	11/25/2020	11/25/2020
Depth:		4-5.4 ft. bgs	8-10 ft. bgs	10-12 ft. bgs	12-14 ft. bgs	14-16.3 ft. bgs	14-16.3 ft. bgs
Parameters	Unit						Duplicate
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/kg	9100	1.7 J	2.6 J	4.1	4.0 U	0.63 J
1,1,2,2-Tetrachloroethane	µg/kg	1200 U	4.6 U	4.1 UJ	3.7 U	4.0 U	4.0 U
1,1,2-Trichloroethane	µg/kg	1200 U	4.6 U	4.1 UJ	3.7 U	4.0 U	4.0 U
1,1-Dichloroethane	µg/kg	1200 U	4.6 U	4.1 U	0.49 J	4.0 U	4.0 U
1,1-Dichloroethene	µg/kg	1200 U	4.6 U	0.58 J	2.0 J	4.0 U	4.0 U
1,2,4-Trichlorobenzene	µg/kg	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	1200 U	4.6 U	4.1 UJ	3.7 U	4.0 U	4.0 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	1200 U	4.6 U	4.1 UJ	3.7 U	4.0 U	4.0 U
1,2-Dichlorobenzene	µg/kg	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U
1,2-Dichloroethane	µg/kg	1200 U	4.6 U	4.1 UJ	3.7 U	4.0 U	4.0 U
1,2-Dichloropropane	µg/kg	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U
1,3-Dichlorobenzene	µg/kg	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U
1,4-Dichlorobenzene	µg/kg	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	5800 U	23 U	20 UJ	19 U	20 U	20 U
2-Hexanone	µg/kg	5800 U	23 U	20 U	19 U	20 U	20 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	5800 U	23 U	20 U	19 U	20 U	20 U
Acetone	µg/kg	5800 U	23 U	20 U	19 U	20 U	20 U
Benzene	µg/kg	1200 U	4.6 U	4.1 UJ	3.7 U	4.0 U	4.0 U
Bromodichloromethane	µg/kg	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U
Bromoform	µg/kg	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U
Bromomethane (Methyl bromide)	µg/kg	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U
Carbon disulfide	µg/kg	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U
Carbon tetrachloride	µg/kg	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U
Chlorobenzene	µg/kg	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U
Chloroethane	µg/kg	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U
Chloroform (Trichloromethane)	µg/kg	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	0.25 J
Chloromethane (Methyl chloride)	µg/kg	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U
cis-1,2-Dichloroethene	µg/kg	2100	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U
cis-1,3-Dichloropropene	µg/kg	1200 U	4.6 U	4.1 UJ	3.7 U	4.0 U	4.0 U
Cyclohexane	µg/kg	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U
Dibromochloromethane	µg/kg	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U
Dichlorodifluoromethane (CFC-12)	µg/kg	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U
Ethylbenzene	µg/kg	1200 U	4.6 U	4.1 UJ	3.7 U	4.0 U	4.0 U
Isopropyl benzene	µg/kg	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U
Methyl acetate	µg/kg	5800 U	23 U	20 U	19 U	20 U	20 U
Methyl cyclohexane	µg/kg	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U
Methyl tert butyl ether (MTBE)	µg/kg	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U
Methylene chloride	µg/kg	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U
Styrene	µg/kg	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U
Tetrachloroethene	µg/kg	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U
Toluene	µg/kg	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U
trans-1,2-Dichloroethene	µg/kg	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U
trans-1,3-Dichloropropene	µg/kg	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U
Trichloroethene	µg/kg	42000	11	18	33	52	46
Trichlorofluoromethane (CFC-11)	µg/kg	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U
Trifluorotrichloroethane (CFC-113)	µg/kg	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U
Vinyl chloride	µg/kg	1200 U	4.6 U	4.1 U	3.7 U	4.0 U	4.0 U
Xylenes (total)	µg/kg	2300 U	9.1 U	8.2 U	7.5 U	8.0 U	8.0 U
General Chemistry							
Fraction organic carbon (FOC)	%	-	-	-	-	-	-

Notes:

- J - Estimated concentration
- U - Not detected at the associated reporting limit
- UJ - Not detected; associated reporting limit is estimated
- R - Rejected
- ft. bgs - Feet Below Ground Surface
- = Not applicable

Table 2B

Analytical Results Summary
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Location ID: Sample Name: Sample Date: Depth:		GP-50 S-11219347-111220-AMC-081 11/12/2020 4-4.6 ft. bgs	GP-51 S-11219347-111020-AMC-022 11/10/2020 2-4 ft. bgs	GP-51 S-11219347-111020-AMC-023 11/10/2020 4-6 ft. bgs	GP-51 S-11219347-111020-AMC-024 11/10/2020 6-8 ft. bgs	GP-51 S-11219347-111020-AMC-025 11/10/2020 8-10 ft. bgs	GP-51 S-11219347-111020-AMC-026 11/10/2020 8-10 ft. bgs Duplicate
Parameters	Unit						
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/kg	4.8 U	55 J	57 U	170 J	25 J	50 U
1,1,2,2-Tetrachloroethane	µg/kg	4.8 U	110 U	57 U	260 U	49 U	50 U
1,1,2-Trichloroethane	µg/kg	4.8 U	110 U	57 U	260 U	49 U	50 U
1,1-Dichloroethane	µg/kg	4.8 U	110 U	57 U	260 U	49 U	50 U
1,1-Dichloroethene	µg/kg	4.8 U	110 U	57 U	260 U	49 U	50 U
1,2,4-Trichlorobenzene	µg/kg	4.8 U	110 U	57 U	260 U	49 U	50 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	4.8 U	110 U	57 U	260 U	49 U	50 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	4.8 U	110 U	57 U	260 U	49 U	50 U
1,2-Dichlorobenzene	µg/kg	4.8 U	110 U	57 U	260 U	49 U	50 U
1,2-Dichloroethane	µg/kg	4.8 U	110 U	57 U	260 U	49 U	50 U
1,2-Dichloropropane	µg/kg	4.8 U	110 U	57 U	260 U	49 U	50 U
1,3-Dichlorobenzene	µg/kg	4.8 U	110 U	57 U	260 U	49 U	50 U
1,4-Dichlorobenzene	µg/kg	4.8 U	110 U	57 U	260 U	49 U	50 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	24 U	570 U	280 U	1300 U	250 U	250 U
2-Hexanone	µg/kg	24 U	570 U	280 U	1300 U	250 U	250 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	24 U	570 U	280 U	1300 U	250 U	250 U
Acetone	µg/kg	14 J	570 U	280 U	1300 U	250 U	250 U
Benzene	µg/kg	4.8 U	110 U	21 J	260 U	49 U	50 U
Bromodichloromethane	µg/kg	4.8 U	110 U	57 U	260 U	49 U	50 U
Bromoform	µg/kg	4.8 U	110 U	57 U	260 U	49 U	50 U
Bromomethane (Methyl bromide)	µg/kg	4.8 U	110 U	57 U	260 U	49 U	50 U
Carbon disulfide	µg/kg	4.8 U	110 U	57 U	260 U	49 U	50 U
Carbon tetrachloride	µg/kg	4.8 U	110 U	57 U	260 U	49 U	50 U
Chlorobenzene	µg/kg	4.8 U	110 U	57 U	260 U	49 U	50 U
Chloroethane	µg/kg	4.8 U	110 U	57 U	260 U	49 U	50 U
Chloroform (Trichloromethane)	µg/kg	4.8 U	110 U	57 U	260 U	49 U	50 U
Chloromethane (Methyl chloride)	µg/kg	4.8 U	110 U	57 U	260 U	49 U	50 U
cis-1,2-Dichloroethene	µg/kg	4.8 U	330	57 U	320	59	86
cis-1,3-Dichloropropene	µg/kg	4.8 U	110 U	57 U	260 U	49 U	50 U
Cyclohexane	µg/kg	1.5 J	110 U	57 U	260 U	49 U	50 U
Dibromochloromethane	µg/kg	4.8 U	110 U	57 U	260 U	49 U	50 U
Dichlorodifluoromethane (CFC-12)	µg/kg	4.8 U	110 U	57 U	260 U	49 U	50 U
Ethylbenzene	µg/kg	4.8 U	110 U	57 U	260 U	49 U	50 U
Isopropyl benzene	µg/kg	4.8 U	110 U	57 U	260 U	49 U	50 U
Methyl acetate	µg/kg	24 U	570 U	280 U	1300 U	250 U	250 U
Methyl cyclohexane	µg/kg	1.3 J	110 U	57 U	260 U	49 U	50 U
Methyl tert butyl ether (MTBE)	µg/kg	4.8 U	110 U	57 U	260 U	49 U	50 U
Methylene chloride	µg/kg	4.8 U	110 U	57 U	260 U	49 U	50 U
Styrene	µg/kg	4.8 U	110 U	57 U	260 U	49 U	50 U
Tetrachloroethene	µg/kg	4.8 U	110 U	57 U	260 U	49 U	50 U
Toluene	µg/kg	4.8 U	110 U	79	260	49 U	50 U
trans-1,2-Dichloroethene	µg/kg	4.8 U	110 U	57 U	260 U	49 U	50 U
trans-1,3-Dichloropropene	µg/kg	4.8 U	110 U	57 U	260 U	49 U	50 U
Trichloroethene	µg/kg	4.8 U	4900	300	13000	970	2000
Trichlorofluoromethane (CFC-11)	µg/kg	4.8 U	110 U	57 U	260 U	49 U	50 U
Trifluorotrichloroethane (CFC-113)	µg/kg	4.8 U	110 U	57 U	260 U	49 U	50 U
Vinyl chloride	µg/kg	4.8 U	110 U	57 U	260 U	49 U	50 U
Xylenes (total)	µg/kg	9.6 U	230 U	110	320 J	99 U	100 U
General Chemistry							
Fraction organic carbon (FOC)	%	-	-	-	-	-	-

Notes:

- J - Estimated concentration
- U - Not detected at the associated reporting limit
- UJ - Not detected; associated reporting limit is estimated
- R - Rejected
- ft. bgs - Feet Below Ground Surface
- = Not applicable

Table 2B

Analytical Results Summary
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Location ID:		GP-51	GP-51	GP-52	GP-52	GP-53	GP-53
Sample Name:		S-11219347-111020-AMC-027	S-11219347-111020-AMC-028	S-11219347-111220-AMC-079	S-11219347-111220-AMC-080	S-11219347-111220-AMC-082	S-11219347-111220-AMC-083
Sample Date:		11/10/2020	11/10/2020	11/12/2020	11/12/2020	11/12/2020	11/12/2020
Depth:		10-12.3 ft. bgs	10-11.5 ft. bgs	2-4 ft. bgs	2-4 ft. bgs Duplicate	2-4 ft. bgs	4-5.6 ft. bgs
Parameters	Unit						
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/kg	1.3 J	-	4.6 U	3.9 U	230 U	3.6 U
1,1,2,2-Tetrachloroethane	µg/kg	4.5 UJ	-	4.6 U	3.9 U	230 U	3.6 U
1,1,2-Trichloroethane	µg/kg	4.5 UJ	-	4.6 U	3.9 U	230 UJ	3.6 U
1,1-Dichloroethane	µg/kg	4.5 U	-	4.6 U	3.9 U	230 U	3.9
1,1-Dichloroethene	µg/kg	4.5 U	-	4.6 U	3.9 U	230 U	3.6 U
1,2,4-Trichlorobenzene	µg/kg	4.5 U	-	4.6 U	3.9 U	230 U	3.6 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	4.5 UJ	-	4.6 U	3.9 U	230 U	3.6 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	4.5 UJ	-	4.6 U	3.9 U	230 U	3.6 U
1,2-Dichlorobenzene	µg/kg	4.5 U	-	4.6 U	3.9 U	230 U	3.6 U
1,2-Dichloroethane	µg/kg	4.5 UJ	-	4.6 U	3.9 U	230 U	0.62 J
1,2-Dichloropropane	µg/kg	4.5 U	-	4.6 U	3.9 U	230 U	3.6 U
1,3-Dichlorobenzene	µg/kg	4.5 U	-	4.6 U	3.9 U	230 U	3.6 U
1,4-Dichlorobenzene	µg/kg	4.5 U	-	4.6 U	3.9 U	230 U	3.6 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	23 UJ	-	4.9 J	20 U	1200 U	18 U
2-Hexanone	µg/kg	23 UJ	-	23 U	20 U	1200 U	18 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	23 UJ	-	23 U	20 U	1200 U	18 U
Acetone	µg/kg	23 UJ	-	23	20 U	1200 U	11 J
Benzene	µg/kg	4.5 U	-	4.6 U	3.9 U	230 U	3.6 U
Bromodichloromethane	µg/kg	4.5 U	-	4.6 U	3.9 U	230 U	3.6 U
Bromoform	µg/kg	4.5 U	-	4.6 U	3.9 U	230 U	3.6 U
Bromomethane (Methyl bromide)	µg/kg	4.5 U	-	4.6 U	3.9 U	230 U	3.6 U
Carbon disulfide	µg/kg	4.5 U	-	4.6 U	3.9 U	230 U	3.6 U
Carbon tetrachloride	µg/kg	4.5 U	-	4.6 U	3.9 U	230 U	3.6 U
Chlorobenzene	µg/kg	4.5 U	-	4.6 U	3.9 U	230 U	3.6 U
Chloroethane	µg/kg	4.5 U	-	4.6 U	3.9 U	230 U	3.6 U
Chloroform (Trichloromethane)	µg/kg	4.5 U	-	4.6 U	3.9 U	230 U	3.6 U
Chloromethane (Methyl chloride)	µg/kg	4.5 U	-	4.6 U	3.9 U	230 U	3.6 U
cis-1,2-Dichloroethene	µg/kg	0.63 J	-	4.6 U	3.9 U	230 U	25
cis-1,3-Dichloropropene	µg/kg	4.5 U	-	4.6 U	3.9 U	230 U	3.6 U
Cyclohexane	µg/kg	4.5 U	-	4.6 U	3.9 U	230 U	3.6 U
Dibromochloromethane	µg/kg	4.5 U	-	4.6 U	3.9 U	230 U	3.6 U
Dichlorodifluoromethane (CFC-12)	µg/kg	4.5 U	-	4.6 U	3.9 U	230 U	3.6 U
Ethylbenzene	µg/kg	4.5 U	-	4.6 U	3.9 U	230 U	3.6 U
Isopropyl benzene	µg/kg	4.5 U	-	4.6 U	3.9 U	230 U	3.6 U
Methyl acetate	µg/kg	23 U	-	23 U	20 U	1200 U	18 U
Methyl cyclohexane	µg/kg	4.5 U	-	4.6 U	3.9 U	230 U	0.75 J
Methyl tert butyl ether (MTBE)	µg/kg	4.5 U	-	4.6 U	3.9 U	230 U	3.6 U
Methylene chloride	µg/kg	4.5 U	-	4.6 U	3.9 U	230 U	3.6 U
Styrene	µg/kg	4.5 U	-	4.6 U	3.9 U	230 U	3.6 U
Tetrachloroethene	µg/kg	4.5 U	-	4.6 U	3.9 U	230 U	3.6 U
Toluene	µg/kg	4.5 U	-	4.6 U	3.9 U	230 U	3.6 U
trans-1,2-Dichloroethene	µg/kg	4.5 U	-	4.6 U	3.9 U	230 U	0.59 J
trans-1,3-Dichloropropene	µg/kg	4.5 U	-	4.6 U	3.9 U	230 U	3.6 U
Trichloroethene	µg/kg	13	-	4.6 U	3.9 U	230 U	3.6 U
Trichlorofluoromethane (CFC-11)	µg/kg	4.5 U	-	4.6 U	3.9 U	230 U	3.6 U
Trifluorotrichloroethane (CFC-113)	µg/kg	4.5 U	-	4.6 U	3.9 U	230 U	3.6 U
Vinyl chloride	µg/kg	4.5 U	-	4.6 U	3.9 U	230 U	7.0
Xylenes (total)	µg/kg	9.0 U	-	9.2 U	7.9 U	460 U	7.2 U
General Chemistry							
Fraction organic carbon (FOC)	%	-	0.2	-	-	-	-

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit
UJ - Not detected; associated reporting limit is estimated
R - Rejected
ft. bgs - Feet Below Ground Surface
- = Not applicable

Table 2B

Analytical Results Summary
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Location ID:		GP-53	GP-54	GP-54	GP-55	GP-56	GP-56
Sample Name:		S-11219347-111220-AMC-084	S-11219347-111220-AMC-085	S-11219347-111220-AMC-086	S-11219347-111820-AMC-184	S-11219347-111220-AMC-100	S-11219347-111220-AMC-101
Sample Date:		11/12/2020	11/12/2020	11/12/2020	11/18/2020	11/12/2020	11/12/2020
Depth:		5-5.6 ft. bgs	2.5-4 ft. bgs	4-5.2 ft. bgs	5-6.8 ft. bgs	8-10 ft. bgs	10-10.6 ft. bgs
Parameters	Unit						
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/kg	-	53 U	75	1900	130	500
1,1,2,2-Tetrachloroethane	µg/kg	-	53 U	50 U	120 U	66 U	190 U
1,1,2-Trichloroethane	µg/kg	-	53 U	50 U	120 U	66 U	190 U
1,1-Dichloroethane	µg/kg	-	53 U	28 J	310	66 U	190 U
1,1-Dichloroethene	µg/kg	-	53 U	91	1200	66 U	190 U
1,2,4-Trichlorobenzene	µg/kg	-	53 U	50 U	120 U	66 U	190 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	-	53 U	50 U	120 U	66 U	190 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	-	53 U	50 U	120 U	66 U	190 U
1,2-Dichlorobenzene	µg/kg	-	53 U	50 U	120 U	66 U	190 U
1,2-Dichloroethane	µg/kg	-	53 U	50 U	120 U	66 U	190 U
1,2-Dichloropropane	µg/kg	-	53 U	50 U	120 U	66 U	190 U
1,3-Dichlorobenzene	µg/kg	-	53 U	50 U	120 U	66 U	190 U
1,4-Dichlorobenzene	µg/kg	-	53 U	50 U	120 U	66 U	190 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	-	260 U	250 U	610 U	330 U	960 U
2-Hexanone	µg/kg	-	260 U	250 U	610 U	330 U	960 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	-	260 U	250 U	610 U	330 U	960 U
Acetone	µg/kg	-	260 U	250 U	610 U	330 U	960 U
Benzene	µg/kg	-	53 U	50 U	120 U	66 U	190 U
Bromodichloromethane	µg/kg	-	53 U	50 U	120 U	66 U	190 U
Bromoform	µg/kg	-	53 U	50 U	120 U	66 U	190 U
Bromomethane (Methyl bromide)	µg/kg	-	53 U	50 U	120 U	66 U	190 U
Carbon disulfide	µg/kg	-	53 U	50 U	120 U	66 U	190 U
Carbon tetrachloride	µg/kg	-	53 U	50 U	120 U	66 U	190 U
Chlorobenzene	µg/kg	-	53 U	50 U	120 U	66 U	190 U
Chloroethane	µg/kg	-	53 U	50 U	120 U	66 U	190 U
Chloroform (Trichloromethane)	µg/kg	-	53 U	50 U	120 U	66 U	190 U
Chloromethane (Methyl chloride)	µg/kg	-	53 U	50 U	120 U	66 U	190 U
cis-1,2-Dichloroethene	µg/kg	-	180	1400	5300	39 J	190 U
cis-1,3-Dichloropropene	µg/kg	-	53 U	50 U	120 U	66 U	190 U
Cyclohexane	µg/kg	-	53 U	50 U	120 U	66 U	190 U
Dibromochloromethane	µg/kg	-	53 U	50 U	120 U	66 U	190 U
Dichlorodifluoromethane (CFC-12)	µg/kg	-	53 U	50 U	120 U	66 U	190 U
Ethylbenzene	µg/kg	-	53 U	50 U	120 U	66 U	190 U
Isopropyl benzene	µg/kg	-	53 U	50 U	120 U	66 U	190 U
Methyl acetate	µg/kg	-	260 U	250 U	720	330 U	960 U
Methyl cyclohexane	µg/kg	-	53 U	50 U	120 U	66 U	190 U
Methyl tert butyl ether (MTBE)	µg/kg	-	53 U	50 U	120 U	66 U	190 U
Methylene chloride	µg/kg	-	53 U	50 U	120 U	66 U	190 U
Styrene	µg/kg	-	53 U	50 U	120 U	66 U	190 U
Tetrachloroethene	µg/kg	-	53 U	50 U	120 U	66 U	190 U
Toluene	µg/kg	-	53 U	50 U	120 U	66 U	190 U
trans-1,2-Dichloroethene	µg/kg	-	53 U	50 U	50 J	66 U	190 U
trans-1,3-Dichloropropene	µg/kg	-	53 U	50 U	120 U	66 U	190 U
Trichloroethene	µg/kg	-	150	970	3300	2200	7300
Trichlorofluoromethane (CFC-11)	µg/kg	-	53 U	50 U	120 U	66 U	190 U
Trifluorotrichloroethane (CFC-113)	µg/kg	-	53 U	50 U	120 U	66 U	190 U
Vinyl chloride	µg/kg	-	53 U	50 U	120 U	66 U	190 U
Xylenes (total)	µg/kg	-	110 U	100 U	240 U	130 U	380 U
General Chemistry							
Fraction organic carbon (FOC)	%	0.4	-	-	-	-	-

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit
UJ - Not detected; associated reporting limit is estimated
R - Rejected
ft. bgs - Feet Below Ground Surface
- = Not applicable

Table 2B

Analytical Results Summary
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Location ID:		GP-57	GP-57	GP-57	GP-57	GP-57	GP-58
Sample Name:		S-11219347-110920-AMC-017	S-11219347-110920-AMC-018	S-11219347-110920-AMC-019	S-11219347-110920-AMC-020	S-11219347-110920-AMC-021	S-11219347-112420-AMC-200
Sample Date:		11/09/2020	11/09/2020	11/09/2020	11/09/2020	11/09/2020	11/24/2020
Depth:		2-4 ft. bgs	4-6 ft. bgs	6-8 ft. bgs	8-10 ft. bgs	10-11.5 ft. bgs	6-8 ft. bgs
Parameters	Unit						
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/kg	1.8 J	69	91	6.0 U	4.2 U	4.4 U
1,1,2,2-Tetrachloroethane	µg/kg	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U
1,1,2-Trichloroethane	µg/kg	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U
1,1-Dichloroethane	µg/kg	5.1 U	60 U	68 U	1.4 J	4.2 U	4.4 U
1,1-Dichloroethene	µg/kg	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U
1,2,4-Trichlorobenzene	µg/kg	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U
1,2-Dichlorobenzene	µg/kg	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U
1,2-Dichloroethane	µg/kg	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U
1,2-Dichloropropane	µg/kg	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U
1,3-Dichlorobenzene	µg/kg	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U
1,4-Dichlorobenzene	µg/kg	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	26 U	300 U	340 U	20 J	21 U	22 U
2-Hexanone	µg/kg	26 U	300 U	340 U	30 U	21 U	22 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	26 U	300 U	340 U	30 U	21 U	22 U
Acetone	µg/kg	26 U	300 U	340 U	85	15 J	11 J
Benzene	µg/kg	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U
Bromodichloromethane	µg/kg	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U
Bromoform	µg/kg	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U
Bromomethane (Methyl bromide)	µg/kg	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U
Carbon disulfide	µg/kg	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U
Carbon tetrachloride	µg/kg	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U
Chlorobenzene	µg/kg	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U
Chloroethane	µg/kg	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U
Chloroform (Trichloromethane)	µg/kg	0.84 J	60 U	68 U	6.0 U	4.2 U	4.4 U
Chloromethane (Methyl chloride)	µg/kg	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U
cis-1,2-Dichloroethene	µg/kg	5.1 U	60 U	68 U	2.5 J	0.91 J	4.4 U
cis-1,3-Dichloropropene	µg/kg	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U
Cyclohexane	µg/kg	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U
Dibromochloromethane	µg/kg	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U
Dichlorodifluoromethane (CFC-12)	µg/kg	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U
Ethylbenzene	µg/kg	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U
Isopropyl benzene	µg/kg	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U
Methyl acetate	µg/kg	26 U	300 U	340 U	30 U	21 U	22 U
Methyl cyclohexane	µg/kg	5.1 U	55 J	68 U	6.0 U	4.2 U	4.4 U
Methyl tert butyl ether (MTBE)	µg/kg	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U
Methylene chloride	µg/kg	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U
Styrene	µg/kg	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U
Tetrachloroethene	µg/kg	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U
Toluene	µg/kg	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U
trans-1,2-Dichloroethene	µg/kg	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U
trans-1,3-Dichloropropene	µg/kg	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U
Trichloroethene	µg/kg	17	1700	1600	1.4 J	3.7 J	4.4 U
Trichlorofluoromethane (CFC-11)	µg/kg	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U
Trifluorotrichloroethane (CFC-113)	µg/kg	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U
Vinyl chloride	µg/kg	5.1 U	60 U	68 U	6.0 U	4.2 U	4.4 U
Xylenes (total)	µg/kg	10 U	120 U	140 U	12 U	8.5 U	8.9 U
General Chemistry							
Fraction organic carbon (FOC)	%	-	-	-	-	-	-

Notes:

- J - Estimated concentration
- U - Not detected at the associated reporting limit
- UJ - Not detected; associated reporting limit is estimated
- R - Rejected
- ft. bgs - Feet Below Ground Surface
- = Not applicable

Table 2B

Analytical Results Summary
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Location ID:		GP-58	GP-58	GP-59	GP-59	GP-59	GP-60
Sample Name:		S-11219347-112420-AMC-201	S-11219347-112420-AMC-202	S-11219347-110920-AMC-001	S-11219347-110920-AMC-002	S-11219347-110920-AMC-003	S-11219347-110920-AMC-004
Sample Date:		11/24/2020	11/24/2020	11/09/2020	11/09/2020	11/09/2020	11/09/2020
Depth:		8-10 ft. bgs	10-11.6 ft. bgs	3-4 ft. bgs	4-4.9 ft. bgs	0-2 ft. bgs	2-4 ft. bgs
Parameters	Unit						
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/kg	3.8 U	4.1 U	4.2 U	3.8 U	-	0.65 J
1,1,2,2-Tetrachloroethane	µg/kg	3.8 U	4.1 U	4.2 U	3.8 U	-	4.3 U
1,1,2-Trichloroethane	µg/kg	3.8 U	4.1 U	4.2 U	3.8 U	-	4.3 U
1,1-Dichloroethane	µg/kg	3.8 U	4.1 U	4.2 U	3.8 U	-	4.3 U
1,1-Dichloroethene	µg/kg	3.8 U	4.1 U	4.2 U	3.8 U	-	4.3 U
1,2,4-Trichlorobenzene	µg/kg	3.8 U	4.1 U	4.2 U	3.8 U	-	4.3 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	3.8 U	4.1 U	4.2 U	3.8 U	-	4.3 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	3.8 U	4.1 U	4.2 U	3.8 U	-	4.3 U
1,2-Dichlorobenzene	µg/kg	3.8 U	4.1 U	4.2 U	3.8 U	-	4.3 U
1,2-Dichloroethane	µg/kg	3.8 U	4.1 U	4.2 U	3.8 U	-	4.3 U
1,2-Dichloropropane	µg/kg	3.8 U	4.1 U	4.2 U	3.8 U	-	4.3 U
1,3-Dichlorobenzene	µg/kg	3.8 U	4.1 U	4.2 U	3.8 U	-	4.3 U
1,4-Dichlorobenzene	µg/kg	3.8 U	4.1 U	4.2 U	3.8 U	-	4.3 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	2.4 J	21 U	21 U	19 U	-	22 U
2-Hexanone	µg/kg	19 U	21 U	21 U	19 U	-	22 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	19 U	21 U	21 U	19 U	-	22 U
Acetone	µg/kg	12 J	6.2 J	21 U	19 U	-	22 U
Benzene	µg/kg	3.8 U	4.1 U	4.2 U	3.8 U	-	4.3 U
Bromodichloromethane	µg/kg	3.8 U	4.1 U	4.2 U	3.8 U	-	4.3 U
Bromoform	µg/kg	3.8 U	4.1 U	4.2 U	3.8 U	-	4.3 U
Bromomethane (Methyl bromide)	µg/kg	3.8 U	4.1 U	4.2 U	3.8 U	-	4.3 U
Carbon disulfide	µg/kg	3.8 U	4.1 U	4.2 U	3.8 U	-	4.3 U
Carbon tetrachloride	µg/kg	3.8 U	4.1 U	4.2 U	3.8 U	-	4.3 U
Chlorobenzene	µg/kg	3.8 U	4.1 U	4.2 U	3.8 U	-	4.3 U
Chloroethane	µg/kg	3.8 U	4.1 U	4.2 U	3.8 U	-	4.3 U
Chloroform (Trichloromethane)	µg/kg	3.8 U	4.1 U	4.2 U	3.8 U	-	4.3 U
Chloromethane (Methyl chloride)	µg/kg	3.8 U	4.1 U	4.2 U	3.8 U	-	4.3 U
cis-1,2-Dichloroethene	µg/kg	3.8 U	4.1 U	4.2 U	3.8 U	-	4.3 U
cis-1,3-Dichloropropene	µg/kg	3.8 U	4.1 U	4.2 U	3.8 U	-	4.3 U
Cyclohexane	µg/kg	3.8 U	4.1 U	4.2 U	3.8 U	-	4.3 U
Dibromochloromethane	µg/kg	3.8 U	4.1 U	4.2 U	3.8 U	-	4.3 U
Dichlorodifluoromethane (CFC-12)	µg/kg	3.8 U	4.1 U	4.2 U	3.8 U	-	4.3 U
Ethylbenzene	µg/kg	3.8 U	4.1 U	4.2 U	3.8 U	-	4.3 U
Isopropyl benzene	µg/kg	3.8 U	4.1 U	4.2 U	3.8 U	-	4.3 U
Methyl acetate	µg/kg	19 U	21 U	21 U	19 U	-	22 U
Methyl cyclohexane	µg/kg	1.2 J	4.1 U	4.2 U	3.8 U	-	4.3 U
Methyl tert butyl ether (MTBE)	µg/kg	3.8 U	4.1 U	4.2 U	3.8 U	-	4.3 U
Methylene chloride	µg/kg	3.8 U	4.1 U	4.2 U	3.8 U	-	4.3 U
Styrene	µg/kg	3.8 U	4.1 U	4.2 U	3.8 U	-	4.3 U
Tetrachloroethene	µg/kg	3.8 U	4.1 U	4.2 U	3.8 U	-	4.3 U
Toluene	µg/kg	3.8 U	4.1 U	4.2 U	3.8 U	-	4.3 U
trans-1,2-Dichloroethene	µg/kg	3.8 U	4.1 U	4.2 U	3.8 U	-	4.3 U
trans-1,3-Dichloropropene	µg/kg	3.8 U	4.1 U	4.2 U	3.8 U	-	4.3 U
Trichloroethene	µg/kg	0.97 J	1.2 J	4.2 U	3.8 U	-	6.3
Trichlorofluoromethane (CFC-11)	µg/kg	3.8 U	4.1 U	4.2 U	3.8 U	-	4.3 U
Trifluorotrichloroethane (CFC-113)	µg/kg	3.8 U	4.1 U	4.2 U	3.8 U	-	4.3 U
Vinyl chloride	µg/kg	3.8 U	4.1 U	4.2 U	3.8 U	-	4.3 U
Xylenes (total)	µg/kg	7.7 U	8.3 U	8.3 U	7.7 U	-	8.6 U
General Chemistry							
Fraction organic carbon (FOC)	%	-	-	-	-	1.8	-

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit
UJ - Not detected; associated reporting limit is estimated
R - Rejected
ft. bgs - Feet Below Ground Surface
- = Not applicable

Table 2B

Analytical Results Summary
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Location ID:		GP-60	GP-61	GP-61	GP-61	GP-62	GP-62
Sample Name:		S-11219347-110920-AMC-005	S-11219347-110920-AMC-006	S-11219347-110920-AMC-007	S-11219347-110920-AMC-008	S-11219347-110920-AMC-010	S-11219347-110920-AMC-011
Sample Date:		11/09/2020	11/09/2020	11/09/2020	11/09/2020	11/09/2020	11/09/2020
Depth:		4-4.9 ft. bgs	2-4 ft. bgs	4-6 ft. bgs	6-6.5 ft. bgs	4-6 ft. bgs	6-8 ft. bgs
Parameters	Unit						
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/kg	4.2 U	110 U	70	95	110 U	66 U
1,1,2,2-Tetrachloroethane	µg/kg	4.2 U	110 U	60 U	60 U	110 U	66 U
1,1,2-Trichloroethane	µg/kg	4.2 U	110 U	60 U	60 U	110 U	66 U
1,1-Dichloroethane	µg/kg	4.2 U	97 J	170	21 J	110 U	97
1,1-Dichloroethene	µg/kg	4.2 U	110 U	35 J	60 U	110 U	66 U
1,2,4-Trichlorobenzene	µg/kg	4.2 U	110 U	60 U	60 U	110 U	66 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	4.2 U	110 U	60 U	60 U	110 U	66 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	4.2 U	110 U	60 U	60 U	110 U	66 U
1,2-Dichlorobenzene	µg/kg	4.2 U	110 U	60 U	60 U	110 U	66 U
1,2-Dichloroethane	µg/kg	4.2 U	110 U	60 U	60 U	110 U	66 U
1,2-Dichloropropane	µg/kg	4.2 U	110 U	60 U	60 U	110 U	66 U
1,3-Dichlorobenzene	µg/kg	4.2 U	110 U	60 U	60 U	110 U	66 U
1,4-Dichlorobenzene	µg/kg	4.2 U	110 U	60 U	60 U	110 U	66 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	21 U	570 U	300 U	300 U	550 U	330 U
2-Hexanone	µg/kg	21 U	570 U	300 U	300 U	550 U	330 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	21 U	570 U	300 U	300 U	550 U	330 U
Acetone	µg/kg	21 U	570 U	300 U	300 U	550 U	330 U
Benzene	µg/kg	4.2 U	110 U	60 U	60 U	110 U	66 U
Bromodichloromethane	µg/kg	4.2 U	110 U	60 U	60 U	110 U	66 U
Bromoform	µg/kg	4.2 U	110 U	60 U	60 U	110 U	66 U
Bromomethane (Methyl bromide)	µg/kg	4.2 U	110 U	60 U	60 U	110 U	66 U
Carbon disulfide	µg/kg	4.2 U	110 U	60 U	60 U	110 U	66 U
Carbon tetrachloride	µg/kg	4.2 U	110 U	60 U	60 U	110 U	66 U
Chlorobenzene	µg/kg	4.2 U	110 U	60 U	60 U	110 U	66 U
Chloroethane	µg/kg	4.2 U	110 U	60 U	60 U	110 U	66 U
Chloroform (Trichloromethane)	µg/kg	4.2 U	110 U	60 U	60 U	110 U	66 U
Chloromethane (Methyl chloride)	µg/kg	4.2 U	110 U	60 U	60 U	110 U	66 U
cis-1,2-Dichloroethene	µg/kg	1.3 J	1200	1200	93	390	210
cis-1,3-Dichloropropene	µg/kg	4.2 U	110 U	60 U	60 U	110 U	66 U
Cyclohexane	µg/kg	4.2 U	110 U	60 U	60 U	110 U	66 U
Dibromochloromethane	µg/kg	4.2 U	110 U	60 U	60 U	110 U	66 U
Dichlorodifluoromethane (CFC-12)	µg/kg	4.2 U	110 U	60 U	60 U	110 U	66 U
Ethylbenzene	µg/kg	4.2 U	110 U	60 U	60 U	110 U	66 U
Isopropyl benzene	µg/kg	4.2 U	110 U	60 U	60 U	110 U	66 U
Methyl acetate	µg/kg	21 U	570 U	300 U	300 U	550 U	110 J
Methyl cyclohexane	µg/kg	4.2 U	110 U	60 U	60 U	110 U	66 U
Methyl tert butyl ether (MTBE)	µg/kg	4.2 U	110 U	60 U	60 U	110 U	66 U
Methylene chloride	µg/kg	4.2 U	110 U	60 U	60 U	110 U	66 U
Styrene	µg/kg	4.2 U	110 U	60 U	60 U	110 U	66 U
Tetrachloroethene	µg/kg	4.2 U	110 U	60 U	60 U	110 U	66 U
Toluene	µg/kg	4.2 U	110 U	60 U	60 U	110 U	66 U
trans-1,2-Dichloroethene	µg/kg	4.2 U	110 U	24 J	60 U	64 J	66 U
trans-1,3-Dichloropropene	µg/kg	4.2 U	110 U	60 U	60 U	110 U	66 U
Trichloroethene	µg/kg	5.9	200	670	360	1400	470
Trichlorofluoromethane (CFC-11)	µg/kg	4.2 U	110 U	60 U	60 U	110 U	66 U
Trifluorotrichloroethane (CFC-113)	µg/kg	4.2 U	110 U	60 U	60 U	110 U	66 U
Vinyl chloride	µg/kg	4.2 U	110 U	60 U	60 U	110 U	66 U
Xylenes (total)	µg/kg	8.3 U	230 U	120 U	120 U	220 U	130 U
General Chemistry							
Fraction organic carbon (FOC)	%	-	-	-	-	-	-

Notes:

- J - Estimated concentration
- U - Not detected at the associated reporting limit
- UJ - Not detected; associated reporting limit is estimated
- R - Rejected
- ft. bgs - Feet Below Ground Surface
- = Not applicable

Table 2B

Analytical Results Summary
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Location ID:		GP-62	GP-63	GP-63	GP-63	GP-64	GP-64
Sample Name:		S-11219347-110920-AMC-012	S-11219347-110920-AMC-013	S-11219347-110920-AMC-014	S-11219347-110920-AMC-015	S-11219347-112420-AMC-198	S-11219347-112420-AMC-199
Sample Date:		11/09/2020	11/09/2020	11/09/2020	11/09/2020	11/24/2020	11/24/2020
Depth:		8-9.7 ft. bgs	6.5-8 ft. bgs	8-10 ft. bgs	10-11 ft. bgs	8-10 ft. bgs	10-11.8 ft. bgs
Parameters	Unit						
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/kg	98	4.3 U	4.2 U	1.1 J	4.1 U	0.58 J
1,1,2,2-Tetrachloroethane	µg/kg	60 U	4.3 U	4.2 U	4.4 U	4.1 U	3.9 U
1,1,2-Trichloroethane	µg/kg	60 U	4.3 U	4.2 U	4.4 U	4.1 U	3.9 U
1,1-Dichloroethane	µg/kg	60 U	4.3 U	1.4 J	4.4 U	0.90 J	3.9 U
1,1-Dichloroethene	µg/kg	85	4.3 U	4.2 U	4.4 U	4.1 U	3.9 U
1,2,4-Trichlorobenzene	µg/kg	60 U	4.3 U	4.2 U	4.4 U	4.1 U	3.9 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	60 U	4.3 U	4.2 U	4.4 U	4.1 U	3.9 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	60 U	4.3 U	4.2 U	4.4 U	4.1 U	3.9 U
1,2-Dichlorobenzene	µg/kg	60 U	4.3 U	4.2 U	4.4 U	4.1 U	3.9 U
1,2-Dichloroethane	µg/kg	60 U	4.3 U	4.2 U	4.4 U	4.1 U	3.9 U
1,2-Dichloropropane	µg/kg	60 U	4.3 U	4.2 U	4.4 U	4.1 U	3.9 U
1,3-Dichlorobenzene	µg/kg	60 U	4.3 U	4.2 U	4.4 U	4.1 U	3.9 U
1,4-Dichlorobenzene	µg/kg	60 U	4.3 U	4.2 U	4.4 U	4.1 U	3.9 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	300 U	22 U	21 U	22 U	20 U	19 U
2-Hexanone	µg/kg	300 U	22 U	21 U	22 U	20 U	19 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	300 U	22 U	21 U	22 U	20 U	19 U
Acetone	µg/kg	300 U	17 J	11 J	22 U	20 U	19 U
Benzene	µg/kg	60 U	4.3 U	4.2 U	4.4 U	4.1 U	3.9 U
Bromodichloromethane	µg/kg	60 U	4.3 U	4.2 U	4.4 U	4.1 U	3.9 U
Bromoform	µg/kg	60 U	4.3 U	4.2 U	4.4 U	4.1 U	3.9 U
Bromomethane (Methyl bromide)	µg/kg	60 U	4.3 U	4.2 U	4.4 U	4.1 U	3.9 U
Carbon disulfide	µg/kg	60 U	4.3 U	4.2 U	4.4 U	4.1 U	3.9 U
Carbon tetrachloride	µg/kg	60 U	4.3 U	4.2 U	4.4 U	4.1 U	3.9 U
Chlorobenzene	µg/kg	60 U	4.3 U	4.2 U	4.4 U	4.1 U	3.9 U
Chloroethane	µg/kg	60 U	4.3 U	4.2 U	4.4 U	4.1 U	3.9 U
Chloroform (Trichloromethane)	µg/kg	60 U	4.3 U	4.2 U	4.4 U	4.1 U	3.9 U
Chloromethane (Methyl chloride)	µg/kg	60 U	4.3 U	4.2 U	4.4 U	4.1 U	3.9 U
cis-1,2-Dichloroethene	µg/kg	270	1.3 J	3.6 J	1.9 J	1.9 J	1.4 J
cis-1,3-Dichloropropene	µg/kg	60 U	4.3 U	4.2 U	4.4 U	4.1 U	3.9 U
Cyclohexane	µg/kg	60 U	4.3 U	4.2 U	4.4 U	4.1 U	3.9 U
Dibromochloromethane	µg/kg	60 U	4.3 U	4.2 U	4.4 U	4.1 U	3.9 U
Dichlorodifluoromethane (CFC-12)	µg/kg	60 U	4.3 U	4.2 U	4.4 U	4.1 U	3.9 U
Ethylbenzene	µg/kg	60 U	4.3 U	4.2 U	4.4 U	4.1 U	3.9 U
Isopropyl benzene	µg/kg	60 U	4.3 U	4.2 U	4.4 U	4.1 U	3.9 U
Methyl acetate	µg/kg	1500	22 U	21 U	22 U	20 U	19 U
Methyl cyclohexane	µg/kg	60 U	4.3 U	4.2 U	4.4 U	4.1 U	3.9 U
Methyl tert butyl ether (MTBE)	µg/kg	60 U	4.3 U	4.2 U	4.4 U	4.1 U	3.9 U
Methylene chloride	µg/kg	60 U	4.3 U	4.2 U	4.4 U	4.1 U	3.9 U
Styrene	µg/kg	60 U	4.3 U	4.2 U	4.4 U	4.1 U	3.9 U
Tetrachloroethene	µg/kg	60 U	4.3 U	4.2 U	4.4 U	4.1 U	3.9 U
Toluene	µg/kg	60 U	4.3 U	4.2 U	4.4 U	4.1 U	3.9 U
trans-1,2-Dichloroethene	µg/kg	22 J	4.3 U	4.2 U	4.4 U	4.1 U	3.9 U
trans-1,3-Dichloropropene	µg/kg	60 U	4.3 U	4.2 U	4.4 U	4.1 U	3.9 U
Trichloroethene	µg/kg	1100	1.1 J	2.7 J	30	3.3 J	5.9
Trichlorofluoromethane (CFC-11)	µg/kg	160	4.3 U	4.2 U	4.4 U	4.1 U	3.9 U
Trifluorotrichloroethane (CFC-113)	µg/kg	60 U	4.3 U	4.2 U	4.4 U	4.1 U	3.9 U
Vinyl chloride	µg/kg	60 U	4.3 U	1.1 J	4.4 U	4.1 U	3.9 U
Xylenes (total)	µg/kg	120 U	8.7 U	8.4 U	8.8 U	8.2 U	7.7 U
General Chemistry							
Fraction organic carbon (FOC)	%	-	-	-	-	-	-

Notes:

- J - Estimated concentration
- U - Not detected at the associated reporting limit
- UJ - Not detected; associated reporting limit is estimated
- R - Rejected
- ft. bgs - Feet Below Ground Surface
- = Not applicable

Table 2B

Analytical Results Summary
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Location ID:		GP-67	GP-67	GP-67	GP-68	GP-68	GP-68
Sample Name:		S-11219347-111720-AMC-169	S-11219347-111720-AMC-170	S-11219347-111720-AMC-171	S-11219347-111720-AMC-172	S-11219347-111720-AMC-173	S-11219347-111720-AMC-174
Sample Date:		11/17/2020	11/17/2020	11/17/2020	11/17/2020	11/17/2020	11/17/2020
Depth:		2-4 ft. bgs	4-5.4 ft. bgs	4-5.4 ft. bgs	2-4 ft. bgs	4-6 ft. bgs	6-7.4 ft. bgs
Parameters	Unit						
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/kg	4.2 U	4.5 U	-	61 U	5.9 U	240
1,1,2,2-Tetrachloroethane	µg/kg	4.2 U	4.5 U	-	61 U	5.9 U	19 U
1,1,2-Trichloroethane	µg/kg	4.2 U	4.5 U	-	61 U	5.9 U	19 U
1,1-Dichloroethane	µg/kg	4.2 U	1.6 J	-	61 U	3.0 J	17 J
1,1-Dichloroethene	µg/kg	4.2 U	4.5 U	-	61 U	5.9 U	81
1,2,4-Trichlorobenzene	µg/kg	4.2 U	4.5 U	-	61 U	5.9 U	19 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	4.2 U	4.5 U	-	61 U	5.9 U	19 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	4.2 U	4.5 U	-	61 U	5.9 U	19 U
1,2-Dichlorobenzene	µg/kg	4.2 U	4.5 U	-	61 U	5.9 U	19 U
1,2-Dichloroethane	µg/kg	4.2 U	4.5 U	-	61 U	5.9 U	19 U
1,2-Dichloropropane	µg/kg	4.2 U	4.5 U	-	61 U	5.9 U	19 U
1,3-Dichlorobenzene	µg/kg	4.2 U	4.5 U	-	61 U	5.9 U	19 U
1,4-Dichlorobenzene	µg/kg	4.2 U	4.5 U	-	61 U	5.9 U	19 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	4.2 J	22 U	-	310 U	17 J	96 U
2-Hexanone	µg/kg	21 U	22 U	-	310 U	29 U	96 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	21 U	22 U	-	310 U	29 U	96 U
Acetone	µg/kg	22	17 J	-	310 U	67	96 U
Benzene	µg/kg	4.2 U	4.5 U	-	61 U	5.9 U	19 U
Bromodichloromethane	µg/kg	4.2 U	4.5 U	-	61 U	5.9 U	19 U
Bromoform	µg/kg	4.2 U	4.5 U	-	61 U	5.9 U	19 U
Bromomethane (Methyl bromide)	µg/kg	4.2 U	4.5 U	-	61 U	5.9 U	19 U
Carbon disulfide	µg/kg	4.2 U	4.5 U	-	61 U	5.9 U	19 U
Carbon tetrachloride	µg/kg	4.2 U	4.5 U	-	61 U	5.9 U	19 U
Chlorobenzene	µg/kg	4.2 U	4.5 U	-	61 U	5.9 U	19 U
Chloroethane	µg/kg	4.2 U	4.5 U	-	61 U	5.9 U	19 U
Chloroform (Trichloromethane)	µg/kg	4.2 U	4.5 U	-	61 U	5.9 U	19 U
Chloromethane (Methyl chloride)	µg/kg	4.2 U	4.5 U	-	61 U	5.9 U	19 U
cis-1,2-Dichloroethene	µg/kg	0.84 J	0.99 J	-	150	1.3 J	110
cis-1,3-Dichloropropene	µg/kg	4.2 U	4.5 U	-	61 U	5.9 U	19 U
Cyclohexane	µg/kg	4.2 U	4.5 U	-	61 U	5.9 U	19 U
Dibromochloromethane	µg/kg	4.2 U	4.5 U	-	61 U	5.9 U	19 U
Dichlorodifluoromethane (CFC-12)	µg/kg	4.2 U	4.5 U	-	61 U	5.9 U	19 U
Ethylbenzene	µg/kg	4.2 U	4.5 U	-	61 U	5.9 U	19 U
Isopropyl benzene	µg/kg	4.2 U	4.5 U	-	61 U	5.9 U	19 U
Methyl acetate	µg/kg	21 U	22 U	-	310 U	29 U	180
Methyl cyclohexane	µg/kg	4.2 U	4.5 U	-	61 U	5.9 U	19 U
Methyl tert butyl ether (MTBE)	µg/kg	4.2 U	4.5 U	-	61 U	5.9 U	19 U
Methylene chloride	µg/kg	4.2 U	4.5 U	-	61 U	5.9 U	19 U
Styrene	µg/kg	4.2 U	4.5 U	-	61 U	5.9 U	19 U
Tetrachloroethene	µg/kg	4.2 U	4.5 U	-	61 U	5.9 U	19 U
Toluene	µg/kg	4.2 U	4.5 U	-	61 U	5.9 U	19 U
trans-1,2-Dichloroethene	µg/kg	4.2 U	4.5 U	-	61 U	5.9 U	19 U
trans-1,3-Dichloropropene	µg/kg	4.2 U	4.5 U	-	61 U	5.9 U	19 U
Trichloroethene	µg/kg	4.2 U	4.5 U	-	890	5.9 U	610
Trichlorofluoromethane (CFC-11)	µg/kg	4.2 U	4.5 U	-	61 U	5.9 U	19 U
Trifluorotrichloroethane (CFC-113)	µg/kg	4.2 U	4.5 U	-	61 U	5.9 U	19 U
Vinyl chloride	µg/kg	4.2 U	4.5 U	-	61 U	5.9 U	19 U
Xylenes (total)	µg/kg	8.4 U	8.9 U	-	120 U	12 U	38 U
General Chemistry							
Fraction organic carbon (FOC)	%	-	-	1.3	-	-	-

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit
UJ - Not detected; associated reporting limit is estimated
R - Rejected
ft. bgs - Feet Below Ground Surface
- = Not applicable

Table 2B

Analytical Results Summary
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Location ID:		GP-69	GP-7-1	GP-7-1	GP-7-1	GP-8-1	GP-8-1
Sample Name:		S-11219347-111820-AMC-179	S-11219347-111220-AMC-093	S-11219347-111220-AMC-094	S-11219347-111220-AMC-095	S-11219347-111320-AMC-119	S-11219347-111320-AMC-120
Sample Date:		11/18/2020	11/12/2020	11/12/2020	11/12/2020	11/13/2020	11/13/2020
Depth:		8-9.8 ft. bgs	8-10 ft. bgs	8-10 ft. bgs	10-11.9 ft. bgs	9.5-11 ft. bgs	9.5-11 ft. bgs
Parameters	Unit			Duplicate			
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/kg	3.5 U	140	140	690	130	150
1,1,2,2-Tetrachloroethane	µg/kg	3.5 UJ	100 U	110 U	210 U	51 U	56 U
1,1,2-Trichloroethane	µg/kg	3.5 UJ	100 U	110 U	210 U	51 U	56 U
1,1-Dichloroethane	µg/kg	0.81 J	100 U	110 U	210 U	51 U	56 U
1,1-Dichloroethene	µg/kg	3.5 U	48 J	48 J	120 J	51 U	56 U
1,2,4-Trichlorobenzene	µg/kg	3.5 U	100 U	110 U	210 U	51 U	56 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	3.5 UJ	100 U	110 U	210 U	51 U	56 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	3.5 UJ	100 U	110 U	210 U	51 U	56 U
1,2-Dichlorobenzene	µg/kg	3.5 U	100 U	110 U	210 U	51 U	56 U
1,2-Dichloroethane	µg/kg	3.5 U	100 U	110 U	210 U	51 U	56 U
1,2-Dichloropropane	µg/kg	3.5 U	100 U	110 U	210 U	51 U	56 U
1,3-Dichlorobenzene	µg/kg	3.5 U	100 U	110 U	210 U	51 U	56 U
1,4-Dichlorobenzene	µg/kg	3.5 U	100 U	110 U	210 U	51 U	56 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	18 UJ	510 U	540 U	1100 U	250 U	280 U
2-Hexanone	µg/kg	18 U	510 U	540 U	1100 U	250 U	280 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	18 UJ	510 U	540 U	1100 U	250 U	280 U
Acetone	µg/kg	18 U	510 U	540 U	1100 U	250 U	280 U
Benzene	µg/kg	3.5 U	100 U	110 U	210 U	51 U	56 U
Bromodichloromethane	µg/kg	3.5 U	100 U	110 U	210 U	51 U	56 U
Bromoform	µg/kg	3.5 U	100 U	110 U	210 U	51 U	56 U
Bromomethane (Methyl bromide)	µg/kg	3.5 U	100 U	110 U	210 U	51 U	56 U
Carbon disulfide	µg/kg	3.5 U	100 U	110 U	210 U	51 U	56 U
Carbon tetrachloride	µg/kg	3.5 U	100 U	110 U	210 U	51 U	56 U
Chlorobenzene	µg/kg	3.5 U	100 U	110 U	210 U	51 U	56 U
Chloroethane	µg/kg	3.5 U	100 U	110 U	210 U	51 U	56 U
Chloroform (Trichloromethane)	µg/kg	3.5 U	100 U	110 U	210 U	51 U	56 U
Chloromethane (Methyl chloride)	µg/kg	3.5 U	100 U	110 U	210 U	51 U	56 U
cis-1,2-Dichloroethene	µg/kg	2.3 J	100 U	110 U	210 U	51 U	56 U
cis-1,3-Dichloropropene	µg/kg	3.5 U	100 U	110 U	210 U	51 U	56 U
Cyclohexane	µg/kg	3.5 U	100 U	110 U	210 U	51 U	56 U
Dibromochloromethane	µg/kg	3.5 U	100 U	110 U	210 U	51 U	56 U
Dichlorodifluoromethane (CFC-12)	µg/kg	3.5 U	100 U	110 U	210 U	51 U	56 U
Ethylbenzene	µg/kg	3.5 U	100 U	110 U	210 U	51 U	56 U
Isopropyl benzene	µg/kg	3.5 U	100 U	110 U	210 U	51 U	56 U
Methyl acetate	µg/kg	18 U	510 U	540 U	1100 U	250 U	280 U
Methyl cyclohexane	µg/kg	3.5 U	100 U	110 U	210 U	51 U	56 U
Methyl tert butyl ether (MTBE)	µg/kg	3.5 U	100 U	110 U	210 U	51 U	56 U
Methylene chloride	µg/kg	3.5 U	100 U	110 U	210 U	51 U	56 U
Styrene	µg/kg	3.5 U	100 U	110 U	210 U	51 U	56 U
Tetrachloroethene	µg/kg	3.5 U	100 U	55 J	120 J	51 U	56 U
Toluene	µg/kg	3.5 U	100 U	110 U	210 U	51 U	56 U
trans-1,2-Dichloroethene	µg/kg	3.5 U	100 U	110 U	210 U	51 U	56 U
trans-1,3-Dichloropropene	µg/kg	3.5 U	100 U	110 U	210 U	51 U	56 U
Trichloroethene	µg/kg	4.9	3100	2900	10000	380	400
Trichlorofluoromethane (CFC-11)	µg/kg	3.5 U	100 U	110 U	210 U	51 U	56 U
Trifluorotrichloroethane (CFC-113)	µg/kg	3.5 U	100 U	110 U	210 U	51 U	56 U
Vinyl chloride	µg/kg	3.5 U	100 U	110 U	210 U	51 U	56 U
Xylenes (total)	µg/kg	7.1 U	210 U	210 U	430 U	100 U	110 U
General Chemistry							
Fraction organic carbon (FOC)	%	-	-	-	-	-	-

Notes:

- J - Estimated concentration
- U - Not detected at the associated reporting limit
- UJ - Not detected; associated reporting limit is estimated
- R - Rejected
- ft. bgs - Feet Below Ground Surface
- = Not applicable

Table 2B

Analytical Results Summary
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Location ID:		GP-8-1	GP-8-1	GP-8-1	GP-C-1	GP-C-1	GP-C-1
Sample Name:		S-11219347-111320-AMC-121	S-11219347-111320-AMC-122	S-11219347-111320-AMC-123	S-11219347-111620-AMC-140	S-11219347-111620-AMC-141	S-11219347-111620-AMC-142
Sample Date:		11/13/2020	11/13/2020	11/13/2020	11/16/2020	11/16/2020	11/16/2020
Depth:		11-13 ft. bgs	13-15 ft. bgs	15-16.1 ft. bgs	6-8 ft. bgs	8-10 ft. bgs	10-12 ft. bgs
Parameters	Unit						
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/kg	250	1100	1100	7600	7900000	770000
1,1,2,2-Tetrachloroethane	µg/kg	51 U	51 U	55 U	200 U	250000 U	25000 U
1,1,2-Trichloroethane	µg/kg	51 U	51 U	55 U	200 U	250000 U	25000 U
1,1-Dichloroethane	µg/kg	51 U	46 J	61	120 J	250000 U	25000 U
1,1-Dichloroethene	µg/kg	24 J	150	290	580	190000 J	98000
1,2,4-Trichlorobenzene	µg/kg	51 U	51 U	55 U	200 U	250000 U	25000 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	51 U	51 U	55 U	200 U	250000 U	25000 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	51 U	51 U	55 U	200 U	250000 U	25000 U
1,2-Dichlorobenzene	µg/kg	51 U	51 U	55 U	200 U	250000 U	25000 U
1,2-Dichloroethane	µg/kg	51 U	51 U	55 U	200 U	250000 U	25000 U
1,2-Dichloropropane	µg/kg	51 U	51 U	55 U	200 U	250000 U	25000 U
1,3-Dichlorobenzene	µg/kg	51 U	51 U	55 U	200 U	250000 U	25000 U
1,4-Dichlorobenzene	µg/kg	51 U	51 U	55 U	200 U	250000 U	25000 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	260 U	260 U	280 U	1000 U	1200000 U	120000 U
2-Hexanone	µg/kg	260 U	260 U	280 U	1000 U	1200000 U	120000 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	260 U	260 U	280 U	1000 U	1200000 U	120000 U
Acetone	µg/kg	260 U	260 U	280 U	1000 U	1200000 U	120000 U
Benzene	µg/kg	51 U	51 U	55 U	200 U	250000 U	25000 U
Bromodichloromethane	µg/kg	51 U	51 U	55 U	200 U	250000 U	25000 U
Bromoform	µg/kg	51 U	51 U	55 U	200 U	250000 U	25000 U
Bromomethane (Methyl bromide)	µg/kg	51 U	51 U	55 U	200 U	250000 U	25000 U
Carbon disulfide	µg/kg	51 U	51 U	55 U	200 U	250000 U	25000 U
Carbon tetrachloride	µg/kg	51 U	51 U	55 U	200 U	250000 U	25000 U
Chlorobenzene	µg/kg	51 U	51 U	55 U	200 U	250000 U	25000 U
Chloroethane	µg/kg	51 U	51 U	55 U	200 U	250000 U	25000 U
Chloroform (Trichloromethane)	µg/kg	51 U	51 U	55 U	200 U	250000 U	25000 U
Chloromethane (Methyl chloride)	µg/kg	51 U	51 U	55 U	200 U	250000 U	25000 U
cis-1,2-Dichloroethene	µg/kg	51 U	160	220	220	250000 U	25000 U
cis-1,3-Dichloropropene	µg/kg	51 U	51 U	55 U	200 U	250000 U	25000 U
Cyclohexane	µg/kg	51 U	51 U	55 U	200 U	250000 U	25000 U
Dibromochloromethane	µg/kg	51 U	51 U	55 U	200 U	250000 U	25000 U
Dichlorodifluoromethane (CFC-12)	µg/kg	51 U	51 U	55 U	200 U	250000 U	25000 U
Ethylbenzene	µg/kg	51 U	51 U	55 U	200 U	250000 U	25000 U
Isopropyl benzene	µg/kg	51 U	51 U	55 U	200 U	250000 U	25000 U
Methyl acetate	µg/kg	260 U	260 U	280 U	1000 U	1200000 U	120000 U
Methyl cyclohexane	µg/kg	51 U	51 U	55 U	200 U	250000 U	25000 U
Methyl tert butyl ether (MTBE)	µg/kg	51 U	51 U	55 U	200 U	250000 U	25000 U
Methylene chloride	µg/kg	51 U	51 U	55 U	200 U	250000 U	25000 U
Styrene	µg/kg	51 U	51 U	55 U	200 U	250000 U	25000 U
Tetrachloroethene	µg/kg	51 U	51 U	55 U	200 U	250000 U	25000 U
Toluene	µg/kg	51 U	51 U	55 U	200 U	250000 U	25000 U
trans-1,2-Dichloroethene	µg/kg	51 U	51 U	55 U	200 U	250000 U	25000 U
trans-1,3-Dichloropropene	µg/kg	51 U	51 U	55 U	200 U	250000 U	25000 U
Trichloroethene	µg/kg	890	4300	4700	5900	2700000	1300000
Trichlorofluoromethane (CFC-11)	µg/kg	51 U	51 U	55 U	200 U	250000 U	25000 U
Trifluorotrichloroethane (CFC-113)	µg/kg	51 U	51 U	55 U	200 U	250000 U	25000 U
Vinyl chloride	µg/kg	51 U	51 U	55 U	200 U	250000 U	25000 U
Xylenes (total)	µg/kg	100 U	100 U	110 U	410 U	500000 U	50000 U
General Chemistry							
Fraction organic carbon (FOC)	%	-	-	-	-	-	-

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit
UJ - Not detected; associated reporting limit is estimated
R - Rejected
ft. bgs - Feet Below Ground Surface
- = Not applicable

Table 2B

Analytical Results Summary
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Location ID:		GP-C-1	GP-C-1	GP-C-1	MW-106	MW-106	MW-106
Sample Name:		S-11219347-111620-AMC-143	S-11219347-111620-AMC-144	S-11219347-111620-AMC-145	S-11219347-112020-AMC-189	S-11219347-112020-AMC-190	S-11219347-112020-AMC-191
Sample Date:		11/16/2020	11/16/2020	11/16/2020	11/20/2020	11/20/2020	11/20/2020
Depth:		12-14 ft. bgs	14-15.7 ft. bgs	14.8-15.6 ft. bgs	0.5-2 ft. bgs	2-4 ft. bgs	4-6 ft. bgs
Parameters	Unit						
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/kg	140000	5300	-	0.62 J	1.2 J	47 J
1,1,2,2-Tetrachloroethane	µg/kg	19000 U	1400 U	-	5.1 U	4.5 U	91 U
1,1,2-Trichloroethane	µg/kg	19000 U	1400 U	-	5.1 U	4.5 U	91 U
1,1-Dichloroethane	µg/kg	19000 U	1400 U	-	5.1 U	4.5 U	91 U
1,1-Dichloroethene	µg/kg	47000	3800	-	5.1 U	4.5 U	91 U
1,2,4-Trichlorobenzene	µg/kg	19000 U	1400 U	-	5.1 U	4.5 U	91 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	19000 U	1400 U	-	5.1 U	4.5 U	91 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	19000 U	1400 U	-	5.1 U	4.5 U	91 U
1,2-Dichlorobenzene	µg/kg	19000 U	1400 U	-	5.1 U	4.5 U	91 U
1,2-Dichloroethane	µg/kg	19000 U	1400 U	-	5.1 U	4.5 U	91 U
1,2-Dichloropropane	µg/kg	19000 U	1400 U	-	5.1 U	4.5 U	91 U
1,3-Dichlorobenzene	µg/kg	19000 U	1400 U	-	5.1 U	4.5 U	91 U
1,4-Dichlorobenzene	µg/kg	19000 U	1400 U	-	5.1 U	4.5 U	91 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	96000 U	6800 U	-	25 U	23 U	460 U
2-Hexanone	µg/kg	96000 U	6800 U	-	25 U	23 U	460 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	96000 U	6800 U	-	25 U	23 U	460 U
Acetone	µg/kg	96000 U	6800 U	-	25 U	23 U	460 U
Benzene	µg/kg	19000 U	1400 U	-	5.1 U	4.5 U	91 U
Bromodichloromethane	µg/kg	19000 U	1400 U	-	5.1 U	4.5 U	91 U
Bromoform	µg/kg	19000 U	1400 U	-	5.1 U	4.5 U	91 U
Bromomethane (Methyl bromide)	µg/kg	19000 U	1400 U	-	5.1 U	4.5 U	91 U
Carbon disulfide	µg/kg	19000 U	1400 U	-	5.1 U	4.5 U	91 U
Carbon tetrachloride	µg/kg	19000 U	1400 U	-	5.1 U	4.5 U	91 U
Chlorobenzene	µg/kg	19000 U	1400 U	-	5.1 U	4.5 U	91 U
Chloroethane	µg/kg	19000 U	1400 U	-	5.1 U	4.5 U	91 U
Chloroform (Trichloromethane)	µg/kg	19000 U	1400 U	-	5.1 U	4.5 U	91 U
Chloromethane (Methyl chloride)	µg/kg	19000 U	1400 U	-	5.1 U	4.5 U	91 U
cis-1,2-Dichloroethene	µg/kg	19000 U	1400 U	-	5.1 U	4.5 U	91 U
cis-1,3-Dichloropropene	µg/kg	19000 U	1400 U	-	5.1 U	4.5 U	91 U
Cyclohexane	µg/kg	19000 U	1400 U	-	5.1 U	4.5 U	91 U
Dibromochloromethane	µg/kg	19000 U	1400 U	-	5.1 U	4.5 U	91 U
Dichlorodifluoromethane (CFC-12)	µg/kg	19000 U	1400 U	-	5.1 U	4.5 U	91 U
Ethylbenzene	µg/kg	19000 U	1400 U	-	5.1 U	4.5 U	91 U
Isopropyl benzene	µg/kg	19000 U	1400 U	-	5.1 U	4.5 U	91 U
Methyl acetate	µg/kg	96000 U	6800 U	-	25 U	23 U	460 U
Methyl cyclohexane	µg/kg	19000 U	1400 U	-	5.1 U	4.5 U	91 U
Methyl tert butyl ether (MTBE)	µg/kg	19000 U	1400 U	-	5.1 U	4.5 U	91 U
Methylene chloride	µg/kg	19000 U	1400 U	-	5.1 U	4.5 U	91 U
Styrene	µg/kg	19000 U	1400 U	-	5.1 U	4.5 U	91 U
Tetrachloroethene	µg/kg	19000 U	1400 U	-	5.1 U	4.5 U	91 U
Toluene	µg/kg	19000 U	1400 U	-	5.1 U	4.5 U	91 U
trans-1,2-Dichloroethene	µg/kg	19000 U	1400 U	-	5.1 U	4.5 U	91 U
trans-1,3-Dichloropropene	µg/kg	19000 U	1400 U	-	5.1 U	4.5 U	91 U
Trichloroethene	µg/kg	720000	47000	-	15	29	1100
Trichlorofluoromethane (CFC-11)	µg/kg	19000 U	1400 U	-	5.1 U	4.5 U	91 U
Trifluorotrichloroethane (CFC-113)	µg/kg	19000 U	1400 U	-	5.1 U	4.5 U	91 U
Vinyl chloride	µg/kg	19000 U	1400 U	-	5.1 U	4.5 U	91 U
Xylenes (total)	µg/kg	39000 U	2700 U	-	10 U	9.0 U	180 U
General Chemistry							
Fraction organic carbon (FOC)	%	-	-	0.3	-	-	-

Notes:

- J - Estimated concentration
- U - Not detected at the associated reporting limit
- UJ - Not detected; associated reporting limit is estimated
- R - Rejected
- ft. bgs - Feet Below Ground Surface
- = Not applicable

Table 2B

Analytical Results Summary
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Location ID:		MW-106	MW-106	MW-106	MW-106	MW-106	MW-106
Sample Name:		S-11219347-112020-AMC-192	S-11219347-112020-AMC-193	S-11219347-112020-AMC-194	S-11219347-112020-AMC-195	S-11219347-112020-AMC-196	S-11219347-112020-AMC-197
Sample Date:		11/20/2020	11/20/2020	11/20/2020	11/20/2020	11/20/2020	11/20/2020
Depth:		6-8 ft. bgs	8-10 ft. bgs	8-10 ft. bgs Duplicate	10-12 ft. bgs	12-14 ft. bgs	14-16 ft. bgs
Parameters	Unit						
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/kg	44 J	43 J	75 U	55	53	18
1,1,2,2-Tetrachloroethane	µg/kg	54 U	54 U	75 U	46 U	47 U	3.9 U
1,1,2-Trichloroethane	µg/kg	54 U	54 U	75 U	46 U	47 U	3.9 U
1,1-Dichloroethane	µg/kg	54 U	54 U	75 U	46 U	47 U	2.8 J
1,1-Dichloroethene	µg/kg	54 U	54 U	75 U	19 J	27 J	10
1,2,4-Trichlorobenzene	µg/kg	54 U	54 U	75 U	46 U	47 U	3.9 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	54 U	54 U	75 U	46 U	47 U	3.9 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	54 U	54 U	75 U	46 U	47 U	3.9 U
1,2-Dichlorobenzene	µg/kg	54 U	54 U	75 U	46 U	47 U	3.9 U
1,2-Dichloroethane	µg/kg	54 U	54 U	75 U	46 U	47 U	3.9 U
1,2-Dichloropropane	µg/kg	54 U	54 U	75 U	46 U	47 U	3.9 U
1,3-Dichlorobenzene	µg/kg	54 U	54 U	75 U	46 U	47 U	3.9 U
1,4-Dichlorobenzene	µg/kg	54 U	54 U	75 U	46 U	47 U	3.9 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	270 U	270 U	380 U	230 U	230 U	20 U
2-Hexanone	µg/kg	270 U	270 U	380 U	230 U	230 U	20 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	270 U	270 U	380 U	230 U	230 U	20 U
Acetone	µg/kg	270 U	270 U	380 U	230 U	230 U	20 U
Benzene	µg/kg	54 U	54 U	75 U	46 U	47 U	3.9 U
Bromodichloromethane	µg/kg	54 U	54 U	75 U	46 U	47 U	3.9 U
Bromoform	µg/kg	54 U	54 U	75 U	46 U	47 U	3.9 U
Bromomethane (Methyl bromide)	µg/kg	54 U	54 U	75 U	46 U	47 U	3.9 U
Carbon disulfide	µg/kg	54 U	54 U	75 U	46 U	47 U	3.9 U
Carbon tetrachloride	µg/kg	54 U	54 U	75 U	46 U	47 U	3.9 U
Chlorobenzene	µg/kg	54 U	54 U	75 U	46 U	47 U	3.9 U
Chloroethane	µg/kg	54 U	54 U	75 U	46 U	47 U	3.9 U
Chloroform (Trichloromethane)	µg/kg	54 U	54 U	75 U	46 U	47 U	0.39 J
Chloromethane (Methyl chloride)	µg/kg	54 U	54 U	75 U	46 U	47 U	3.9 U
cis-1,2-Dichloroethene	µg/kg	25 J	36 J	27 J	46 U	47 U	2.8 J
cis-1,3-Dichloropropene	µg/kg	54 U	54 U	75 U	46 U	47 U	3.9 U
Cyclohexane	µg/kg	54 U	54 U	75 U	46 U	47 U	3.9 U
Dibromochloromethane	µg/kg	54 U	54 U	75 U	46 U	47 U	3.9 U
Dichlorodifluoromethane (CFC-12)	µg/kg	54 U	54 U	75 U	46 U	47 U	3.9 U
Ethylbenzene	µg/kg	54 U	54 U	75 U	46 U	47 U	3.9 U
Isopropyl benzene	µg/kg	54 U	54 U	75 U	46 U	47 U	3.9 U
Methyl acetate	µg/kg	270 U	270 U	380 U	230 U	230 U	20 U
Methyl cyclohexane	µg/kg	54 U	54 U	75 U	46 U	47 U	3.9 U
Methyl tert butyl ether (MTBE)	µg/kg	54 U	54 U	75 U	46 U	47 U	3.9 U
Methylene chloride	µg/kg	54 U	54 U	75 U	46 U	47 U	3.9 U
Styrene	µg/kg	54 U	54 U	75 U	46 U	47 U	3.9 U
Tetrachloroethene	µg/kg	54 U	54 U	75 U	46 U	47 U	3.9 U
Toluene	µg/kg	54 U	54 U	75 U	46 U	47 U	3.9 U
trans-1,2-Dichloroethene	µg/kg	54 U	54 U	75 U	46 U	47 U	3.9 U
trans-1,3-Dichloropropene	µg/kg	54 U	54 U	75 U	46 U	47 U	3.9 U
Trichloroethene	µg/kg	790	650	410	500	880	240 J
Trichlorofluoromethane (CFC-11)	µg/kg	54 U	54 U	75 U	46 U	47 U	3.9 U
Trifluorotrichloroethane (CFC-113)	µg/kg	54 U	54 U	75 U	46 U	47 U	3.9 U
Vinyl chloride	µg/kg	54 U	54 U	75 U	46 U	47 U	3.9 U
Xylenes (total)	µg/kg	110 U	110 U	150 U	92 U	93 U	7.9 U
General Chemistry							
Fraction organic carbon (FOC)	%	-	-	-	-	-	-

Notes:

- J - Estimated concentration
- U - Not detected at the associated reporting limit
- UJ - Not detected; associated reporting limit is estimated
- R - Rejected
- ft. bgs - Feet Below Ground Surface
- = Not applicable

Table 2B

Analytical Results Summary
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Location ID: Sample Name: Sample Date: Depth:		MW-107 S-11219347-120120-AMC-218 12/01/2020 0.5-2 ft. bgs	MW-107 S-11219347-120120-AMC-219 12/01/2020 2-4 ft. bgs	MW-107 S-11219347-120120-AMC-220 12/01/2020 4-6 ft. bgs	MW-107 S-11219347-120120-AMC-221 12/01/2020 6-8 ft. bgs	MW-107 S-11219347-120120-AMC-222 12/01/2020 8-10 ft. bgs	MW-107 S-11219347-120120-AMC-223 12/01/2020 10-12 ft. bgs
Parameters	Unit						
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/kg	63	72	440	440	1900	1000
1,1,2,2-Tetrachloroethane	µg/kg	60 U	62 U	240 U	54 U	190 U	200 U
1,1,2-Trichloroethane	µg/kg	60 U	62 U	240 U	54 U	190 U	200 U
1,1-Dichloroethane	µg/kg	60 U	20 J	77 J	29 J	120 J	81 J
1,1-Dichloroethene	µg/kg	60 U	62 U	150 J	120	470	630
1,2,4-Trichlorobenzene	µg/kg	60 U	62 U	240 U	54 U	190 U	200 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	60 U	62 U	240 U	54 U	190 U	200 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	60 U	62 U	240 U	54 U	190 U	200 U
1,2-Dichlorobenzene	µg/kg	60 U	62 U	240 U	54 U	190 U	200 U
1,2-Dichloroethane	µg/kg	60 U	62 U	240 U	54 U	190 U	200 U
1,2-Dichloropropane	µg/kg	60 U	62 U	240 U	54 U	190 U	200 U
1,3-Dichlorobenzene	µg/kg	60 U	62 U	240 U	54 U	190 U	200 U
1,4-Dichlorobenzene	µg/kg	60 U	62 U	240 U	54 U	190 U	200 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	300 U	310 U	1200 U	270 U	950 U	990 U
2-Hexanone	µg/kg	300 U	310 U	1200 U	270 U	950 U	990 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	300 U	310 U	1200 U	270 U	950 U	990 U
Acetone	µg/kg	300 U	310 U	1200 U	270 U	950 U	990 U
Benzene	µg/kg	60 U	62 U	240 U	54 U	190 U	200 U
Bromodichloromethane	µg/kg	60 U	62 U	240 U	54 U	190 U	200 U
Bromoform	µg/kg	60 U	62 U	240 U	54 U	190 U	200 U
Bromomethane (Methyl bromide)	µg/kg	60 U	62 U	240 U	54 U	190 U	200 U
Carbon disulfide	µg/kg	60 U	62 U	240 U	54 U	190 U	200 U
Carbon tetrachloride	µg/kg	60 U	62 U	240 U	54 U	190 U	200 U
Chlorobenzene	µg/kg	60 U	62 U	240 U	54 U	190 U	200 U
Chloroethane	µg/kg	60 U	62 U	240 U	54 U	190 U	200 U
Chloroform (Trichloromethane)	µg/kg	60 U	62 U	240 U	54 U	190 U	200 U
Chloromethane (Methyl chloride)	µg/kg	60 U	62 U	240 U	54 U	190 U	200 U
cis-1,2-Dichloroethene	µg/kg	280	460	490	140	500	340
cis-1,3-Dichloropropene	µg/kg	60 U	62 U	240 U	54 U	190 U	200 U
Cyclohexane	µg/kg	60 U	62 U	240 U	54 U	190 U	200 U
Dibromochloromethane	µg/kg	60 U	62 U	240 U	54 U	190 U	200 U
Dichlorodifluoromethane (CFC-12)	µg/kg	60 U	62 U	240 U	54 U	190 U	200 U
Ethylbenzene	µg/kg	60 U	62 U	240 U	54 U	190 U	200 U
Isopropyl benzene	µg/kg	60 U	62 U	240 U	54 U	190 U	200 U
Methyl acetate	µg/kg	300 U	310 U	1200 U	270 U	950 U	990 U
Methyl cyclohexane	µg/kg	60 U	62 U	240 U	54 U	190 U	200 U
Methyl tert butyl ether (MTBE)	µg/kg	60 U	62 U	240 U	54 U	190 U	200 U
Methylene chloride	µg/kg	60 U	62 U	240 U	54 U	190 U	200 U
Styrene	µg/kg	60 U	62 U	240 U	54 U	190 U	200 U
Tetrachloroethene	µg/kg	60 U	23 J	240 U	54 U	190 U	200 U
Toluene	µg/kg	34 J	23 J	240 U	54 U	190 U	200 U
trans-1,2-Dichloroethene	µg/kg	60 U	62 U	240 U	54 U	190 U	200 U
trans-1,3-Dichloropropene	µg/kg	60 U	62 U	240 U	54 U	190 U	200 U
Trichloroethene	µg/kg	1700	2300	7700	2800	10000	9500
Trichlorofluoromethane (CFC-11)	µg/kg	60 U	62 U	240 U	54 U	190 U	200 U
Trifluorotrichloroethane (CFC-113)	µg/kg	60 U	62 U	240 U	54 U	190 U	200 U
Vinyl chloride	µg/kg	60 U	62 U	240 U	54 U	190 U	200 U
Xylenes (total)	µg/kg	120 U	120 U	470 U	110 U	380 U	400 U
General Chemistry							
Fraction organic carbon (FOC)	%	-	-	-	-	-	0.4

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit
UJ - Not detected; associated reporting limit is estimated
R - Rejected
ft. bgs - Feet Below Ground Surface
- = Not applicable

Table 2B

Analytical Results Summary
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Location ID: Sample Name: Sample Date: Depth:		MW-107 S-11219347-120120-AMC-224 12/01/2020 12-14 ft. bgs	MW-107 S-11219347-120120-AMC-225 12/01/2020 14-16.2 ft. bgs	MW-108 S-11219347-120220-AMC-226 12/02/2020 0.5-2 ft. bgs	MW-108 S-11219347-120220-AMC-227 12/02/2020 2-4 ft. bgs	MW-108 S-11219347-120220-AMC-228 12/02/2020 4-6 ft. bgs	MW-108 S-11219347-120220-AMC-229 12/02/2020 6-8 ft. bgs
Parameters	Unit						
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/kg	200 U	680 U	110	19 J	640	270
1,1,2,2-Tetrachloroethane	µg/kg	200 U	680 U	63 U	66 U	130 U	56 U
1,1,2-Trichloroethane	µg/kg	200 U	680 U	63 U	66 U	130 U	56 U
1,1-Dichloroethane	µg/kg	200 U	680 U	63 U	66 U	100 J	56 U
1,1-Dichloroethene	µg/kg	290	680 U	63 U	66 U	100 J	56 U
1,2,4-Trichlorobenzene	µg/kg	200 U	680 U	63 U	66 U	130 U	56 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	200 U	680 U	63 U	66 U	130 U	56 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	200 U	680 U	63 U	66 U	130 U	56 U
1,2-Dichlorobenzene	µg/kg	200 U	680 U	63 U	66 U	130 U	56 U
1,2-Dichloroethane	µg/kg	200 U	680 U	63 U	66 U	130 U	56 U
1,2-Dichloropropane	µg/kg	200 U	680 U	63 U	66 U	130 U	56 U
1,3-Dichlorobenzene	µg/kg	200 U	680 U	63 U	66 U	130 U	56 U
1,4-Dichlorobenzene	µg/kg	200 U	680 U	63 U	66 U	130 U	56 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	980 U	3400 U	320 U	330 U	660 U	280 U
2-Hexanone	µg/kg	980 U	3400 U	320 U	330 U	660 U	280 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	980 U	3400 U	320 U	330 U	660 U	280 U
Acetone	µg/kg	980 U	3400 U	320 U	330 U	660 U	280 U
Benzene	µg/kg	200 U	680 U	63 U	66 U	130 U	56 U
Bromodichloromethane	µg/kg	200 U	680 U	63 U	66 U	130 U	56 U
Bromoform	µg/kg	200 U	680 U	63 U	66 U	130 U	56 U
Bromomethane (Methyl bromide)	µg/kg	200 U	680 U	63 U	66 U	130 U	56 U
Carbon disulfide	µg/kg	200 U	680 U	63 U	66 U	130 U	56 U
Carbon tetrachloride	µg/kg	200 U	680 U	63 U	66 U	130 U	56 U
Chlorobenzene	µg/kg	200 U	680 U	63 U	66 U	130 U	56 U
Chloroethane	µg/kg	200 U	680 U	63 U	66 U	130 U	56 U
Chloroform (Trichloromethane)	µg/kg	200 U	680 U	63 U	66 U	130 U	56 U
Chloromethane (Methyl chloride)	µg/kg	200 U	680 U	63 U	66 U	130 U	56 U
cis-1,2-Dichloroethene	µg/kg	210	680 U	63	66 U	330	56 U
cis-1,3-Dichloropropene	µg/kg	200 U	680 U	63 U	66 U	130 U	56 U
Cyclohexane	µg/kg	200 U	680 U	63 U	66 U	130 U	56 U
Dibromochloromethane	µg/kg	200 U	680 U	63 U	66 U	130 U	56 U
Dichlorodifluoromethane (CFC-12)	µg/kg	200 U	680 U	63 U	66 U	130 U	56 U
Ethylbenzene	µg/kg	200 U	680 U	63 U	66 U	130 U	56 U
Isopropyl benzene	µg/kg	200 U	680 U	63 U	66 U	130 U	56 U
Methyl acetate	µg/kg	980 U	3400 U	320 U	330 U	660 U	280 U
Methyl cyclohexane	µg/kg	200 U	680 U	40 J	66 U	81 J	56 U
Methyl tert butyl ether (MTBE)	µg/kg	200 U	680 U	63 U	66 U	130 U	56 U
Methylene chloride	µg/kg	200 U	680 U	63 U	66 U	130 U	56 U
Styrene	µg/kg	200 U	680 U	63 U	66 U	130 U	56 U
Tetrachloroethene	µg/kg	200 U	680 U	63 U	66 U	130 U	56 U
Toluene	µg/kg	200 U	680 U	67	66 U	130 U	56 U
trans-1,2-Dichloroethene	µg/kg	200 U	680 U	63 U	66 U	130 U	56 U
trans-1,3-Dichloropropene	µg/kg	200 U	680 U	63 U	66 U	130 U	56 U
Trichloroethene	µg/kg	6300	24000	1500	300	6200	1500
Trichlorofluoromethane (CFC-11)	µg/kg	200 U	680 U	63 U	66 U	130 U	56 U
Trifluorotrichloroethane (CFC-113)	µg/kg	200 U	680 U	63 U	66 U	130 U	56 U
Vinyl chloride	µg/kg	200 U	680 U	63 U	66 U	130 U	56 U
Xylenes (total)	µg/kg	390 U	1400 U	37 J	130 U	270 U	110 U
General Chemistry							
Fraction organic carbon (FOC)	%	-	-	-	-	-	-

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit
UJ - Not detected; associated reporting limit is estimated
R - Rejected
ft. bgs - Feet Below Ground Surface
- = Not applicable

Table 2B

Analytical Results Summary
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Location ID:		MW-108	MW-108	MW-108	MW-108	MW-109	MW-109
Sample Name:		S-11219347-120220-AMC-230	S-11219347-120220-AMC-231	S-11219347-120220-AMC-232	S-11219347-120220-AMC-233	S-11219347-112520-AMC-209	S-11219347-112520-AMC-210
Sample Date:		12/02/2020	12/02/2020	12/02/2020	12/02/2020	11/25/2020	11/25/2020
Depth:		8-10 ft. bgs	10-12 ft. bgs	12-14 ft. bgs	14-15.9 ft. bgs	2-4 ft. bgs	6-8 ft. bgs
Parameters	Unit						
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/kg	91	120	49 J	50 J	5600	54000
1,1,2,2-Tetrachloroethane	µg/kg	59 U	52 U	53 U	54 U	290 U	2000 U
1,1,2-Trichloroethane	µg/kg	59 U	52 U	53 U	54 U	290 U	2000 U
1,1-Dichloroethane	µg/kg	59 U	52 U	53 U	54 U	290 U	2000 U
1,1-Dichloroethene	µg/kg	59 U	52 U	53 U	54 U	240 J	19000
1,2,4-Trichlorobenzene	µg/kg	59 U	52 U	53 U	54 U	290 U	2000 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	59 U	52 U	53 U	54 U	290 U	2000 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	59 U	52 U	53 U	54 U	290 U	2000 U
1,2-Dichlorobenzene	µg/kg	59 U	52 U	53 U	54 U	290 U	2000 U
1,2-Dichloroethane	µg/kg	59 U	52 U	53 U	54 U	290 U	2000 U
1,2-Dichloropropane	µg/kg	59 U	52 U	53 U	54 U	290 U	2000 U
1,3-Dichlorobenzene	µg/kg	59 U	52 U	53 U	54 U	290 U	2000 U
1,4-Dichlorobenzene	µg/kg	59 U	52 U	53 U	54 U	290 U	2000 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	300 U	260 U	270 U	270 U	1500 U	10000 U
2-Hexanone	µg/kg	300 U	260 U	270 U	270 U	1500 U	10000 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	300 U	260 U	270 U	270 U	1500 U	10000 U
Acetone	µg/kg	300 U	260 U	270 U	270 U	1500 U	10000 U
Benzene	µg/kg	59 U	52 U	53 U	54 U	290 U	2000 U
Bromodichloromethane	µg/kg	59 U	52 U	53 U	54 U	290 U	2000 U
Bromoform	µg/kg	59 U	52 U	53 U	54 U	290 U	2000 U
Bromomethane (Methyl bromide)	µg/kg	59 U	52 U	53 U	54 U	290 U	2000 U
Carbon disulfide	µg/kg	59 U	52 U	53 U	54 U	290 U	2000 U
Carbon tetrachloride	µg/kg	59 U	52 U	53 U	54 U	290 U	2000 U
Chlorobenzene	µg/kg	59 U	52 U	53 U	54 U	290 U	2000 U
Chloroethane	µg/kg	59 U	52 U	53 U	54 U	290 U	2000 U
Chloroform (Trichloromethane)	µg/kg	59 U	52 U	53 U	54 U	290 U	2000 U
Chloromethane (Methyl chloride)	µg/kg	59 U	52 U	53 U	54 U	290 U	2000 U
cis-1,2-Dichloroethene	µg/kg	59 U	52 U	53 U	54 U	520	2000 U
cis-1,3-Dichloropropene	µg/kg	59 U	52 U	53 U	54 U	290 U	2000 U
Cyclohexane	µg/kg	59 U	52 U	53 U	54 U	290 U	2000 U
Dibromochloromethane	µg/kg	59 U	52 U	53 U	54 U	290 U	2000 U
Dichlorodifluoromethane (CFC-12)	µg/kg	59 U	52 U	53 U	54 U	290 U	2000 U
Ethylbenzene	µg/kg	59 U	52 U	53 U	54 U	290 U	2000 U
Isopropyl benzene	µg/kg	59 U	52 U	53 U	54 U	290 U	2000 U
Methyl acetate	µg/kg	300 U	260 U	270 U	270 U	3400	10000 U
Methyl cyclohexane	µg/kg	59 U	52 U	53 U	54 U	290 U	2000 U
Methyl tert butyl ether (MTBE)	µg/kg	59 U	52 U	53 U	54 U	290 U	2000 U
Methylene chloride	µg/kg	59 U	52 U	53 U	54 U	290 U	2000 U
Styrene	µg/kg	59 U	52 U	53 U	54 U	290 U	2000 U
Tetrachloroethene	µg/kg	59 U	52 U	53 U	54 U	290 U	2000 U
Toluene	µg/kg	59 U	52 U	53 U	54 U	290 U	2000 U
trans-1,2-Dichloroethene	µg/kg	59 U	52 U	53 U	54 U	290 U	2000 U
trans-1,3-Dichloropropene	µg/kg	59 U	52 U	53 U	54 U	290 U	2000 U
Trichloroethene	µg/kg	470	1000	250	310	19000	60000
Trichlorofluoromethane (CFC-11)	µg/kg	59 U	52 U	53 U	54 U	290 U	2000 U
Trifluorotrichloroethane (CFC-113)	µg/kg	59 U	52 U	53 U	54 U	290 U	2000 U
Vinyl chloride	µg/kg	59 U	52 U	53 U	54 U	290 U	2000 U
Xylenes (total)	µg/kg	120 U	100 U	110 U	110 U	590 U	4000 U
General Chemistry							
Fraction organic carbon (FOC)	%	-	-	-	-	-	-

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit
UJ - Not detected; associated reporting limit is estimated
R - Rejected
ft. bgs - Feet Below Ground Surface
- = Not applicable

Table 2B

Analytical Results Summary
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Location ID:		MW-109	MW-109	MW-109	MW-110	MW-110	MW-110
Sample Name:		S-11219347-112520-AMC-211	S-11219347-112520-AMC-212	S-11219347-112520-AMC-208	S-11219347-113020-AMC-216	S-11219347-113020-AMC-217	S-11219347-113020-AMC-215
Sample Date:		11/25/2020	11/25/2020	11/25/2020	11/30/2020	11/30/2020	11/30/2020
Depth:		8-10 ft. bgs	10-10.7 ft. bgs	0-2 ft. bgs	2-4 ft. bgs	4-6 ft. bgs	0-2 ft. bgs
Parameters	Unit						
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/kg	110000	110000	670	860	530	680
1,1,2,2-Tetrachloroethane	µg/kg	4800 U	1100 U	64 U	67 U	65 U	59 U
1,1,2-Trichloroethane	µg/kg	4800 U	1100 U	64 U	67 U	65 U	59 U
1,1-Dichloroethane	µg/kg	4800 U	1100 U	64 U	120	100	29 J
1,1-Dichloroethene	µg/kg	25000	19000	39 J	74	65 U	59 U
1,2,4-Trichlorobenzene	µg/kg	4800 U	1100 U	64 U	67 U	65 U	59 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	4800 U	1100 U	64 U	67 U	65 U	59 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	4800 U	1100 U	64 U	67 U	65 U	59 U
1,2-Dichlorobenzene	µg/kg	4800 U	1100 U	64 U	67 U	65 U	59 U
1,2-Dichloroethane	µg/kg	4800 U	1100 U	64 U	67 U	65 U	59 U
1,2-Dichloropropane	µg/kg	4800 U	1100 U	64 U	67 U	65 U	59 U
1,3-Dichlorobenzene	µg/kg	4800 U	1100 U	64 U	67 U	65 U	59 U
1,4-Dichlorobenzene	µg/kg	4800 U	1100 U	64 U	67 U	65 U	59 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	24000 U	5700 U	320 U	340 U	330 U	300 U
2-Hexanone	µg/kg	24000 U	5700 U	320 U	340 U	330 U	300 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	24000 U	5700 U	320 U	340 U	330 U	300 U
Acetone	µg/kg	24000 U	5700 U	320 U	340 U	330 U	300 U
Benzene	µg/kg	4800 U	1100 U	64 U	67 U	65 U	59 U
Bromodichloromethane	µg/kg	4800 U	1100 U	64 U	67 U	65 U	59 U
Bromoform	µg/kg	4800 U	1100 U	64 U	67 U	65 U	59 U
Bromomethane (Methyl bromide)	µg/kg	4800 U	1100 U	64 U	67 U	65 U	59 U
Carbon disulfide	µg/kg	4800 U	1100 U	64 U	67 U	65 U	59 U
Carbon tetrachloride	µg/kg	4800 U	1100 U	64 U	67 U	65 U	59 U
Chlorobenzene	µg/kg	4800 U	1100 U	64 U	67 U	65 U	59 U
Chloroethane	µg/kg	4800 U	1100 U	64 U	67 U	65 U	59 U
Chloroform (Trichloromethane)	µg/kg	4800 U	1100 U	64 U	67 U	65 U	59 U
Chloromethane (Methyl chloride)	µg/kg	4800 U	1100 U	64 U	67 U	65 U	59 U
cis-1,2-Dichloroethene	µg/kg	4800 U	1100 U	110	1000	2200	170
cis-1,3-Dichloropropene	µg/kg	4800 U	1100 U	64 U	67 U	65 U	59 U
Cyclohexane	µg/kg	4800 U	1100 U	64 U	67 U	65 U	59 U
Dibromochloromethane	µg/kg	4800 U	1100 U	64 U	67 U	65 U	59 U
Dichlorodifluoromethane (CFC-12)	µg/kg	4800 U	1100 U	64 U	67 U	65 U	59 U
Ethylbenzene	µg/kg	4800 U	880 J	64 U	67 U	65 U	59 U
Isopropyl benzene	µg/kg	4800 U	540 J	64 U	67 U	65 U	59 U
Methyl acetate	µg/kg	24000 U	5700 U	320 U	340 U	330 U	130 J
Methyl cyclohexane	µg/kg	4800 U	1100 U	36 J	67 U	65 U	59 U
Methyl tert butyl ether (MTBE)	µg/kg	4800 U	1100 U	64 U	67 U	65 U	59 U
Methylene chloride	µg/kg	4800 U	1100 U	64 U	67 U	65 U	59 U
Styrene	µg/kg	4800 U	1100 U	64 U	67 U	65 U	59 U
Tetrachloroethene	µg/kg	4800 U	1100 U	64 U	67 U	65 U	59 U
Toluene	µg/kg	4800 U	560 J	64 U	67 U	65 U	19 J
trans-1,2-Dichloroethene	µg/kg	4800 U	1100 U	64 U	24 J	39 J	59 U
trans-1,3-Dichloropropene	µg/kg	4800 U	1100 U	64 U	67 U	65 U	59 U
Trichloroethene	µg/kg	91000	78000	5400	3300	3100	2500
Trichlorofluoromethane (CFC-11)	µg/kg	4800 U	1100 U	64 U	67 U	65 U	59 U
Trifluorotrichloroethane (CFC-113)	µg/kg	4800 U	1100 U	64 U	67 U	65 U	59 U
Vinyl chloride	µg/kg	4800 U	1100 U	64 U	67 U	65 U	59 U
Xylenes (total)	µg/kg	9500 U	3500	130 U	130 U	130 U	120 U
General Chemistry							
Fraction organic carbon (FOC)	%	-	-	-	-	-	-

Notes:

J - Estimated concentration
U - Not detected at the associated reporting limit
UJ - Not detected; associated reporting limit is estimated
R - Rejected
ft. bgs - Feet Below Ground Surface
- = Not applicable

Table 2C

**Analytical Results Summary
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020**

Location ID:
Sample Name:
Sample Date:

MW-103
P-11219347-111920-JDA-01
11/19/2020

Parameters	Unit	
Volatile Organic Compounds		
1,1,1-Trichloroethane	µg/kg	99 U
1,1,2,2-Tetrachloroethane	µg/kg	99 U
1,1,2-Trichloroethane	µg/kg	99 U
1,1-Dichloroethane	µg/kg	190
1,1-Dichloroethene	µg/kg	99 U
1,2,4-Trichlorobenzene	µg/kg	99 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	99 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	99 U
1,2-Dichlorobenzene	µg/kg	99 U
1,2-Dichloroethane	µg/kg	99 U
1,2-Dichloropropane	µg/kg	99 U
1,3-Dichlorobenzene	µg/kg	99 U
1,4-Dichlorobenzene	µg/kg	99 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	500 U
2-Hexanone	µg/kg	500 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	500 U
Acetone	µg/kg	500 U
Benzene	µg/kg	99 U
Bromodichloromethane	µg/kg	99 U
Bromoform	µg/kg	99 U
Bromomethane (Methyl bromide)	µg/kg	99 U
Carbon disulfide	µg/kg	99 U
Carbon tetrachloride	µg/kg	99 U
Chlorobenzene	µg/kg	99 U
Chloroethane	µg/kg	99 U
Chloroform (Trichloromethane)	µg/kg	99 U
Chloromethane (Methyl chloride)	µg/kg	99 U
cis-1,2-Dichloroethene	µg/kg	150
cis-1,3-Dichloropropene	µg/kg	99 U
Cyclohexane	µg/kg	99 U
Dibromochloromethane	µg/kg	99 U
Dichlorodifluoromethane (CFC-12)	µg/kg	99 U
Ethylbenzene	µg/kg	99 U
Isopropyl benzene	µg/kg	99 U
Methyl acetate	µg/kg	500 U
Methyl cyclohexane	µg/kg	99 U
Methyl tert butyl ether (MTBE)	µg/kg	99 U
Methylene chloride	µg/kg	99 U
Styrene	µg/kg	99 U
Tetrachloroethene	µg/kg	99 U
Toluene	µg/kg	99 U
trans-1,2-Dichloroethene	µg/kg	99 U
trans-1,3-Dichloropropene	µg/kg	99 U
Trichloroethene	µg/kg	99 U
Trichlorofluoromethane (CFC-11)	µg/kg	99 U
Trifluorotrchloroethane (CFC-113)	µg/kg	99 U
Vinyl chloride	µg/kg	240
Xylenes (total)	µg/kg	200 U

Table 2C

Analytical Results Summary
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Location ID:
Sample Name:
Sample Date:

MW-103
P-11219347-111920-JDA-01
11/19/2020

Parameters	Unit	
Total Petroleum Hydrocarbons (TPH)		
Total Petroleum Hydrocarbons (C10-C28) DRO	mg/kg	5500
Total Petroleum Hydrocarbons (C28-C40) ORO	mg/kg	3600 U
General Chemistry		
Specific gravity	g/mL	1.0

Notes:

U - Not detected at the associated reporting limit

Table 3

**Analytical Methods
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020**

Parameter	Method	Matrix	Holding Time	
			Collection to Extraction (Days)	Collection or Extraction to Analysis (Days)
Volatile Organic Compounds (VOCs)	SW-846 8260B	Water, NAPL	-	14
Fraction Organic Carbon (FOC)	ASTM D2974	Soil	-	28
TPH DRO/ORO	SW-846 8015D	NAPL	14	40
Specific Gravity	ASTM D1429	NAPL	-	28

Notes:

TPH - Total Petroleum Hydrocarbon
DRO - Diesel Range Organics
ORO - Oil Range Organics
NAPL - Non aqueous Phase Liquids
- - Not applicable

Method References:

SW-846 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, 1986, with subsequent revisions
ASTM - Annual Book of ASTM Standards, American Society for Testing Materials, Section 5 and Section 11

Table 4

Qualified Sample Results Due to Outlying Laboratory Control Sample Results
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Parameter	Analyte	LCS Date (mm/dd/yyyy)	LCS % Recovery	Control Limits % Recovery	Associated Sample ID	Qualified Results	Units
VOCs	Methyl tert butyl ether (MTBE)	11/24/2020	75	77 - 120	WG-11219347-111720-AMC-155	2000 UJ	µg/L
VOCs	Methyl tert butyl ether (MTBE)	11/28/2020	67	77 - 120	WG-11219347-111820-AMC-178	5.0 UJ	µg/L
					WG-11219347-111820-AMC-185	10 UJ	µg/L
					WG-11219347-111820-AMC-180	4.0 UJ	µg/L
					WG-11219347-111920-AMC-186	100 UJ	µg/L
					WG-11219347-111920-AMC-187	1000 UJ	µg/L

Notes:

- LCS - Laboratory Control Sample
- UJ - Not detected; associated reporting limit is estimated
- VOCs - Volatile Organic Compounds

Table 5

Qualified Sample Results Due to Outlying MS/MSD Results
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Parameter	Sample ID	Analyte	MS	MSD	RPD (percent)	Control Limits		Qualified Result	Units
			% Recovery	% Recovery		% Recovery	RPD		
VOCs	WG-11219347-111120-AMC-071	Methyl tert butyl ether (MTBE)	74	76	2	77 - 120	37	50 UJ	µg/L
		Trichloroethene	52	66	5	74 - 123	16	2700 J	µg/L
VOCs	WG-11219347-111720-AMC-155	Trichloroethene	54	47	4	74 - 123	16	52000 J	µg/L
VOCs	S-11219347-111020-AMC-027	1,1,2,2-Tetrachloroethane	63	67	2	80 - 120	30	4.5 UJ	µg/kg
		1,1,2-Trichloroethane	71	71	5	78 - 122	30	4.5 UJ	µg/kg
		1,2-Dibromo-3-chloropropane (DBCP)	61	61	4	63 - 124	30	4.5 UJ	µg/kg
		1,2-Dibromoethane (Ethylene dibromide)	69	69	4	78 - 120	30	4.5 UJ	µg/kg
		1,2-Dichloroethane	75	78	1	77 - 122	30	4.5 UJ	µg/kg
		2-Butanone (Methyl ethyl ketone) (MEK)	56	56	5	70 - 134	30	23 UJ	µg/kg
		2-Hexanone	58	58	6	59 - 130	30	23 UJ	µg/kg
		4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	60	60	5	65 - 133	30	23 UJ	µg/kg
VOCs	S-11219347-112520-AMC-204	Acetone	56	58	1	61 - 137	30	23 UJ	µg/kg
		1,1,2,2-Tetrachloroethane	57	61	8	80 - 120	30	4.1 UJ	µg/kg
		1,1,2-Trichloroethane	67	71	7	78 - 122	30	4.1 UJ	µg/kg
		1,2-Dibromo-3-chloropropane (DBCP)	49	59	4	63 - 124	30	4.1 UJ	µg/kg
		1,2-Dibromoethane (Ethylene dibromide)	63	71	1	78 - 120	30	4.1 UJ	µg/kg
		1,2-Dichloroethane	74	75	12	77 - 122	30	4.1 UJ	µg/kg
		2-Butanone (Methyl ethyl ketone) (MEK)	59	63	8	70 - 134	30	20 UJ	µg/kg
		Benzene	76	78	11	79 - 127	30	4.1 UJ	µg/kg
VOCs	S-11219347-111220-AMC-082	cis-1,3-Dichloropropene	76	78	11	80 - 120	30	4.1 UJ	µg/kg
		Ethylbenzene	75	79	8	80 - 120	30	4.1 UJ	µg/kg
VOCs	S-11219347-111620-AMC-131	1,1,2-Trichloroethane	135	56	67	63 - 133	20	230 UJ	µg/kg
VOCs	S-11219347-111620-AMC-131	cis-1,2-Dichloroethene	143	150	4	65 - 137	20	740 J	µg/kg
VOCs	S-11219347-111820-AMC-179	1,1,2,2-Tetrachloroethane	59	62	19	80 - 120	30	3.5 UJ	µg/kg
		1,1,2-Trichloroethane	69	75	22	78 - 122	30	3.5 UJ	µg/kg
		1,2-Dibromo-3-chloropropane (DBCP)	53	59	26	63 - 124	30	3.5 UJ	µg/kg
		1,2-Dibromoethane (Ethylene dibromide)	70	72	17	78 - 120	30	3.5 UJ	µg/kg
		2-Butanone (Methyl ethyl ketone) (MEK)	58	62	20	70 - 134	30	3.5 UJ	µg/kg
		4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	63	64	16	65 - 133	30	18 UJ	µg/kg
VOCs	S-11219347-111620-AMC-146	1,1,1-Trichloroethane	28	47	53	64 - 142	20	50 UJ	µg/kg
		1,1-Dichloroethene	16	33	70	62 - 145	20	50 UJ	µg/kg
		1,2,4-Trichlorobenzene	41	41	1	56 - 145	20	50 UJ	µg/kg
		1,2-Dichlorobenzene	48	47	2	68 - 133	20	50 UJ	µg/kg
		1,3-Dichlorobenzene	36	35	2	68 - 136	20	50 UJ	µg/kg
		1,4-Dichlorobenzene	37	36	4	69 - 136	20	50 UJ	µg/kg

Table 5

Qualified Sample Results Due to Outlying MS/MSD Results
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Parameter	Sample ID	Analyte	MS	MSD	RPD	Control Limits		Qualified Result	Units
			% Recovery	% Recovery		% Recovery	RPD		
VOCs	S-11219347-111620-AMC-146	Benzene	46	66	34	68 - 137	20	50 UJ	µg/kg
		Bromomethane (Methyl bromide)	27	41	42	38 - 137	20	50 UJ	µg/kg
		Carbon disulfide	12	21	51	52 - 139	20	50 UJ	µg/kg
		Carbon tetrachloride	16	29	54	60 - 150	20	50 UJ	µg/kg
		Chlorobenzene	45	49	9	67 - 136	20	50 UJ	µg/kg
		Chloroethane	19	32	54	34 - 140	20	50 UJ	µg/kg
		Chloromethane (Methyl chloride)	18	32	56	47 - 143	20	50 UJ	µg/kg
		cis-1,2-Dichloroethene	56	78	32	65 - 137	20	48 J	µg/kg
		Cyclohexane	7	9	21	63 - 149	20	R	µg/kg
		Dichlorodifluoromethane (CFC-12)	2	0	NC	26 - 150	20	R	µg/kg
		Ethylbenzene	28	30	7	67 - 136	20	50 UJ	µg/kg
		Isopropyl benzene	22	24	9	65 - 147	20	50 UJ	µg/kg
		Methyl cyclohexane	7	8	19	67 - 150	20	50 R	µg/kg
		Styrene	45	45	0	68 - 137	20	50 UJ	µg/kg
		Trichloroethene	0.9	19	33	69 - 143	20	490 J	µg/kg
		Trichlorofluoromethane (CFC-11)	7	13	63	35 - 150	20	R	µg/kg
		Trifluorotrichloroethane (CFC-113)	6	9	43	64 - 154	20	R	µg/kg
		Vinyl chloride	8	21	89	56 - 150	20	R	µg/kg

Notes:

- MS - Matrix Spike
- MSD - Matrix Spike Duplicate
- RPD - Relative Percent Difference
- J - Estimated concentration
- UJ - Not detected; associated reporting limit is estimated
- R - Rejected
- VOCs - Volatile Organic Compounds

Table 6

Qualified Sample Data Due to Variability in Field Duplicate Results
Pre-Design Investigation
Jenesis Leisure Living Site
Buffalo, New York
November-December 2020

Parameter	Analyte	RPD	Sample ID	Qualified Result	Field Duplicate Sample ID	Qualified Result	Units
VOCs	1,1,1-Trichloroethane Trichloroethene	156 134	S-11219347-111620-AMC-133	78000 J 2200000 J	S-11219347-111620-AMC-134	9400 J 430000 J	µg/kg µg/kg

Notes:

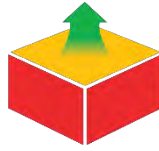
RPD - Relative Percent Difference
J - Estimated concentration
VOCs - Volatile Organic Compounds

Appendix C

TerraTherm

In Situ Thermal Remedial Action Work Plan

ADVISE | DESIGN | BUILD | OPERATE



TERRATHERM
a Cascade Company



In Situ Thermal Remedial Action Work Plan

In Situ Thermal Remediation

1130 Niagara Street Site

Buffalo, NY

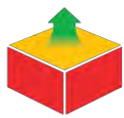
July 2022

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Attachment F – ISTR Implementation Schedule

ACRONYMS AND ABBREVIATIONS

°C	Degrees Celsius
°F	Degrees Fahrenheit
"w.c.	Inches of Water Column
µg/kg	Micrograms per Kilogram
µg/L	Micrograms per Liter
1,1,1-TCA	1,1,1-Trichloroethane
A	Amp
ANSI	American National Standards Institute
ATS	Automatic Transfer Switch
cis-1,2-DCE	Cis-1,2-Dichloroethene
COC	Contaminant of Concern
CVOC	Chlorinated Volatile Organic Compound
cy	Cubic Yards
DNAPL	Dense Non-Aqueous Phase Liquid
EPA	Environmental Protection Agency
ft	Feet
ft/day	Feet per Day
ft/ft	Feet per Foot
ft bgs	Feet Below Ground Surface
ft ²	Square Feet
gpm	Gallons per Minute
HAP	Hazardous Air Pollutant
HCl	Hydrochloric Acid
HVEW	Horizontal Vapor Extraction Well
IEEE	Institute of Electrical and Electronics Engineers
ID	Inner Diameter
in	Inch
ISTR	In Situ Thermal Remediation
kAIC	Kilo Ampere Interruption Capacity
kVA	Kilovolt-Ampere
kW	Kilowatt
kWh	Kilowatt-Hour
lb	Pound
lb/hr	Pound per Hour
lb/yr	Pound per Year
LGAC	Liquid Granular Activated Carbon
LNAPL	Light Non-Aqueous Phase Liquid
mg/kg	Milligrams per Kilogram
NAPL	Non-Aqueous Phase Liquid
NEC	National Electric Code
NEMA	National Electrical Manufacturers Association

NYSDEC	New York State Department of Environmental Conservation
O&M	Operations and Monitoring
OD	Outer Diameter
P&ID	Piping and Instrumentation Diagram
PCE	Tetrachloroethene
PID	Photoionization Detector
PLC	Programmable Logic Controller
PMP	Pressure Monitoring Point
ppmV	Parts per Million by Volume
RAWP	Remedial Action Work Plan
scfm	Standard Cubic Feet per Minute
SCR	Silicon Controlled Rectifier
SOP	Standard Operating Procedure
SVOC	Semi-Volatile Organic Compound
TCE	Trichloroethene
TCH	Thermal Conduction Heating
TMP	Temperature Monitoring Point
TTZ	Target Treatment Zone
V	Volt
VEW	Vapor Extraction Well
VGAC	Vapor Phase Granular Activated Carbon
VOC	Volatile Organic Compound

1 INTRODUCTION

This In Situ Thermal Remediation (ISTR) Remedial Action Work Plan (RAWP) presents TerraTherm, Inc.'s (TerraTherm's) approach for the ISTR treatment at the 1130 Niagara Street Site, Buffalo, New York (the Site), BCP #C915284. TerraTherm is performing the work under contract to Rich Products Corp. (Rich). GHD, Rich's consultant, is responsible for overseeing and reporting the remedial action to the New York State Department of Environmental Conservation (NYSDEC). The selected thermal remedy will consist of Thermal Conduction Heating (TCH) to achieve 100 degrees Celsius (°C) in the Target Treatment Zone (TTZ). For performance monitoring purposes, an average temperature of approximately 95 °C has been determined to be sufficient to achieve remedial goals while also recognizing the accuracy of the temperature monitoring system.

The treatment area at the Site is subdivided into eight Subareas (Subareas A through H) and have been defined as the zones where soil contains trichloroethene (TCE) concentrations greater than 1 milligram per kilogram (mg/kg). The treatment area encompasses both Parcels 1 and 2. Parcel 1 consists of the location of a demolished warehouse (2016), is level and covered with the remaining concrete slab from the former warehouse. Parcel 2 consists of the site of a 2008 fire and is an open grassy field that slopes from east to west. The target treatment depth extends from surface to between 15 and 27 feet below ground surface (ft bgs) across the Site.

The ISTR system to be installed at the Site includes 80 TCH wells to heat subsurface soil. Eight temperature monitoring points (TMPs) will collect temperature data to support and to track subsurface heating. Four pressure monitoring points (PMPs) will be installed around the perimeter of the Site to monitor pneumatic control at the Site during the remedy. Eighteen horizontal vapor extraction wells (HVEWs) will be installed to extract vapors under vacuum and routed to a vapor treatment system. The vapor treatment system consists of multiple sequential treatment components to condition the vapor prior to vapor phase granular activated carbon (VGAC) adsorption prior to discharge. Condensed water from the vapor stream will be treated with liquid phase granular activated carbon (LGAC) treatment prior to discharge to the sanitary sewer.

The objective of the TCH system is to reduce concentrations of each of the site-related contaminants of concern (COCs): TCE, cis-1,2-dichloroethene (cis-1,2-DCE), 1,1-dichloroethene, 1,1,1-trichloroethane (1,1,1-TCA) and 1,1-dichloroethane, in soil within the TTZ to 1 mg/kg.

2 BASIS OF DESIGN

This section summarizes Site information provided by GHD including the Site background, geology, and hydrogeology. It also defines the TTZ based on existing Site data and establishes remediation goals and objectives that together serve as the basis of design for the project.

2.1 Overview of In Situ Thermal Approach

ISTR is being implemented to address current and potential future risks associated with the COC impacts to soil and groundwater at the Site. The specific form of ISTR being used is TCH. TCH is a heating technique whereby electric heaters placed inside steel casing generate heat which transfers to the formation by thermal conduction, driven by temperature gradients. COCs will be extracted as vapor and liquid (condensate) and will be treated in a vapor and liquid treatment system prior to vapor discharge to the atmosphere and liquid discharge to the sanitary sewer.

2.2 ISTR Performance Goal

The objective of the TCH system is to meet the site-specific target level of 1 mg/kg for each of the Site COCs.

2.3 Site Background

The Site is located 1130 Niagara Street Site, Buffalo, New York. Parcel 1 is presently covered by concrete that was the foundation of a warehouse (now demolished). There are no known active subsurface utilities on Parcel 1, although some abandoned gas, water, and sewer piping may be present. Parcel 2 is presently covered by grass that slopes from east to west. There are no known active subsurface utilities on Parcel 2, although some abandoned gas, water, and sewer piping may be present. The Site and immediate surroundings are zoned Urban Industrial. Brief descriptions of the immediate surroundings are as follows:

- To the north is Gull Street, and “Parcel 3” which consists of a black top parking lot.
- To the west is Interstate 190 and the Niagara River.
- To the south is an inactive machine manufacturing building.
- To the east is Niagara Street.

A review of historical information indicates that the warehouse building was constructed between 1925 and 1927 and portions of the Site have been in industrial use since prior to 1889. The Site was purchased in 1960 by Curtis Screw for manufacturing and metal machining. Reportedly, it was during Curtis Screw’s ownership and use of the Site that TCE and 1,1,1-TCA degreasers were used, and the solvents were released to the environment. The property was sold to Gerspach Properties in 2005. Jenesis purchased the Site in 2015.

2.4 Target Treatment Zone

The TTZ has been defined as the zone where TCE concentrations are greater than 1 mg/kg. We have divided the TTZ into eight Subareas, Subareas A-H (as shown in Figure 2.1), defined by the surface elevation and depth to bedrock in each Subarea. In the central portion of the TTZ (Subareas D, E, F and H) the bottom of the TTZ extends 10 feet (ft) into the underlying bedrock, while the TTZ in all perimeter areas extends 5 ft into the bedrock. Subareas G and H encompass Parcel 1 and Subareas A, B, C, D, E, and F encompass Parcel 2. Plan view extents of the Subareas are shown in Figure 2.1 and a summary of the Subarea dimensions is provided in Table 2.1.

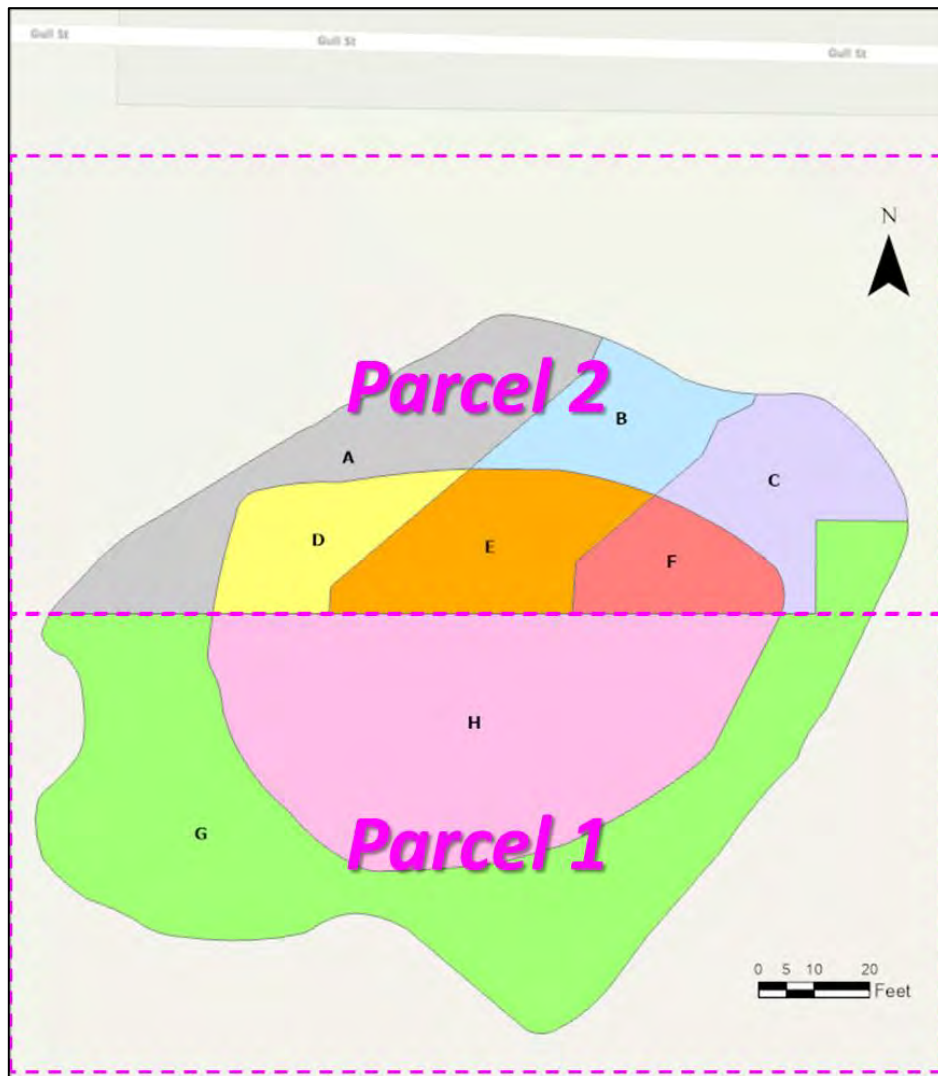


Figure 2.1. Treatment Subareas A-H

Table 2.1. Treatment Subarea Definition Summary

Treatment Subareas			Treatment Depth	Treatment Volume
Area (Square Feet [ft ²])			(ft bgs)	Cubic Yards (cy)
G (Parcel 1)	4,366	7,988	22.0	3,557
H (Parcel 1)	3,622		27.0	3,622
A (Parcel 2)	1,442	5,261	15.0	801
B (Parcel 2)	692		17.0	435
C (Parcel 2)	879		19.0	618
D (Parcel 2)	670		20.0	496
E (Parcel 2)	1,004		22.0	818
F (Parcel 2)	575		24.0	510
Total		13,249		10,859

As summarized in Table 2.1, the total treatment area is 13,249 ft² and the total treatment volume is 10,859 cy. Note that while some reductions in COC concentrations may be observed outside the TTZ, full treatment will only be achieved within the TTZ footprint described above.

2.5 Geology and Hydrogeology

Three main geologic layers exist in the TTZ. The first layer is a fill that consists of sand, clay, and gravel with brick fragments, wood, and cinders. The fill layer extends from the ground surface to 5 – 6 ft bgs in Parcel 1, and from ground surface to 4 ft bgs in Parcel 2. Underneath the fill layer, there is a native silty clay layer that is approximately 10 – 11 ft thick in Parcel 1, and 0 – 10 ft thick in Parcel 2. Below the native silty clay is the Onondaga Limestone. This bedrock layer is found from 10 – 17 ft bgs throughout the Site, based on the bedrock contour map and surface elevations provided.

The water table at the Site is located in the fill layer, generally from 1 – 7 ft bgs depending on location and flows to the west. The groundwater gradient is approximately 0.03 feet per foot (ft/ft). Hydraulic conductivity values were not provided so values from *Basic Ground-Water Hydrology* were used for this evaluation (Heath, 2004). The hydraulic conductivity of the combined overburden consisting of surficial fill and the native silty clay is 5.0×10^{-2} feet per day (ft/day) (1.8×10^{-5} centimeters per second [cm/s]) while the Onondaga Limestone Bedrock is assumed to have a hydraulic conductivity of 7.0×10^{-3} ft/day (2.5×10^{-6} cm/s).

2.6 Contaminants of Concern and Mass Estimate

The maximum concentrations of TCE detected in groundwater at the Site is 280,000 micrograms per liter (µg/L) and in soil is 3,400,000 micrograms per kilogram (µg/kg). TerraTherm estimated a

total COC mass of 6,972 pounds (lbs) based on the average concentrations provided for each COC and applied to the total treatment volume. Table 2.2 summarizes the mass estimate, soil and water maximum detections, average concentrations, and target level.

Table 2.2. Summary of COCs Mass Estimate, Maximum Detection and Target Level

COCs	Mass Estimate (lbs)	Groundwater (µg/L)			Soil		
		Max Level Detected	Average	Target Level	Max Level Detected (µg/kg)	Average µg/kg	Target Level mg/kg
TCE	6,972	280,000	46,300	NA	3,400,000	197,000	1.0
Cis-1,2-DCE		82,000	6,900	NA	5,300	520	
1,1-Dichloroethene		43,000	3,900	NA	190,000	13,300	
1,1,1-TCA		490,000	30,900	NA	7,900,000	166,000	
1,1-Dichloroethane		3,700	500	NA			

3 THERMAL TECHNOLOGY BACKGROUND

3.1 Technology Overview

TCH will be implemented to remediate TCE, cis-1,2-DCE, 1,1-dichloroethene, 1,1,1-TCA, and 1,1-dichloroethane at the Site. A conceptual sketch of a TCH remediation process is shown below in Figure 3.1.

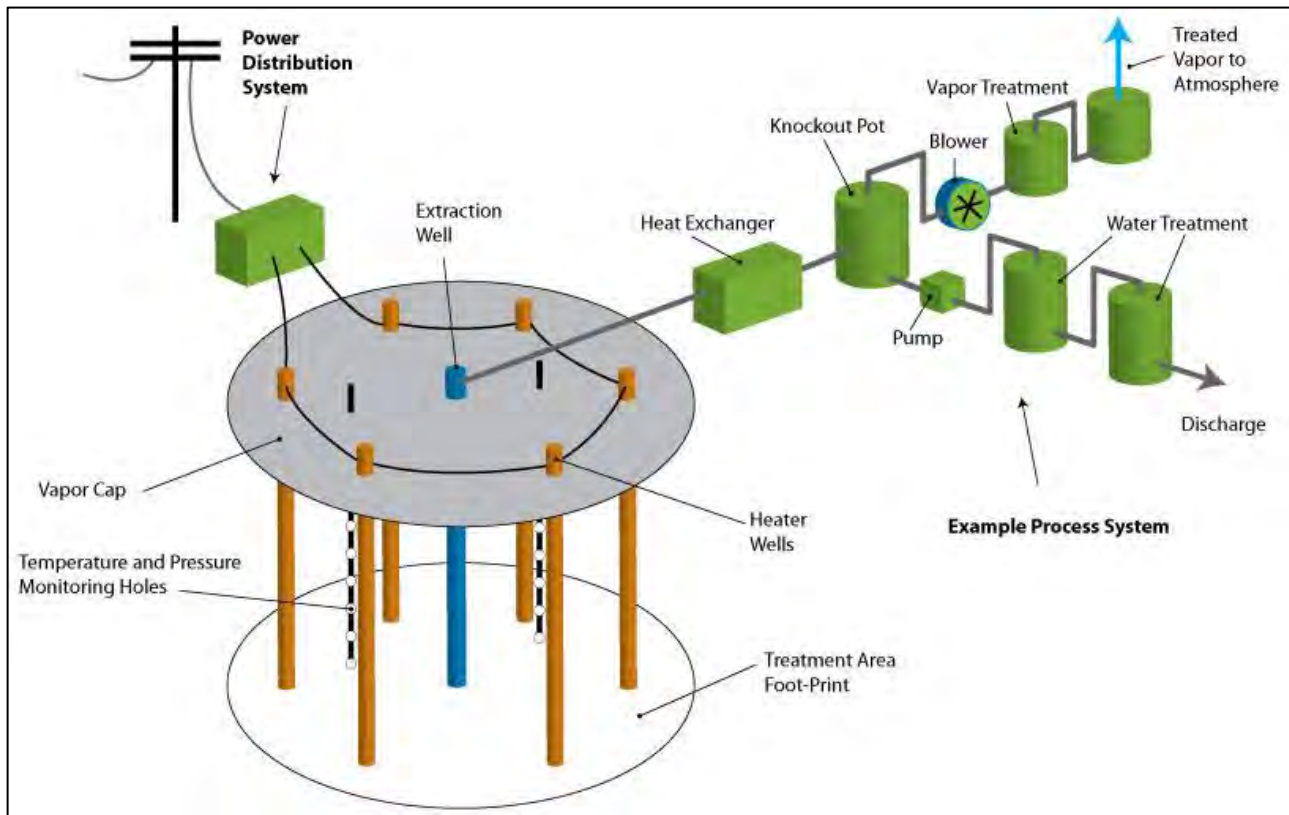


Figure 3.1. Sketch of Thermal Remediation Process (example only)

The heating system is supported by an extraction, condensing and treatment system, that includes:

- HVEWs to extract vapors from soil;
- Heat exchangers to cool recovered contaminant vapors;
- Liquid/vapor separator (knockout pot);
- Vacuum blower to transfer steam and vapors from the extraction wells to the treatment system;
- Liquid treatment system;
- Vapor and liquid treatment utilizing VGAC/LGAC;
- Conveyance pipe;

- Valves, gauges, and sensors to control and monitor recovery and treatment operations; and,
- Electrical power distribution equipment and infrastructure.

An office trailer will be used for housing data management computers and other monitoring equipment. The process is automated with a TerraTherm operator overseeing the system and collecting data and samples. As the Site is heated, fluids are extracted, cooled, separated, and treated. The subsurface process is monitored using temperature sensors and sampling and analysis of subsurface fluids.

3.2 Thermal Conduction Heating Background

TCH is a field-proven remediation technology that has been successfully used to remediate the full range of volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) (Stegemeier & Vinegar, 2001). TCH has been utilized at over 75 sites across the U.S. and worldwide and is a viable treatment technology for nearly all VOCs including chlorinated volatile organic compounds (CVOCs) such as TCE as present at the Site. TCH is particularly well suited for application in low permeability soils and bedrock because heat distribution is not affected by the low hydraulic conductivity of the soil and bedrock matrix. The TCH process is described as follows:

1. Thermal energy provided by vertical heater borings will heat the soil, water, and contaminants. The heating progresses by thermal conduction, as the heater wells are heated to temperatures around 500 to 600°C, creating significant temperature gradients in the formation around each heater. Thermal conductivity of soil materials varies over a very narrow range – only by a factor of 3 to 5; therefore, TCH is very precise and predictable regardless of the permeability of the soil and bedrock or its degree of heterogeneity. Concrete debris and structures that are known to be present at the Site will not pose any technical heating challenge for the TCH technology.
2. The heat front moves away from the TCH heaters through the soil by thermal conduction and convection, and the superposition of heat from the many heaters results in a temperature rise throughout the TTZ.
3. As soil temperatures increase, contaminants and water contained in the soil matrix are vaporized. While locations close to heaters (i.e., typically less than 1 ft) may achieve temperatures above the boiling point of water (100°C), locations in between heaters need only achieve temperatures near 100°C to accomplish steam distillation for effective removal of CVOCs including TCE. Boiling off all the soil water is not necessary. Very high (>99%) removal results have been repeatedly measured for ISTR of CVOCs like TCE.
4. The vacuum applied to the HVEWs from the process system will draw the vapors through the soils and into the off-gas piping network for subsequent treatment.

The heater borings are 3.0-inch inner-diameter (ID) steel cased wells (3.5-inch outer-diameter), equipped with a stainless-steel liner, housing thermal conduction heaters. Each of these contains a stainless-steel heater as shown in Figure 3.2.

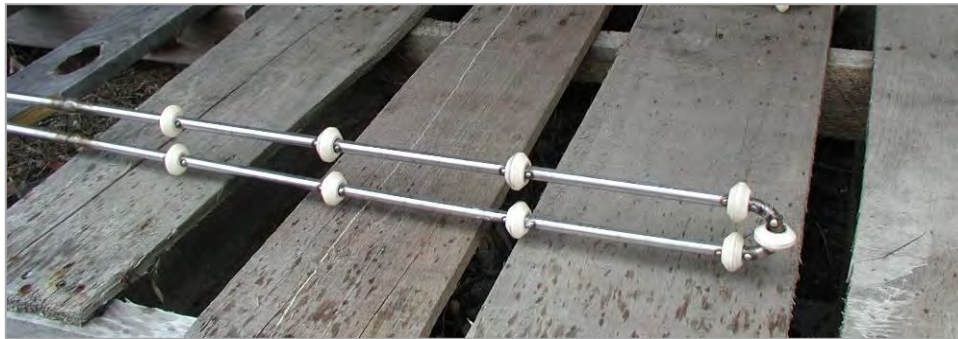


Figure 3.2. TerraTherm Heater Element

The metal rod has a diameter of approximately 0.5 inches (in). The white beads are ceramic isolators. Electric power flows through the steel rod, causing it to heat resistively. Figure 3.3 shows an example of a full scale TCH wellfield. Each heater is connected by a heavy-duty portable power cord through an electrical junction box.



Figure 3.3. Example TCH Wellfield (not specific to actual site)

The annular space between the carbon steel casing and the borehole wall will be filled with permeable sand along the central portions of the heater wells. This sand will extend 5 to 10 feet into the top of bedrock, depending on the vertical extent of treatment, and facilitate transport of volatilized COCs up to the vadose zone where they can be effectively removed from the TTZ by the HVEWs.

3.3 Remediation Mechanisms

3.3.1 Vaporization

The following describes how TCH will be used to treat COCs at the Site by heating the subsurface to near the boiling point of water (100°C). Heating the TTZ to the boiling point of water ensures that VOCs (like TCE) become volatile and partition into the vapor phase for extraction. The effectiveness of the TCH technology results from changes in the thermodynamic conditions in the subsurface during heating. The primary characteristic leading to effective thermal treatment is contaminant vaporization whereby a reduced boiling point is observed for non-aqueous phase liquid (NAPL)/water mixtures of site contaminants in situ. Figure 3.4 illustrates changes to physical properties as temperatures increase (below for tetrachloroethene [PCE] and TCE). As depicted, vapor pressure and Henry's Law constants increase dramatically as temperatures rise, allowing contaminants to vaporize below their characteristic boiling points.

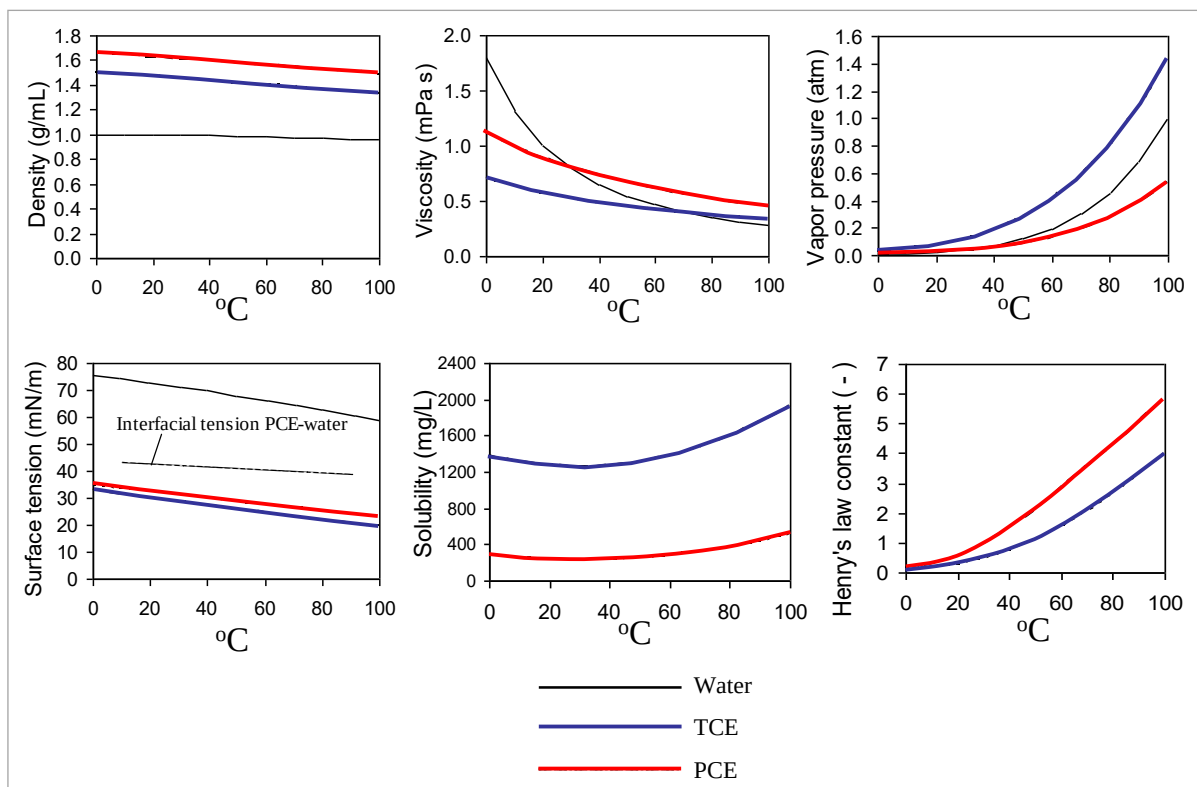


Figure 3.4. Physical Property Changes as a Function of Temperature (Heron, Baker, Bierschenk, & LaChance, 2006)

Vaporization is further illustrated in Figure 3.5 in which two images of the same porous medium show a comparison of heated and unheated pore water. The left image is at ambient temperature and the right image is at boiling temperature. Contaminant vaporization is illustrated by comparing the lighter areas (gases in the pore space) between the two pictures. The observed

increase in gas volume as temperature is increased, demonstrates how boiling temperatures lead to steam formation. The continuous gas phase in the image to the right depicts the boiling of pore fluids and the creation of steam. The steam is rich in contaminant vapors, under pressure, and inclined to move out of the pore matrix toward the extraction locations.

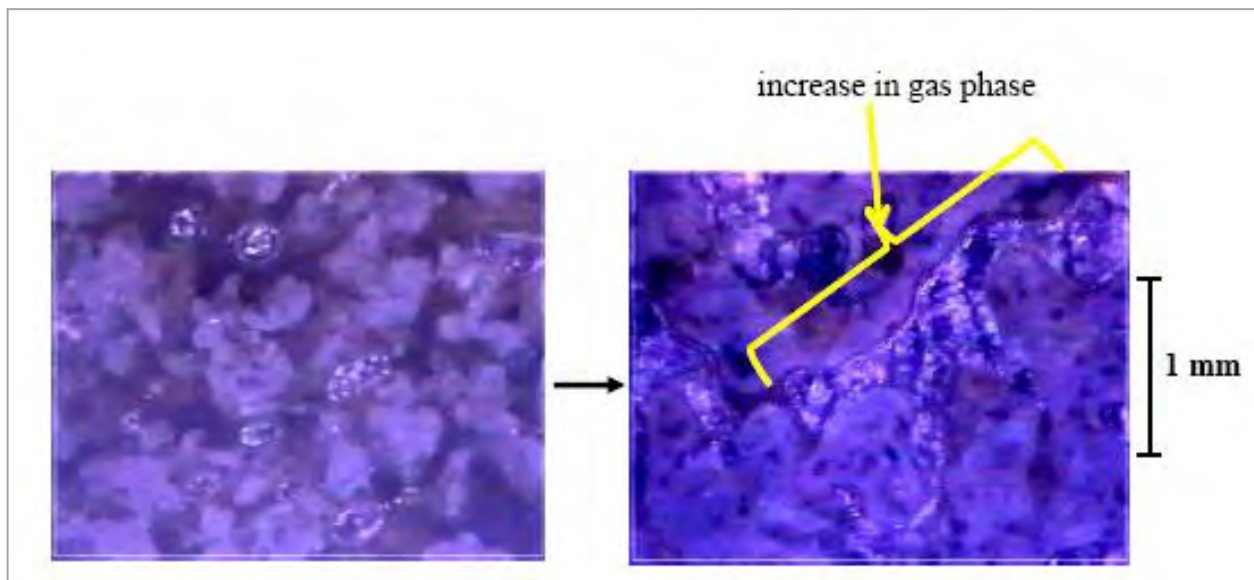


Figure 3.5. Ambient vs. Boiling Temperature Illustration, Pore-Scale

Similar mechanisms occur at NAPL-water interfaces where contaminant-rich steam is produced as a result of co-boiling and where the resulting buoyancy of the steam causes them to primarily migrate vertically to the vadose zone for removal. When heating the site COCs, the following occur:

- The vapor pressure of the COCs dramatically increases with temperature. As the subsurface is heated from ambient temperature to temperatures in the range of 100°C, the vapor pressure of the COC constituents will typically increase between 10 and 30-fold (Udell, 1996).
- Adsorption coefficients are reduced moderately during heating, leading to an increased rate of desorption of COCs from the soil (Heron, Van Zutphen, Christensen, & Enfield, 1998).
- Boiling of DNAPL occurs at temperatures below the boiling point of water (DeVoe & Udell, 1998). Heating the subsurface to 100°C will make the DNAPL thermodynamically unstable, causing it to boil and convert to a vapor. The vaporized DNAPL components will be captured in the HVEW system and be transported to the effluent treatment system prior to discharge.

- Fugitive emissions will be prevented by maintaining negative pressures at the wellheads and where possible across most of the TTZ through operation of the HVEW system. In addition, all vapor collection piping will be operated under a net negative pressure. A backup generator is included in the system design to operate the vapor extraction system in the event of a power outage.

Other remediation mechanisms that will be provided by the TCH approach include accelerated desorption from the solid phase, thermal destruction via in situ reactions near TCH heating elements, and microbial mineralization (Baker & Kuhlman, 2002).

4 PROJECT PERSONNEL

TerraTherm's project team is shown below in Figure 4.1. TerraTherm's project management approach consists of assigning a Project Manager, Project Engineer and Site Superintendent who are supported by the members of our technical, engineering, and administrative staff, as needed (see Figure 4.1).

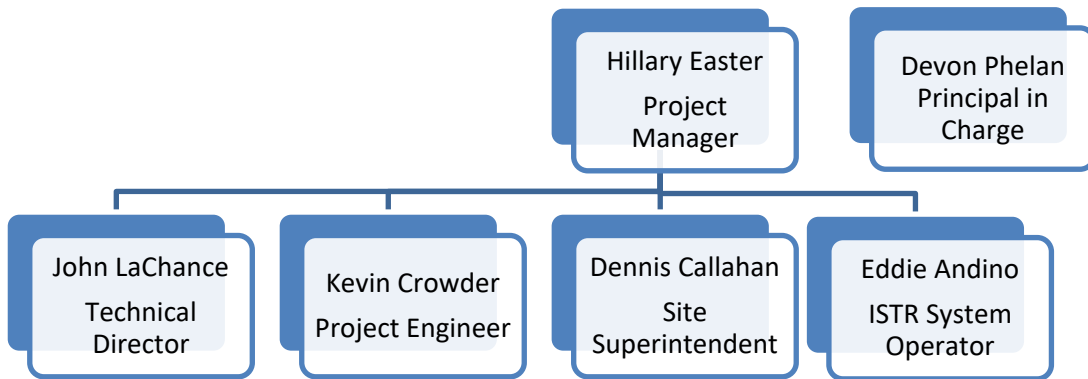


Figure 4.1 Project Organization Chart

TerraTherm plans to staff the construction of the ISTR system with one Site Superintendent and two field technicians working six days per week (7:30 AM-4:30 PM Monday through Friday and typically a shorter day on Saturday).

TerraTherm will have at least one full-time operator assigned to the Site. The operator's typical on Site working days will be Monday through Friday with weekend system checks as needed. In addition, the operator will respond to system alarms 24 hours a day, seven days a week. TerraTherm's operational personnel rotate home one week for every four weeks worked. As such, there will be at least one week per month where the operators will overlap.

During demobilization, TerraTherm will have three TerraTherm personnel that will work six days per week (7:30 AM-4:30 PM full-time Monday through Friday and typically a shorter day on Saturday).

5 THERMAL SYSTEM DESIGN

The Site consists of multiple zones with different soil properties (porosity, saturation, groundwater flux). Numerical water and energy balance models have been developed by TerraTherm to simulate the addition, removal, and loss of energy in each layer of the Site separately with the layers exchanging both fluids (water and steam) and energy along their boundaries. The calculations also estimate heat losses along the top, sides, and bottom of the TTZ and the impact of groundwater flow into the treatment area, such that total energy demands, and the duration of thermal treatment can be estimated.

Numerical water and energy balance calculations were conducted to evaluate the best heating approach for the Site. The numerical calculations were performed to evaluate the effects of groundwater flux, TCH power input, heater design and heating strategy. The water and energy balance calculations are referred to as the model. The basic model setup is described in the following sections.

5.1 Description of Numerical Model

The model is based on simplified mass and energy balance principles relevant for TCH operation. The model can include up to twelve layers each with different model input and derived parameters including:

- Surface area;
- Depth;
- Area of perimeter;
- Porosity;
- Initial saturation;
- Initial bulk density;
- Initial heat capacity; and,
- Initial thermal conductivity.

During the simulations, parameters such as thermal conductivity and heat capacity are changed automatically as the water saturation changes based on published equations for these parameters. This means that as a zone is drying out due to boiling and steam removal the water saturation is reduced. Therefore, both the heat capacity and thermal conductivity are reduced such that only the remaining water contributes to these parameters. This gives a more realistic heating prediction than if constant values are assumed.

The results of the numerical simulations have served as the basis for the design of the thermal treatment system at the Site. The model calculates the water mass balance for each layer. We assumed water infiltration from the surface into the TTZ was negligible for the Site.

Representative soil porosities of 46% for the surficial fill, 41% for the native silty clay, and 5% for the Onondaga Limestone were used in this evaluation. The model assumes heating starts at 0 ft bgs and extends to 5 ft below the bottom of the TTZ. Extending the heated zone below the TTZ helps to keep hot steam migrating upward and helps to offset heat losses towards the top and bottom of the TTZ.

Hydraulic conductivity values were not provided so values from *Basic Ground-Water Hydrology* were used for this evaluation (Heath, 2004). The hydraulic conductivity of the combined overburden consisting of surficial fill and, the native silty clay is 5.0×10^{-2} ft/day (1.8×10^{-5} cm/s), and the hydraulic conductivity of Onondaga Limestone Bedrock is 7.0×10^{-3} ft/day (2.5×10^{-6} cm/s). A gradient of 0.03 ft/ft was used in the model.

The steam extraction rates were calculated based on the energy injected by the TCH system. The equation calculating the ratio between injected energy and extracted steam is derived based on observations made on several recent full-scale TCH projects. Cumulative energy added to the Site is calculated as a summation of enthalpy fluxes:

- Energy added by the TCH heaters;
- Energy extracted as steam in the vapor stream;
- Energy extracted in the entrained liquid stream (if any); and,
- Heat loss to the areas outside of the heated zone.

The energy removed as a non-condensable vapor at any given time is relatively small due to the low heat capacity of air in relation to steam and water and is therefore ignored in the calculations.

The actual heat loss cannot be calculated accurately. An estimate can be made based on thermal profiles at the bottom and top of each layer and along the perimeter. For the heat loss through the top, bottom and sides, the temperature difference between the perimeter of the Site and the ambient soil is used to calculate the thermal gradient. For the calculations, it is assumed that the ambient soil surrounding the TTZ remains near ambient temperatures.

All heat migration through the sides and through the top and the bottom layer of the model are considered lost from the model domain. Heat migration from the bottom of a layer and into the top of the underlying layer remains as energy in the model if both layers are in the heated zone. The model calculates average layer temperatures based on the energy balance and the estimated heat capacity of each layer.

5.2 Simulation Results

The Site definition and numerical modeling results are further described in the thermal model simulation report in Attachment A.

5.2.1 Temperature Progression and Duration

Figure 5.1 shows the predicted average temperature in the TTZ as a function of time.

Based on the energy calculations, the predicted total duration of the remedy is estimated to be 197 days. Please note that the figure below represents the average Site temperature. During operation, the Site temperature will be observed at the centroid locations between the heaters (i.e., the coolest locations). Thus, the observed temperature progression is expected to lag behind the modeled temperatures by up to 2-3 weeks.

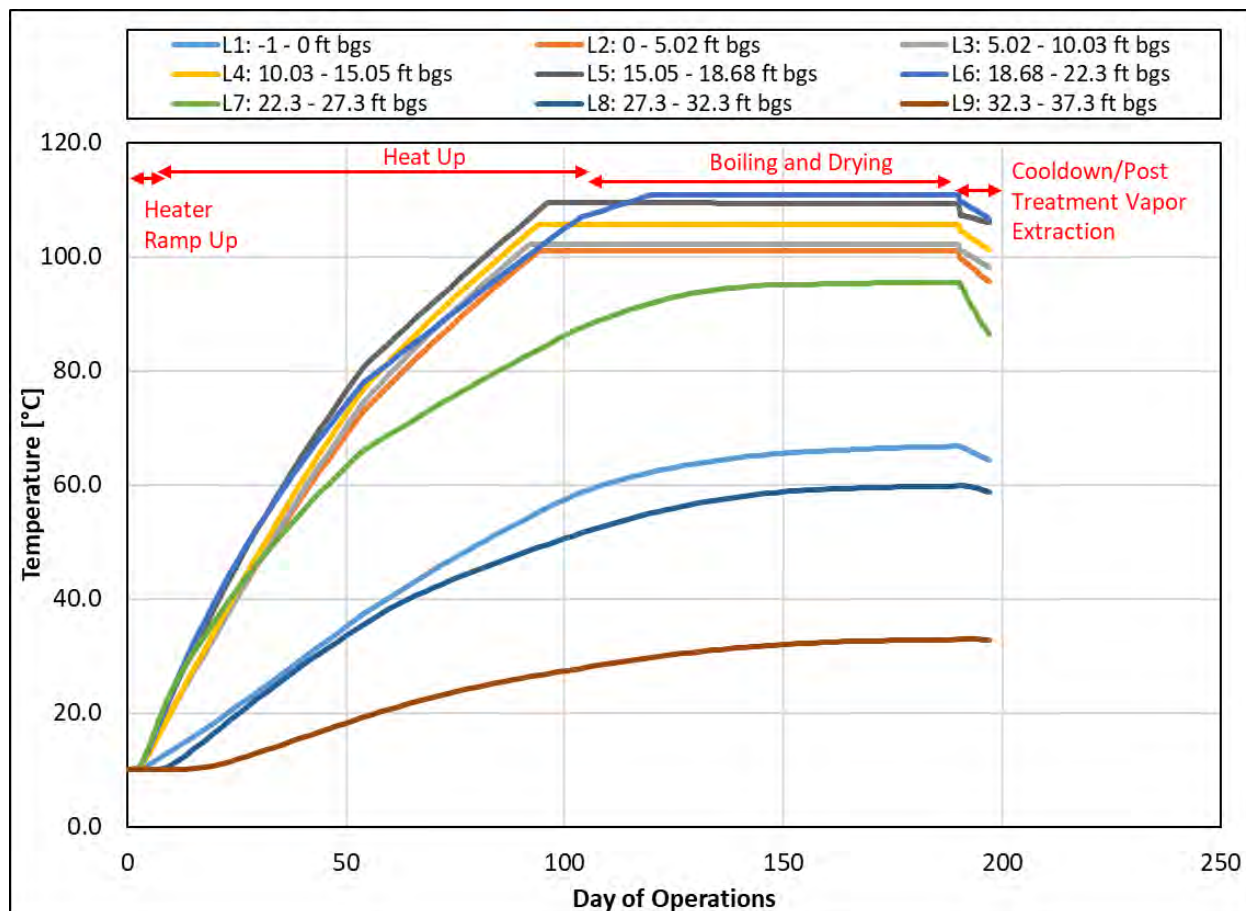


Figure 5.1. Modeled Average Temperature Curves (Layers 1 to 9) during Thermal Treatment¹

The results of the simulation indicate that on average the TTZ (Layers two through seven) reaches a temperature of the boiling point of water between days 90 to 120. In reality, there is a delay between the modeled average temperature and the temperature observed at the centroid locations. Thus, the boiling point is expected to be reached approximately 110-140 days after

¹ Note: Layer 1 is above the TTZ, Layers 2-7 are within the TTZ and Layers 8 and 9 are below the TTZ. Please see further definition of the model treatment layers in the thermal model simulation report in Attachment A.

startup of operation at the centroid locations, represented by the temperature monitoring points installed at the Site.

The operational durations for the Site have been estimated based on the model calculations. The operational sequence and durations are shown in Table 5.1.

Table 5.1. Operational Phases and Durations

Operating Time	Number	Unit
Heater ramp up	1	Days
Heating to boiling and boiling*	189	Days
Post treatment vapor extraction	7	Days
Total operating time	197	days

*Note: These heating phases will occur simultaneously within different portions of the TTZ

The estimated total period of TCH operations is approximately 197 days (approximately 6.5 months), including 1 day of heater ramp up and 7 days of post-treatment vapor extraction and initial cool-down. The heat-up period required to raise the soil temperatures from ambient to the boiling point of water is approximately 90 to 120 days.

During heat-up, the percentage of the TTZ that is boiling will progressively increase until the entire TTZ reaches the boiling point (90 to 120 days). Heating will continue until day 190, after which the soil within the TTZ is expected to have achieved the soil cleanup goals and the heaters will be turned off. During heat-up and the boiling period, steam and volatized COCs will be extracted from the TTZ and sent to the treatment system. The TCH system is operated with the objective of optimizing the subsurface heating and COC removal process. The operational plan is flexible, allowing for adjustments based on observed hydraulic responses, heating progression, and COC extraction rates.

Once the heating system is shut down, the Site immediately begins to cool. In the cooldown phase, temperatures decrease below boiling, and any steam present in the subsurface will condense and decrease in volume by a factor of approximately 1,600 times due to the phase change from vapor to liquid. This phase change will subsequently create an inward gradient into the TTZ. Proper cooldown is documented by verifying that at least the upper five feet of the soil column has temperatures below steam temperature. The upper five feet of the soil column acts as an effective buffer zone to quench any steam migrating upwards and the vapor cap will act as a vapor barrier while temperatures continue to subside during the initial stages of decommissioning. Additionally, vapor extraction will continue to operate until temperatures in the upper five feet of the soil column are below steam temperature, even if this duration is outside the estimated seven days noted in Table 5.1. While subsurface temperatures at the Site will remain elevated for anywhere

from 12 to 24 months following ISTR, once the criteria outlined above have been met, complete ISTR system shut down will occur.

5.2.2 Effluent Treatment System Design Parameters

The subsurface energy balance calculations in the numerical model are used to calculate values for the vapor extraction rates necessary to maintain capture and optimize the treatment. Table 5.2 presents the wellfield vapor and liquid design parameters resulting from the numerical model calculations. Based on the calculated values, the vapor treatment system has been designed to treat an influent wellfield flow rate of approximately 740 standard cubic feet per minute (scfm) (combined condensable and non-condensable flow). The liquid treatment system has been designed to treat a minimum of 1.9 gallons per minute (gpm) of condensate and 0.4 gpm of entrained wellfield water.

Table 5.2. Design Basis, Wellfield

Wellfield Vapor	Number	Units
Wellfield vapor extraction rate, max total	740	scfm
Wellfield non-condensable vapor, max	400	scfm
Wellfield condensable vapor (steam), max	330	scfm
Wellfield Liquid		
Wellfield steam extraction rate, when condensed, maximum	1.9	gpm
Wellfield water entrainment, maximum	0.4	gpm
Total liquid extraction rate	2.3	gpm

5.3 Wellfield Design and Installation

Heaters will extend five feet below the TTZ to ensure target temperatures are reached at the bottom of the TTZ. To limit any risk of condensation of mobilized COCs above the TTZ, heating will be extended to 0.5 to 1 ft bgs. By doing so, a heated vadose zone is created at the top of the TTZ and above the water table, allowing for proper contaminant vapor capture.

The ISTR wellfield includes the following:

- Heaters spaced approximately 14-15 ft apart along the perimeter of the Site. The interior heater spacing is approximately 16-17 ft. A total of 80 heaters will be installed at the Site.
- The heated depth begins at the surface across the TTZ. The heater can is installed to approximately six feet below the TTZ to allow for thorough heating across the bottom of the TTZ and thermal expansion of the heaters during the remedy.
- 18 HVEWs will recover vapors and direct them to the vapor treatment system.
- Subsurface temperature will be monitored from eight TMPs.
- Subsurface pressure will be monitored from four perimeter PMPs.

Table 5.3. Boring Summary

Treatment Subarea	Heater Quantity	HVEW Quantity	TMP Quantity	PMP Quantity	Vapor Extraction Well (VEW) Quantity
A	9	2	-	-	-
B	4	1	1	-	-
C	5	-	1	-	-
D	3	2	1	-	-
E	5	1	-	-	-
F	4	1	-	-	-
G	26	7	2	-	-
H	24	4	3	-	5
Perimeter	-	-	-	4	-
Total	80	18	8	4	5

The well and boring types and functions are summarized below:

- Heater Borings:** These borings supply heat by thermal conduction from the ground surface to 5 ft bgs into bedrock in Subareas A, B, C, and G, and from ground surface to 10 ft bgs into bedrock in Subareas D, E, F, and H. The heaters are installed using a 4 in x 6 in rotonsonic system (advance outer casing and then inner core barrel) with a high temperature grout plug installed in the annular space in the lower 6 ft of the bedrock interval to prevent any downward contaminant migration between heater installation and the time the heating system is activated. Above the bedrock, the annular space will be backfilled with sand to provide a vertical pathway for steam and COC vapors to migrate up to the vadose zone for capture and removal by the HVEW system. The annular space of the upper 2 ft of the heater boring will again be filled with a high temperature grout plug to prevent direct vapor migration along the heater can through the vapor cover and into the atmosphere.
- HVEWs:** The HVEWs will consist of a 4-inch stainless steel screen with a 2 in carbon steel riser pipe. The screens will be installed in a trench approximately 1 ft deep by 1 to 1.5 ft wide and backfilled with clean washed stone. An approximately 3-in layer of dense grade aggregate will be placed in each trench towards the surface to protect the permeable backfill material around the HVEW screens.
- VEWs:** These wells will be installed in the historic drain pit locations to allow for adequate extraction. These wells will consist of 2-inch stainless steel screen with a 2-in carbon steel riser pipe. The screens will be installed using a 6 in core barrel to 7 ft bgs. The screen will

be set at 6 ft bgs and backfilled with sand to 6 inches bgs with a grout plug to surface.

- **TMPs:** These wells will consist of a 1.5 in pipe instrumented with thermocouples every 3 ft in the vertical interval from the top to the bottom of the TTZ to enable monitoring of heating progression. The boring will be backfilled with high temperature grout to prevent any steam migration up along the monitoring point.
- **PMPs:** These monitoring points will be installed outside of the TTZ footprint and will be utilized to monitor any pressures and vapor migration along the TTZ perimeter. A 1-in diameter screen will be installed approximately 3-5 ft below the concrete or ground surface and used for frequent pressure monitoring during operations. The annular space will be backfilled with sand around and immediately above the screen, while a high temperature grout plug will seal the point towards the surface.

5.3.1 Vapor Cover

Since the top of treatment starts at ground surface in all treatment Subareas an insulated vapor cover will be constructed across the TTZ. The insulated vapor cover will ensure that the target temperature is both reached and maintained throughout the treatment zone, including the vadose zone, to reach the relatively low remediation standards defined for the Site. The vapor cover minimizes heat losses at the ground surface and will ensure proper treatment of the upper portion of the areas and prevent any shallow condensation of volatilized COCs in the shallow zone. Furthermore, the vapor cover will prevent surface water from infiltrating into the TTZ during thermal operations.

The vapor cover proposed by TerraTherm will have a minimum R-12 insulation value. High temperature insulation boards will provide the primary insulation for the cover. A thin concrete layer (three inches of concrete) will be constructed as the top layer to serve as a vapor seal and weather barrier and to allow for foot traffic in the wellfield during the remediation.

For Parcel 1, the existing concrete slab will serve as the base layer. Three inches of insulating foam board will be placed over the concrete slab overlying the treatment area and extending approximately 10 ft outside of the treatment area perimeter. A finish layer of three inches of concrete will be placed over the foam board to complete the cover and provide a suitable durable working surface.

For Parcel 2, a three-inch layer of concrete will be poured over the existing ground surface within the treatment area and extend approximately 10 ft outside of the treatment area perimeter. Three inches of insulating foam board will then be placed over the concrete base layer. A finish layer of three inches of concrete will be placed over the foam board to complete the cover and provide a suitable durable working surface.

Rigid insulation will be anchored to the retaining wall using pressure treated lumber and plywood. This will minimize heat losses along the face of the retaining wall.

5.3.2 Drilling and Well Installation Methods

Vertical ISTR wells will be installed by Rotosonic drilling methods. Sonic drilling is the preferred method to achieve optimal drilling production rates with sufficient power to install the wells to the required depths (including through unconsolidated materials and into bedrock). This drilling approach greatly reduces the volume of cuttings generated as compared with hollow stem auger drilling and has been used successfully at other thermal remediation sites. After achieving the desired final borehole depth, the well or monitoring point will be installed according to the design specifications for the particular type of well as the casing is withdrawn. This construction method was selected for three primary factors: first, it minimizes the potential for contaminant migration within the borehole during well construction; second, it minimizes waste; and finally, this method accelerates the drilling process, even at sites with difficult drilling conditions.

5.3.3 Drilling Waste

Drill cuttings produced during installation of the wellfield components (heater borings, HVEWs, temperature monitoring points and pressure monitoring points), will be collected and temporarily stockpiled on the Site until wellfield installation is complete.

Approximately 40 cy of drill cuttings are expected to be generated during the well installation process, including the excavated soils from the HVEW installation. Cuttings will be stockpiled on and covered by a high-density polyethylene liner during well installation. Once well installation is complete, the cuttings will be spread over Parcel 2 prior to the installation of the vapor cover. The soil cuttings will be treated thermally with the remainder of the TTZ.

5.4 Mechanical and Electrical Installation

With the temporary nature of the thermal treatment system, the heaters and HVEWs are constructed as aboveground completions for ease of operation and maintenance. The proposed locations for mechanical and electric equipment are shown on the Mechanical Layout drawing in Attachment B. Vapor and liquid manifold piping will be installed on the ground and/or on unistrut (or similar) pipe stands. Vapor and liquid piping will consist of fiberglass and carbon steel pipe. Connections to the individual wells will be made with temperature and chemical rated hose connections to allow enough flexibility for thermal expansion during operation.

TerraTherm will establish a new electric service with National Grid for power distribution to the TCH system. TerraTherm's subcontracted licensed electrician will obtain all necessary permits. For the electrical infrastructure, TerraTherm will provide a skid-mounted portable switchboard with National Electrical Manufacturers Association (NEMA) 3R (outdoor, weatherproof) rated equipment to serve as the main electrical service connection point. The system will be designed

and factory-tested in accordance with applicable American National Standards Institute (ANSI), NEMA, UL and Institute of Electrical and Electronics Engineers (IEEE) standards.

TerraTherm and a subcontracted licensed electrician will run secondary conductors from the 5,000 amp (A) main switchboard to downstream panel boards that feed the effluent treatment system components as shown on the Electrical Single Line Drawing (E101) in Attachment A. The majority of the electrical panel boards and effluent treatment equipment proposed for use on this project are skid-mounted and portable. Due to the temporary nature of the project, the majority of the equipment connections will be made using extra hard duty rated portable power cords (e.g., Type W cord, Type G cord, “mining cable”) and other portable cords (e.g., Type SOW) suited for outdoor use in wet environments. All equipment will be installed, wired, and commissioned in accordance with the National Electrical Code.

5.4.1 Temporary Facilities and Laydown Area

Temporary facilities and material laydown areas will be set up to support Site construction/operations, including a construction trailer, storage container, portable toilet, handwash, etc.

5.5 Process Design

A Process Flow Diagram has been developed based on the system design and is included as Drawing P101 in Attachment B. The treatment equipment has been sized based on the heat capacity and energy balance data, as well as the thermal model output described in this document. Select mass and energy balance parameters are listed in Table 5.4. Note that despite conditioning to the vapor stream, some condensable flow will make its way through the treatment system to the stack; therefore, the stack flow and non-condensable flow rates reported in Table 5.4 are not equal as the stack flow accounts for the estimated condensable flow that is carried through the treatment system.

Table 5.4. Selected Mass and Energy Balance Parameters

Parameter	Value
Expected wellfield vacuum, maximum	20 inches water column (“ w.c.)
Expected vapor extraction temperature	Up to 100°C
Anticipated vapor extraction flow rate (combined non-condensable and condensable vapor), maximum	740 scfm
Non-condensable Flow to carbon vessels	400 scfm
Total Flow at Stack	468 scfm
Collected condensed water from wellfield vapor stream	0.9 gpm

A Piping and Instrumentation Diagram (P&ID) has been developed and is included as Drawing P102 in Attachment B. The P&ID depicts the major system components, valves, instruments and controls, alarms, and sample ports as well as the basic component sizing information.

Programmable Logic Controller (PLC)-based control panels will monitor and control the system components based on flow, temperature, pressure and level inputs from instruments and sensors on the process equipment skids. The local control panels will report to a main PLC via a Modbus network, where the main PLC will log the system data.

In the event of an alarm or upset condition, the PLC where the alarm occurs will take immediate action and report the alarm to the main PLC, which will in turn initiate any other required actions on the other local control panels. The main PLC is equipped with dial out alarm capability to notify the system operator in the event of an alarm or upset condition. An interlock table that defines the alarm schedule will be provided in the Operations and Maintenance (O&M) Plan prior to the start of operations.

5.6 Vapor Extraction and Treatment System

The vapor treatment system's components are mounted within two containers with interconnecting piping. The system consists of the following major items (the tag numbers refer to the equipment designations shown on Drawing P102):

- Wellfield Condensate Collection Drop Leg (S-100)
- Condensate Knockout Tank (S-101)
- Caustic Supply System (T-301 and P-301A/B)
- Vapor Heat Exchanger (E-101A/B)
- Cooling Tower (W-451)
- Moisture Separator (S-102)
- Process Blowers (B-101A/B)
- Vapor Phase Carbon Vessels (VGAC-151-1/2/3)

5.6.1 Wellfield Condensate Collection Drop Leg (S-100)

Due to the elevation differences between Parcel 1 and 2, the vapor piping in Parcel 2 will be sloped toward the river. A condensate collection drop leg will be located at the bottom of the slope, allowing condensate generated in the vapor stream from the wellfield to drain into the drop leg. Condensed liquid collected in the drop leg will be pumped to the liquid treatment system using a double diaphragm pump.

5.6.2 Condensate Knockout Tank (S-101)

Vapors extracted from the wellfield pass through the vapor manifold and are drawn through a condensate knockout tank (S-101) to remove condensate. The condensate knockout tank is

equipped with an 8-inch diameter vapor inlet and 6-inch diameter vapor discharge nozzles. The top located vapor nozzle discharges to the duplex vapor heat exchanger assembly (E-101A/B).

Liquid collected in the tank will be combined with the moisture separator (S-102) liquid stream and transferred to the liquid treatment system. Air operated diaphragm pumps (P-201 A/B) are connected to the liquid effluent port. An interlocked air supply powers the pumps that evacuate the tank based on liquid level.

5.6.3 Caustic Supply System (T-301 and P-301A/B)

Because the design for this Site employs TCH to treat chlorinated solvents, there is a potential for hydrochloric acid (HCl) production in the process stream (HCl is a byproduct of the halogenated solvent oxidation process). A caustic solution may be required to neutralize the acid-laden vapors exiting the wellfield and entering the condensate knockout tank. A caustic supply system will be used to neutralize acid-laden vapors if HCl is generated. The caustic system will not be operated at system startup, though it may be activated, if necessary, based on the pH of vapors extracted from the wellfield entering the condensate knockout tank. If the caustic system is operated during operations, it will consist of two chemical feed pumps: P-301A/B will draw the caustic solution from the caustic storage vessel (T-301) and inject the caustic solution into the knockout tank. Under normal operating conditions, any HCl present in the vapor stream will condense in the vapor heat exchanger (E-101 A/B) and exit the system in the liquid phase; therefore, testing for HCl in the vapor phase is not deemed necessary and just the pH of the liquid phase will be assessed. If the pH drops below 3.5, the caustic supply system will turn on, and remain on, until the pH returns to neutral (i.e., pH 7). The actual amount of caustic that is required is directly dependent on the halogenated content of the mass of COCs extracted from the wellfield. HCl emissions are not anticipated during normal operation due to the immediate reaction between the caustic solution and HCl.

5.6.4 Vapor Heat Exchanger (E-101A/B)

After passing through the condensate tank (S-101), the vapors are processed in heat exchangers to cool and condense the incoming steam and reduce the moisture content of the vapor stream for the remaining steps in the process. The vapors entering the heat exchangers are cooled using a recirculating loop of water supplied by a cooling tower (W-451). The heat exchangers and cooling tower are designed to sufficiently reduce the temperature of the vapor stream to the point where the bulk of the moisture is removed from the wellfield vapors, and minimal COCs are removed via condensation. Both the vapor stream and cooling fluid side of the heat exchangers are instrumented with temperature indicators to allow adjustment of the recirculation loop flow to maintain proper moisture removal. The heat exchangers selected are designed to operate with cooling water supply at the worst-case summer cooling water temperatures. Spare capacity is included in the heat exchanger design.

5.6.5 Cooling Tower (W-451)

A cooling tower system will be used to provide non-contact cooling water for the vapor heat exchangers (E-101A/B) and the liquid heat exchanger (E-201). The cooling tower will have 200 tons of cooling capacity. The cooling tower unit will be capable of providing 165 gpm of 82 degrees Fahrenheit (°F) cooling water. The cooling tower includes a duplex circulator pump skid capable of the required flow, power panel, instrumentation, and controls.

5.6.6 Moisture Separator (S-102)

Following the heat exchanger, the cooled vapor stream and generated condensate will be drawn through a secondary moisture separator to remove free liquids and entrained liquid droplets. The condensate knockout tank is equipped with 6-inch diameter vapor inlet and discharge nozzles, as well as an integrated demister pad. The top located vapor nozzle discharges to the duplex process blower assembly (B-101A/B).

Liquid collected in the tank will be combined with the primary moisture separator (S-101) stream and transferred to the liquid treatment system. Air operated diaphragm pumps (P-202A/B) are connected to the liquid effluent port. An interlocked air supply powers the pumps that evacuate the tank based on liquid level.

5.6.7 Process Blower (B-101A/B)

The vapor process blowers are duplex regenerative type. The blower will supply the motive force (vacuum) needed to draw the vapors from the wellfield and through the off-gas treatment system. The vacuum that will be applied to the wellfield is expected to be relatively low, in the range of 20" w.c.

5.6.8 Vapor Phase Carbon Vessels (VGAC-151-1/2/3)

Three 5,000-lb VGAC vessels in series will be used to adsorb the COCs from the vapor stream. A 5,000-lb VGAC vessel will also be on standby at the Site for change-out purposes. It is anticipated that a total of 20,000 to 46,000 lbs of VGAC media will be used throughout the project. Anticipated changeout frequencies range from three weeks during average mass recovery rates to one week during peak mass recovery rates. The vessels will be plumbed in series and will be equipped with sample ports to monitor adsorption efficiency during operation. Piping between the vessels will include flanged hose assemblies to facilitate switching lead/lag positions and accommodate media change-outs. Expected emissions rates during peak operation are shown in Table 5.5, with hazardous air pollutant (HAP) compounds shown in bold.

Table 5.5. Expected Emission Rate of CVOCs at Peak Loading (HAPs Shown In BOLD)

Compound	Trigger Value	VGAC #1 Inlet		VGAC #1 Outlet		VGAC #2 Outlet		VGAC #3 Outlet		% Reduction	
	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr	lb/yr	Per Vessel	Total
Trichloroethene	5000	1.89	16554	0.37	3213	0.07	624	0.01	121	80.6%	99.3%
1,1,1-Trichloroethane	100	1.59	13949	0.30	2637	0.06	499	0.01	94.21	80.6%	99.3%
1,1-Dichloroethene	100	0.13	1118	0.04	348	0.01	108	0.00	33.65	68.9%	97.0%
cis-1,2-Dichloroethene	100	0.00	43.7	0.00	13.6	0.00	4.23	0.00	1.32	68.9%	97.0%
1,1-Dichloroethane	100	0.00	3.02	0.00	0.914	0.00	0.276	0.00	0.08	69.8%	97.2%
Vinyl Chloride	100	0.00	2.35	0.00	2.35	0.00	2.35	0.00	2.35	0%	0%
TOTAL	0.5	3.6	31665	0.71	6215	0.14	1237	0.03	253		

The trigger values for carbon changeout of the primary vapor carbon vessel will be dictated when BOTH of the following conditions are true:

- When total VOCs, as measured by PID, at the outlet to the primary vessel exceed 20% of the concentration measured at the inlet to the primary vessel; and,
- When total VOCs, as measured by PID, at the outlet to the primary vessel exceed 10 parts per million by volume (ppmV).

If both conditions a and b = TRUE, primary vapor carbon vessel changeout will occur.

In addition to PID readings, samples will be periodically collected for offsite analysis as described in Section 7.1 of this document.

5.7 Liquid Treatment System

Condensate generated from the vapor treatment system will be treated via gravity separation followed by carbon adsorption. The liquid treatment system's components are mounted on skids, with interconnecting piping. The system consists of the following major items:

- Bag Filters (FX-201A/B)
- Liquid Heat Exchanger (E-201)

- Oil/Water Separator (OWS-201)
- Dense Non-Aqueous Phase Liquid (DNAPL) Storage Tank (T-302)
- Light Non-Aqueous Phase Liquid (LNAPL) Storage Tank (T-303)
- Oil/Water Separator Transfer Pumps (P-203A/B)
- Bag Filters (FX-202A/B)
- Liquid Granulated Activated Carbon (LGAC-201-1/2/3)
- Treated Water Holding Tank (T-251)
- Treated Water Holding Tank Pumps (P-251A/B)

Final treated water will be transferred to a holding tank for temporary storage. Provisions will be made for periodic discharge to the sanitary sewer through a temporary discharge permit with the Buffalo Sewer Authority (Attachment C).

5.7.1 Bag Filter Skid (FX-201A/B)

The liquid from the moisture separators will be pumped through a duplex bag filter assembly (FX-201A/B) to remove any coarse particles before entering the liquid heat exchanger. Bag filters will be 25-micron and manually changed, periodically, as necessary.

5.7.2 Liquid Heat Exchanger (E-201)

The liquid treatment system will include a liquid heat exchanger to cool the process liquid prior to delivery to the NAPL separator. The heat exchanger (E-201) will receive condensate from bag filters FX-201A/B at a design temperature of approximately 185°F and cool the liquid to approximately 100°F. The heat exchanger is fitted with pressure and temperature gauges to monitor the operating conditions of the heat exchanger. The flow rate through the heat exchanger is a function of the volume associated with the combined pump cycles of all wellfield and condensate pumps. Cooling water for the liquid heat exchanger will be supplied by the cooling tower (W-451).

5.7.3 Oil/Water Separator (OWS-201), DNAPL (T-302) and LNAPL (T-303) Storage Tanks

The NAPL separator (OWS-201) will capture free phase DNAPL and LNAPL in the liquid stream. The separator is equipped with LNAPL and DNAPL accumulation areas, delineated by a coalescing plate pack, an underflow weir, and an overflow weir. The separator is equipped with a vapor-tight cover and is vented to the vapor treatment system. Effluent water accumulates in the clear-water chamber of the NAPL separator. This water is discharged via centrifugal pumps (P-203A/B) through bag filters to the discharge tank. The NAPL separator is designed for a total flow of up to 15 gpm.

The LNAPL and DNAPL recovery tanks (i.e., 55-gallon drums) will store recovered product. Separated NAPL will be stored in a DNAPL storage tank (T-302) and an LNAPL storage tank (T-303)

prior to off-site disposal by others. Both NAPL storage tanks will be equipped with high level switches and secondary containment.

5.7.4 NAPL Separator Transfer Pump (P-203A/B)

A set of transfer pumps (P-203A/B) evacuates the water from the NAPL Separator (OWS-201) to the treated water holding tank (T-251). The transfer pumps are close-coupled, centrifugal type pumps and are electrically controlled by variable frequency drives. Pump speed is controlled by a level transmitter in a stilling well/sight glass mounted on the effluent chamber of the NAPL separator. A backup pump is installed in the event of the primary pump malfunction.

5.7.5 Bag Filter Skid (FX-202 A/B)

The liquid from the NAPL Separator clear well will be pumped through a bag filter skid (FX-202A/B) to remove any residual particulate before entering the liquid phase carbon vessels. Ten-micron bag filters will be installed initially and manually changed periodically as necessary.

5.7.6 Liquid-Phase Granular Activated Carbon (LGAC-201-1/2/3)

Three 1,000 lb LGAC vessels will be used to adsorb the dissolved COCs from the liquid stream. A fourth LGAC vessel will be on standby at the Site. It is anticipated that a total of approximately 2,000 to 4,000 lbs of LGAC media will be used throughout the project. It is only anticipated that one to two changeouts will be required throughout operations. The vessels will be plumbed in series and will be equipped with sample ports to monitor adsorption efficiency during operation. Piping between the vessels will include flanged hose assemblies to facilitate switching lead/lag positions and accommodate media change-outs.

5.7.7 Treated Water Holding Tank (T-251)

A 10,000-gallon holding tank (T-251) will be provided for temporary water storage prior to being discharged to the sanitary sewer via a Buffalo Sewer Authority permit (Attachment C).

5.7.8 Treated Water Holding Tank Pumps (P-251A/B)

A set of transfer pumps (P-251A/B) will be available to pump the stored water from the treated water holding tank (T-251) to the final discharge point (if different than off-site disposal). The transfer pumps are close-coupled, centrifugal type pumps and are electrically controlled by variable frequency drives. Pump speed will be controlled by a level transmitter in discharge tank (T-251). A backup pump is installed in the event of the primary pump malfunction. These pumps may not be required pending the Buffalo Sewer Authority's selection of a final discharge point to the sanitary sewer.

5.8 Utility Usage Estimates

Utility usage estimates and requirements are shown in Table 5.6.

Table 5.6. Utility Estimates and Requirements

Utility Estimates and Requirements	Estimated Average Rate	Estimated Total
Power usage, TCH	480 kilowatt (kW)	2,272,000 kilowatt hours (kWh)
Power usage, treatment system	120 kW	567,000 kWh
Power usage, total	600 kW	2,839,000 kWh
Process water usage	-	10,000 gallons
Wellfield liquid discharge, condensate, and entrained water	0.9 gpm	252,000 gallons
Cooling Tower Blowdown	2.4 gpm	681,000 gallons
Total Liquid Discharge	3.3 gpm	933,000 gallons
Cooling Tower Makeup Water	6.0 gpm	1,710,000 gallons

A total of 2,272,000 kWh of energy will be added to the subsurface while the treatment system is expected to use 567,000 kWh for a total of 2,839,000 kWh. An expected 252,000 gallons of water extracted from the subsurface will be generated by the thermal system.

5.9 Treatment System Summary

The complete process design for the vapor/liquid collection and treatment operations are illustrated in the P&ID presented in Attachment B. Equipment specifications and sizing for major components are available in these drawings.

5.10 Electrical Distribution Systems

The electrical power distribution system consists of the following major components:

- Primary Switchboard rated at 480 Y/277 Volt (V), 3 phase, 4 wire, 65 kilo ampere interruption capacity (kAIC). Additional details of this switchboard are as follows:
 - o 5,000 A rated switchboard with a 100% neutral buss. Rated for Service Entrance use.
 - o Skid mounted and rated for outdoor use (NEMA 3R). Switchboard is designed and factory-tested in accordance with applicable ANSI, NEMA, UL and IEEE standards.

- o 5,000 A Main Breaker, with adjustable trip settings (adjustable long time, short time, instantaneous and ground fault protection settings). The main breaker will be set to a trip value of approximately 2,000 A.
 - o Main Breaker is equipped with shunt trip such that an emergency stop will remove power to all TerraTherm, Inc. equipment.
 - o Branch circuit breakers (minimum) with adjustable trip setting (adjustable long time, short time, and instantaneous protection). The branch breaker's rating plug is fully rated, and the breaker will be adjusted for the specific load.
- Secondary Switchboard 480 Y/277 V, 3 Phase, 4 Wire, 65 kAIC for power feed to process loads. Process Loads will be backed-up by a standby emergency generator and the power feed controlled by an automatic transfer switch (ATS).
 - Locally mounted and wired 112.5 kilovolt-ampere (kVA) 480-208/120 V three phase transformer and single phase 240/120 V load center. The panel will be used to supply power for controls and auxiliary components such as the office trailer, site lighting, emergency stop panels, ground fault circuit interrupter convenience receptacles, etc.

5.10.1 Instrumentation and DataCom Wiring

Installation practices for low voltage instrumentation and communications wiring in the field should provide that cabling is protected from excessive temperatures and mechanical abrasion. To the extent practicable, all instrumentation wiring should be kept separated from high voltage power cabling. Instrumentation wiring should never be bundled with or routed parallel with high voltage cabling. Where wiring must cross high voltage cabling, it should be at right angles and with as much physical separation as possible.

5.10.2 Backup Power

Backup power to operate treatment system is currently planned via an automatic transfer switch (ATS) fed by a 250 kW diesel-powered generator; however, backup power to operate the heaters is not included. A battery backup will maintain the main PLC in operation in the event of a power interruption.

5.11 Air Emissions Permitting

At the request of the NYSDEC, TerraTherm completed and submitted a NYSDEC air permit application which included discharge rates, potential to emit calculations, and destruction removal efficiencies for TerraTherm's proposed vapor treatment system (Attachment D). Upon review by the NYSDEC, TerraTherm's thermal remediation system was confirmed as a trivial activity per 6-NYCRR 201-3.3 (29) and as such, an air permit is not required for operation of the thermal treatment system. Routine operational monitoring will be conducted throughout operations as

described in Sections 7.5 and 7.6 of this document and based on the sampling schedule presented in Attachment E.

5.12 Liquid Discharge Permitting

TerraTherm has obtained a discharge permit from the Buffalo Sewer Authority for liquid discharges from the thermal treatment system (Attachment C).

6 THERMAL REMEDIATION OPERATIONS

6.1 Operational Sequence

The major phases of thermal field implementation and operations are shown below. Days in parentheses are the estimated durations of each phase. Please note that some phases may overlap based on observed temperatures and mass removal rates and trends.

- Heater ramp up (approximately 1 day of operation). The treatment system performance is verified prior to initiating heating.
- Heating to boiling (90 to 120 days of operation). Continued heating and approaching of temperature targets in the TTZ.
- Final heating phase where vaporization is maximized by adjusting the TCH system with the objective of approaching diminishing mass removal returns (69 to 99 days of operation).
- Initial cool-down phase (7 days of operation). During this phase, extraction continues at near maximum rates.

More detail and discussion of criteria for starting and completing each phase will be presented in the O&M Plan to be prepared by TerraTherm prior to ISTR operations startup.

6.2 Description of Field Activities and Operations Phases

6.2.1 Commissioning

The purpose of the commissioning phase is to inspect, test, and calibrate the thermal treatment system including all materials and equipment in the wellfield and the process equipment. This phase is intended to locate and correct any bugs or deficiencies in the system and will provide a smooth transition to full, normal operation. Clean water and air will be used to operate the system. Data collection procedures will be tested and verified. The project-specific data website will be made operational.

6.2.2 Heater Ramp up

During the heater ramp up phase, pneumatic control will be established by extraction of vapor from the HVEWs. Performance of the effluent treatment system for separation and treatment of vapors and liquids will be verified by process monitoring and sampling. Once it is documented that the treatment system meets the required criteria (flow rates and pressures), the TCH heaters will be brought online.

6.2.3 Heating

The heater operation will be controlled by the individual heater circuit Silicon Controlled Rectifiers (SCRs) and their individual temperature controllers. The SCR setpoints will be monitored

throughout operations and adjustments made as needed. Adjustments to the system operation will be made in consultation with the TerraTherm Project Engineer and Technical Director. More detail and more specific criteria will be included in the O&M Plan.

6.2.4 Diminishing Mass Removal and Treatment Completion

Demonstration of diminishing returns will be achieved utilizing multiple lines of evidence, including time at treatment temperature, asymptotic mass removal rates below approximately 10% of the peak, declining vapor concentrations as measured by a photoionization detector (PID) and analytical data (Summas) as collected by GHD, and declining dissolved phase liquid concentrations (in condensate) as measured by analytical data in samples collected by GHD. The decision to cease heating and initiate cool-down will be made by the project team, based on a holistic view of all the available data and based on the results of soil samples collected near the end of the operational period by GHD.

6.2.5 Initial Cool-Down

Once it is determined that the thermal remediation objectives have been achieved, the TCH heaters will be turned off. The extraction and treatment systems will continue to extract and treat vapors to allow for partial cool down and to capture steam and vapors still present in the subsurface. During this phase, the vapor system will operate, and the subsurface temperature monitoring will continue (refer to Section 5.2.1 for additional information regarding criteria to be met during the initial cooldown phase). This phase is expected to last approximately five days. Following the initial cool-down period, the system will be shut down and decommissioning will begin.

6.3 Decommissioning and Demobilization

Once operation is complete, TerraTherm will remove all wellheads and the heaters, liners, and TMP arrays from the subsurface. Borings will be abandoned in accordance with NYSDEC regulations. TerraTherm staff will decontaminate and remove the wellfield vapor and liquid lines, remove pipe stands and roll up cable. TerraTherm will remove the concrete and foam board insulation that were installed as the vapor cover and properly dispose of both.

TerraTherm will decontaminate and decommission the vapor and liquid treatment equipment once as much decontamination water has been processed as possible. Waste and scrap materials will be loaded into dumpsters for off-site disposal. Equipment will be cleaned and packed for return shipment to TerraTherm's yard. Rented equipment and temporary facilities will be cleaned and demobilized from the Site.

6.4 Waste Management

TerraTherm will generate general construction refuse, spent bag filters, vapor carbon, liquid carbon, NAPL, personal protective equipment, soil, concrete, foam board, and other miscellaneous

wastes. Estimated quantities have been added to Table 6.1. TerraTherm has assumed that the vapor and liquid carbon can be regenerated.

Table 6.1. Estimated Waste Types/Quantities

Waste Type	Waste Container	Quantity	UOM
Drill Cuttings (if not treated with ISTR)	Roll off	40	cy
General Construction Debris	Roll off	40	cy
Drilling Water	Frac tank/sewer	TBD	gallons
Insulation Board	Roll off	127/4	cy/tons
Concrete	Roll off	185/374	cy/tons
VGAC	Super sac	20,000	1,000 lbs
LGAC	Super sac	2,000	1,000 lbs
Liquid Discharge	Sewer	933,000	gallons
Bag Filters/Personal Protective Equipment	Drums	5	Drums

7 TREATMENT PERFORMANCE EVALUATION

7.1 Principles of Monitoring and Sampling

Operational data will be collected and reviewed to track remediation progress and compare it to predicted performance so that appropriate operational adjustments can be made in a timely manner. A PLC will monitor and record selected system operating data including relevant temperatures, pressures and flows through the aboveground treatment equipment, as well as the position of safety sensors and controls (e.g., pressure switches, level switches, and motor operated valves). Manual data checks/samples will be collected at a frequency of daily or weekly depending on the type of data. Data may also be collected on an as-needed basis for troubleshooting or system optimization. All data will flow through the project data manager and be subjected to review and quality control checks by the project team.

Manual monitoring of Site COCs in the vapor phase will be performed at least three times per week using a handheld PID. PID readings will be taken as a total measure of VOCs. Calibration of the PID will be performed per the manufacturer's calibration procedures and TerraTherm's Vapor Sampling Standard Operating Procedure (SOP) which will be included in TerraTherm's O&M Plan. Sample locations will be throughout the vapor treatment system such that removal efficiency of the vapor phase carbon beds can be monitored, and media can be changed out in a timely manner to maintain compliance with vapor emissions requirements.

In addition to the PID readings, analytical laboratory samples will be collected by GHD according to the proposed ISTR system sampling schedule included as Attachment E.

7.2 Operations Staffing Plan

An experienced TerraTherm Lead Operator, with engineering staff as needed, will be on-Site during the testing and commissioning phase. As the system transitions into full operation mode, TerraTherm's Lead Operator or a local subcontracted operator will be at the Site for data collection, maintenance, and troubleshooting (typically five days per week). TerraTherm's Operator or our subcontractor will be available to respond to the Site if the monitoring system detects any issues.

7.3 Remote Monitoring

The PLC will log selected system operating data including relevant temperatures, pressures and flows through the aboveground vapor treatment equipment, as well as the position of safety sensors and controls (pressure switches, level switches, motor operated valves, etc.). Wellfield temperature data from the field thermocouples will be collected and logged by a separate temperature data collection system. The PLC and temperature logging system will be accessible remotely through a dial up modem or high-speed internet connection, allowing TerraTherm engineering and project management staff in the office to access the PLC and observe the same

operating information available to the field staff. Alarms and shut-down conditions will result in automatic notification of TerraTherm's Operator by cell phone.

7.4 Manual Process Data Collection

The manually collected data include:

- Power usage - Reading of totalizing meters;
- Liquid flows - Reading of totalizing flowmeters inserted in the treatment system transfer lines;
- Temperature and pressure readings - Gauge readings for the treatment system;
- Wellfield pressure readings - Gauges placed in the wellfield.

7.5 Screening Level Sampling

A handheld PID (MiniRae 3000, or similar) will be used to screen the vapor concentrations at different locations (typically 3-5 times a week, weekdays):

- At the influent to the treatment system;
- At intermediate locations in between VGAC vessels, as appropriate; and,
- At the discharge location (effluent stack).

Vapor samples for screening will be collected in Tedlar™ bags. A humidity filter is typically required for the PID. The screening data will be included in the data collection sheet. TerraTherm may choose to collect additional vapor samples from individual wells or manifold sections to obtain information about the COC concentrations in vapors extracted across the Site.

A carbon changeout of the primary vapor carbon vessel will occur when both of the following conditions are true:

- a) When total VOCs, as measured by PID, at the outlet to the primary vapor carbon vessel exceed 20% of the concentration measured at the inlet to the primary vessel; and,
- b) When total VOCs, as measured by PID, at the outlet to the primary vessel exceed 10 ppmV.

If both (a) and (b) are found to be true, primary vapor carbon vessel changeout will occur.

For instance, assume that the VOC concentration at the inlet to the vapor carbon is 20 ppmV and the outlet to the primary vapor carbon is 5 ppmV. In this case, 20% of 20 ppmV is 4 ppmV; however, because the vapor carbon vessel outlet concentration is less than 10 ppmV (i.e., 5 ppmV), no carbon changeout would be required. Conversely, assume the inlet to the vapor carbon had a VOC concentration of 100 ppmV and the outlet to the primary vapor carbon had a VOC concentration of 12 ppmV. In this instance, the outlet to the vapor carbon is greater than 10 ppmV, but 20% of the 100 ppmV VOC concentration measured at the inlet is 20 ppmV; therefore, no carbon changeout would be warranted.

7.6 Grab Samples/Compliance Samples

As all the extracted COCs flow through the liquid and vapor extraction manifold pipes to the treatment system, tracking the mass removed from the remediation area is straightforward. Samples and process data from numerous locations will be used by TerraTherm to optimize the operation of the system, and to provide estimates for the following:

- Mass removed in the vapor state measured at the inlet to the vapor treatment system (collected every other week by GHD for EPA Method TO-15 analysis);
- Mass removed in dissolved state (i.e., condensate) (collected at the inlet to the LGAC vessels by GHD every other week for EPA 8260C analysis);
- Liquid discharge for compliance with Buffalo Sewer Authority's monitoring requirements (collected by GHD monthly at the LGAC effluent for Metals, Mercury, Ammonia, PCBs, BNA/SVOCs, 8260/624 VOCs, EPA 1664 A, TSS, TDS, BOD, Phosphates, Sulfide, Cyanide, Oil & Grease, and pH);
- Mass removed as NAPL as measured in the LNAPL/DNAPL storage tanks (if any produced for EPA 8260C analysis);
- Destruction removal efficiency of the vapor treatment system (determined by comparing influent samples described above, with effluent sample concentrations collected at the stack every month by GHD for EPA Method TO-15 analysis for air permit equivalency compliance outlined in Table 5.5); and,
- VEWs as needed.

TerraTherm's proposed ISTR system sampling schedule is included as Attachment E. Please note that the sampling schedule and methods may change based on regulatory review.

7.7 Energy Balance Calculations

An energy balance will be maintained throughout ISTR operations using the following data:

- TCH heater energy delivered by the TCH heaters;
- Energy removed in the form of condensable vapor;
- Energy removed in non-condensable air; and,
- Estimated heat losses.

The energy balance returns an average heating rate (in degrees per day) and an average TTZ temperature. These numbers are compared to the design numbers (energy delivery, average temperature) and the observed subsurface temperatures (from TMPs). An energy balance will be periodically calculated for the Site to verify that the thermocouples are providing accurate representation of conditions throughout the TTZ and to assess the progress of heating.

7.7.1 Energy Injected

The total energy delivered to the Site using the TCH heaters will be derived from wellfield electricity usage. Power used for the process equipment (Tier One treatment system), will be measured, or estimated separately.

7.7.2 Energy Stored

The thermocouple data will be evaluated to provide detailed information on the heat-up of the subsurface. These data will be used to determine the amount of energy stored in the subsurface (e.g., energy stored in soil is equal to the soil temperature times the specific heat capacity of soil times the mass of soil).

7.7.3 Energy Removed

Energy will be removed from the Site in the form of hot water (i.e., condensate), steam and vapors. The water will be entrained with the extracted vapors from the HVEWs. The hot vapors from the HVEWs will consist of steam and air. For air and water, the energy fluxes are determined by multiplying the flow rate times a heat capacity times the fluid temperature. For steam, it is determined as a flow rate times the specific enthalpy of the steam (heat of condensation).

7.8 Subsurface Temperatures

Data from the eight TMPs will be used to evaluate heating progress. The data will be collected and organized using a project webpage. At a minimum, the following data representations are used:

- Individual borehole temperature profiles (eight total);
- Plots of temperature versus time for all sensors; and,
- Average temperatures at different depths from top to bottom of the TTZ.

While the targeted treatment temperature is 100°C, for the purpose of monitoring performance, an average temperature of 95°C will be targeted. Targeting 95°C ensures that the S

7.9 Permit Performance Criteria

The vapor treatment system shall meet the substantive requirements of an NYSDEC air permit (as outlined in Sections 5.6.8, 7.5, and 7.6); however, a NYSDEC air permit is not required. The liquid treatment system shall meet the requirements of a temporary discharge permit from the Buffalo Sewer Authority (Attachment C).

8 REPORTING

In general, project reporting includes the following:

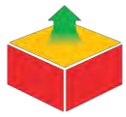
- Monthly construction and demobilization progress reports documenting major Site activities;
- Automated reporting of the subsurface temperatures in a format available for review by the project team. If desired, the data can be remotely accessible to the project team;
- Monthly operational progress reports including average TTZ temperatures, simplified energy balance, estimates for mass removal to date, and performance of the effluent treatment system;
- Weekly reporting to GHD including the following:
 - Total electrical use on a daily basis;
 - Energy input to the subsurface including voltage, current, and power on a daily basis;
 - Subsurface temperatures and pressures on a daily basis;
 - Vapor recovery, treatment system, and well head data (vacuum, flow rates) on a weekly basis (once the system operations are regularized. GHD will confirm or duplicate this data collection task on a weekly basis);
 - Total gallons of condensate collected, recycled, and/or treated and discharged on a weekly basis (once the system operations are regularized; and,
 - Fuel use on the emergency generator.
- Periodic project team conference calls may be arranged to review heating progress, discuss operational status and planning, discuss any issues, and identify any corrective measures that may need to be implemented; and;
- Final report with data package documenting the operational period.

8.1 Schedule

Attachment F presents an implementation schedule for the ISTR. The implementation schedule will be updated as need to account for any significant schedule changes.

9 REFERENCES

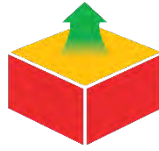
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Attachment A – Numerical Model Report

ADVISE | DESIGN | BUILD | OPERATE



TERRATHERM
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Thermal Model Simulation Report

GHD

1130 Niagara Street Site

Buffalo, New York

January 2022

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ACRONYMS AND ABBREVIATIONS

°	Degree
°C	Degrees Celsius
°F	Degrees Fahrenheit
BTU	British Thermal Unit
BTU/°F	British Thermal Units per Degree Fahrenheit
BTU/hr	British Thermal Units per Hour
cm/s	Centimeters per Second
ft	Feet
ft/day	Feet per Day
ft/ft	Feet per Foot
ft bgs	Feet Below Ground Surface
ft ²	Square Feet
gpm	Gallons per Minute
HVEW	Horizontal Vapor Extraction Well
HZ	Heated Zone
ISTR	In Situ Thermal Remediation
kW	Kilowatt
kWh	Kilowatt-Hour
TCH	Thermal Conduction Heating
TTZ	Target Treatment Zone
yd ³	Cubic Yard

1 INTRODUCTION

This Thermal Model Simulation Report presents the numerical model results for the In Situ Thermal Remediation (ISTR) system for the 1130 Niagara Street Site, Buffalo, New York (the Site), BCP #C915284. The thermal modeling results are used as a design basis for the thermal subsurface and process treatment system designs. Because of the varying treatment depths across the Site, standard box models are not sufficient for estimating heat progression. Therefore, a water and energy balance code has been developed by TerraTherm, Inc. (TerraTherm) to simulate the addition, removal, and loss of energy in each layer of the Site separately, with the layers exchanging both fluids (water and steam) and energy along their boundaries. The calculations also estimate heat losses along the top, sides, and bottom of the target treatment zone (TTZ) and the impact of groundwater flow into the TTZ, such that relatively accurate total energy demands are derived.

The water and energy balance calculations are referred to as “the model” in the following paragraphs. In the following sections the basic model setup is described, along with the results, specifically: model estimated times for heat-up and treatment, energy usage rates and total, and extraction and treatment sizing and capacity specifications. The ISTR method to be used at the Site is Thermal Conduction Heating (TCH).

2 MODEL DESCRIPTION

The model is based on simplified mass and energy balance principles relevant for thermal operation. The model can include up to 12 layers, each with different model input and derived parameters including:

- Surface area;
- Depth;
- Length of perimeter;
- Porosity;
- Initial saturation;
- Initial bulk density;
- Initial heat capacity; and,
- Initial thermal conductivity.

During the simulations, parameters such as thermal conductivity and heat capacity of the soil are changed automatically as the water saturation changes, based on published equations for these parameters. This means, for instance, that as a zone is drying out due to boiling and steam removal, the water saturation is reduced, and therefore both the heat capacity and thermal conductivity are reduced, such that only the remaining water contributes to these parameters. This gives a more realistic heating prediction than if constant values are assumed. The results of the numerical simulations have served as the basis for the design of the TCH system for the Site.

Three main geologic layers exist in the TTZ. The first layer is a fill that consists of sand, clay, and gravel with brick fragments, wood, and cinders. The fill layer extends from the ground surface to 5 – 6 feet below ground surface (ft bgs) in Parcel 1, and from ground surface to 4 ft bgs in Parcel 2. Underneath the fill layer, there is a native silty clay layer that is approximately 10 – 11 ft thick in Parcel 1, and 0 – 10 ft thick in Parcel 2. Below the native silty clay is the Onondaga Limestone. This bedrock layer is found from 10 – 17 ft bgs throughout the Site, based on the bedrock contour map and surface elevations provided.

The water table at the Site is located in the fill layer, generally from 1 – 7 ft bgs depending on location and flows to the west. The groundwater gradient is approximately 0.03 feet per foot (ft/ft). Hydraulic conductivity values were not provided so values from *Basic Ground-Water Hydrology* were used for this evaluation (Heath, 2004). The hydraulic conductivity of the surficial fill and the native silty clay is assumed to be 5.00×10^{-2} feet per day (ft/day) and the hydraulic conductivity of the Onondaga Limestone Bedrock is assumed to be 7.00×10^{-3} ft/day.

Figure 2.1 shows the simplified layers of the TTZ that served as the basis for model setup. The bottom of the TTZ varies from 15 to 27 ft bgs. A weighted average TTZ thickness was calculated to estimate the bottom of the TTZ in the model. The top of the TTZ in the model is 0 ft bgs. The

average TTZ thickness was calculated to be approximately 22.3 ft, and the average thickness of the heated zone (HZ) is 27.3 ft bgs.

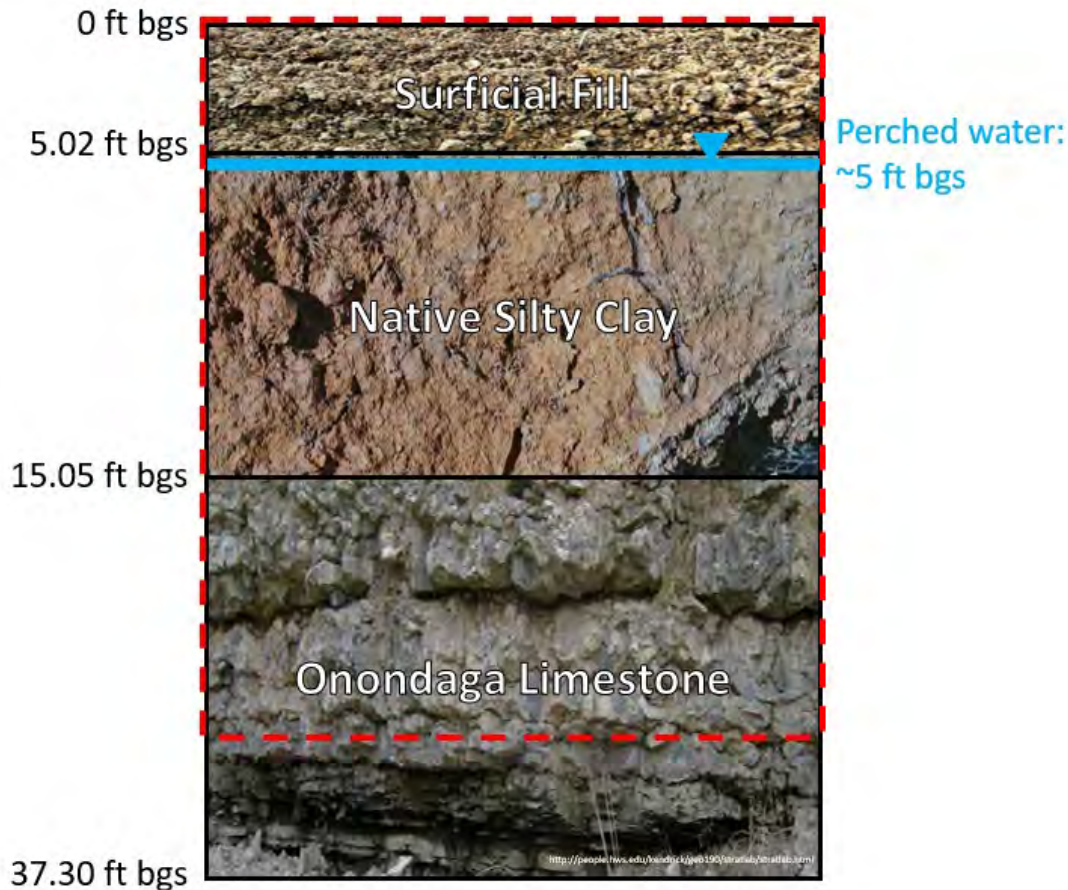


Figure 2.1. Schematic Showing the Conceptual Geology Assumed in the Treatment Area

For each layer, the water mass balance is calculated as follows:

$$M_{Net\ extraction} = M_{Out-Liquid} + M_{Out-Vapor} - M_{Injected} - M_{Inflow}$$

where M denotes cumulative water masses. Note that no fluids are injected when using the TCH technology. Exchange of fluids between the layers is estimated based on hydrogeologic parameters.

The mass removal in the liquid form is a simple summation of flow rate measurements:

$$M_{Out-Liquid} = \sum (m_{Liquid} \Delta t)$$

where the values for the flow rate m_{Liquid} are determined manually for each operational phase.

Hydraulic control will be maintained via steam generation from energy input by the heaters. The steam will be collected from the subsurface by 18 horizontal vapor extraction wells (HVEWs).

Vapors from the deeper portions of the TTZ will migrate upward along each heater through a sand pack interval to the vadose zone above the water table.

The estimated total groundwater flow through the TTZ under natural gradients is 0.03 gallons per minute (gpm). Extracted steam from the HVEWs will remove energy from TTZ.

The water mass removal in the form of vapor (steam, water vapor) is calculated as follows:

$$M_{Out-Vapor} = \sum (m_{steam} \Delta t) = \sum (m_{total\ vapor} - m_{non-cond}) \Delta t$$

where m_{steam} is the vapor flow rate made up of steam, $m_{total\ vapor}$ is the total incoming vapor flow rate, and non-condensable mass, $m_{non-cond}$ is the vapor flow rate minus the steam component (air mostly).

For these simulations, the steam extraction rates are calculated based on the energy injected by the TCH system. The equation calculating the ratio between injected energy and extracted steam is derived based on observations made on several recent full-scale TCH projects. Figure 2.2 illustrates the fluid exchanges that are accounted for in the water mass balance within the HZ.

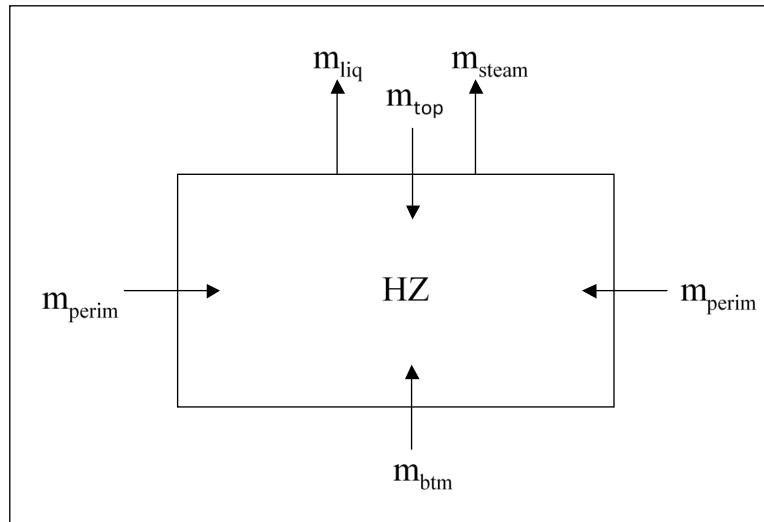


Figure 2.2. Mass Balance Principles for Water (One Layer Shown for Simplicity)

Total water extraction rates are estimated by the sum of the measured flows:

$$m_{extraction} = m_{liquid} + m_{steam}$$

The model keeps track of the volume or mass of water stored in each layer, based on extracted water and estimates of the influx of water from the sides, bottom, and top by infiltration (the perimeter and bottom arrows shown on Figure 2.2).

$$M_{present, t1} = M_{present, t0} - M_{liquid} - M_{steam\ extr.} + M_{steam\ inject} + M_{bottom} + M_{perimeter}$$

where M denotes cumulative water masses.

The quantity of water removed from the subsurface is readily measured during operations; therefore, this quantity can be compared to a relatively accurate estimate of the pre-treatment quantity of water within each layer based on values of porosity and saturation for the different zones in the model. For this Site, we assumed that infiltration into the TTZ from the top would be insignificant as we will install an insulated vapor cover over the TTZ.

Cumulative energy (E) is calculated as a summation of enthalpy fluxes (Q):

$$E = \sum (Q \Delta t)$$

An estimated energy balance is maintained for each layer in the model based on energy delivered by the TCH heaters, energy extracted in the vapor and liquid streams, and heat loss to the areas outside of the HZ.

$$E_{in} = E_{out} + E_{storage} + E_{loss}$$

The energy fluxes are related for each time step as follows:

$$Q_{in} = Q_{out} + Q_{storage} + Q_{loss}$$

where Q denotes enthalpy flux (in British Thermal Units per hour [BTU/hr]).

Figure 2.3 shows the schematic energy balance for one layer.

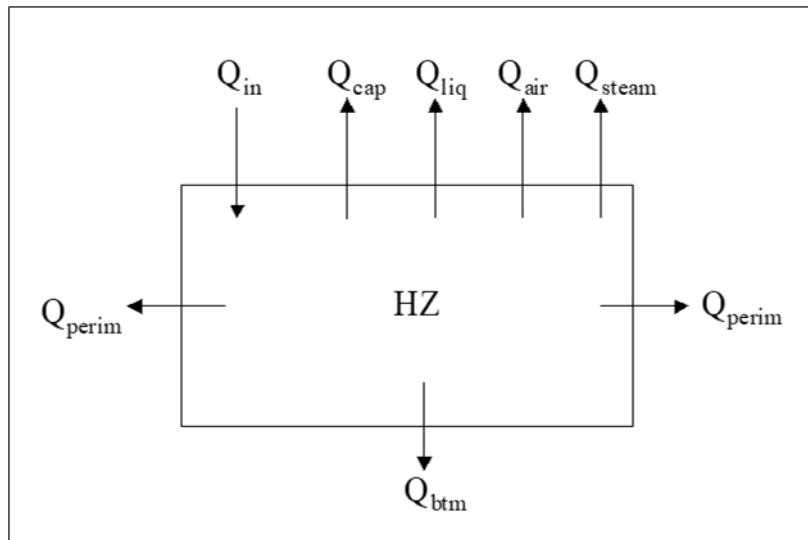


Figure 2.3. Energy Balance Schematic (One Layer Shown for Simplicity)

The estimate for Q_{in} will be based on the TCH energy input. The total energy removal from each layer is estimated as follows:

$$Q_{out} = Q_{liq} + Q_{non\ cond.\ gas} + Q_{steam\ out}$$

The energy flux in the extracted liquid is given by:

$$Q_{liq} = m_{liquid} c_{p,water} (T - T_0)$$

where c_p is heat capacity and T_0 is the ambient temperature. Please note that no active pumping is assumed to be needed during the thermal remedy.

For the extracted vapor stream, the energy flux in steam is estimated as follows:

$$Q_{steam\ out} = m_{condensate} \Delta H_{steam-ambient}$$

where m is mass flux and H is specific enthalpy (in British Thermal Units [BTU] per pound (lb)). The enthalpy of the steam was estimated from steam tables.

The energy removed as a non-condensable vapor at any given time is relatively small due to the low heat capacity of air in relation to steam and water and is therefore ignored in the calculations.

The actual heat loss cannot be calculated using accurate measures. An estimate can be made based on thermal profiles at the bottom and top of each layer, and along the perimeter, using the following calculations:

$$Q_{heat\ loss} = AK_T \frac{dT}{dz}$$

where A is the surface area through which energy is conducted, K_T is the thermal conductivity of the subsurface material, and dT/dz is the temperature gradient across the surface also expressed as $(T_1 - T_2)/(z_1 - z_2)$.

For the loss through the vapor cover the temperature difference between the top and bottom of the vapor cover layer in the model is used to calculate the temperature gradient. For the calculations, it is assumed that the ground surface remains near ambient temperatures due to a combination of wind cooling and simple heat radiation.

Heat loss calculations through the bottom and sides are accounted for in a similar manner. The layers exchange energy by thermal conduction such that energy leaves the warmer layer and enters the cooler layer.

All heat migration through the sides and through the top and the bottom layer of the model are considered lost from the model domain. Heat migration from the bottom of a layer and into the top of the underlying layer remains as energy in the model if both layers are in the HZ.

The model calculates average layer temperatures based on the energy balance and the estimated heat capacity of each layer. The stored energy is related to the heated zone heat capacity and the average temperature as follows:

$$E_{storage} = C_{p,site} (T_{avg} - T_0) + m_{steam} \Delta_{steam-ambient}$$

where $C_{p,site}$ is the overall heat capacity of the heated layer, estimated from the volume, saturation, and specific heat capacity of the soil and water:

$$C_{p,site} = V_{soil} C_{p,soil} + V_{water} C_{p,water}$$

The steam energy stored as a non-condensable vapor at any given time is relatively small and will be neglected in the calculations. For comparison with the measured temperatures, the energy balance can be used to estimate the average temperature ($T_{energybal}$) of the heated volume:

$$T_{energybal} = T_0 + \frac{E_{storage}}{C_{p,site}} = T_0 + \frac{(E_{in} - E_{out} - E_{loss})}{C_{p,site}}$$

Based on available data for the Site, a basic scenario was set up in the water and energy balance model and is presented further in the following sections.

3 DISCUSSION OF SIMULATION RESULTS

Results of the calculations indicate that the use of TCH will be an effective means of heating the Site. The TTZ is shown in Figure 3.1. The TTZ has been divided into eight smaller subareas defined by the bottom and thickness of the TTZ. Figure 3.1 also shows the TCH wellfield layout. The bottom of the TTZ ranges from 15 ft bgs to 27 ft bgs. The heater spacing is approximately 16-17 ft in interior areas and approximately 14-15 ft along the perimeter.

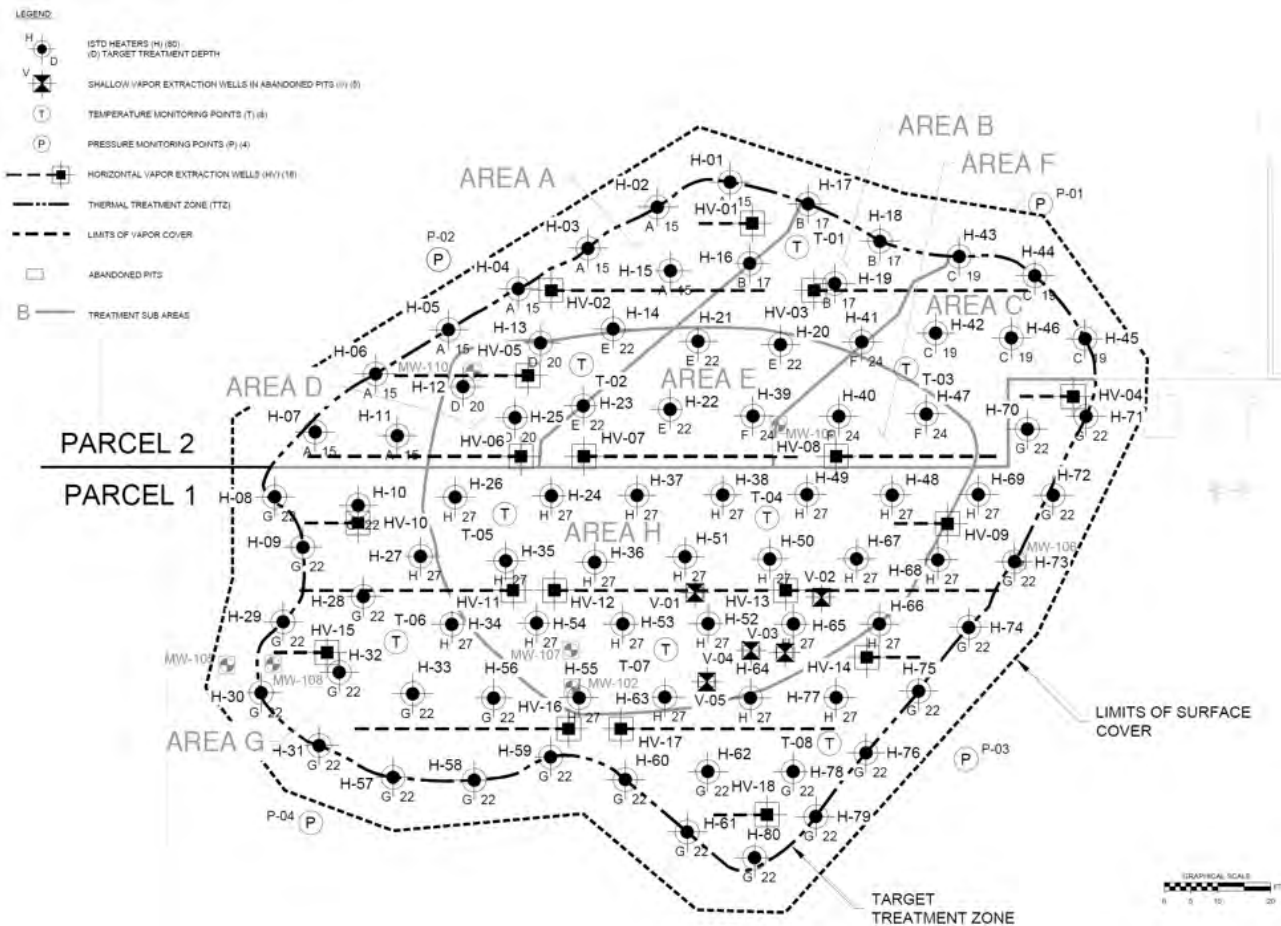


Figure 3.1. Thermal Treatment Area and Wellfield Layout

A total of 80 heaters will be used to heat the Site. The numerical model has been simplified to represent average conditions, based on overall heated thickness for the Site. The average heated thickness is calculated using a weighted average based on the overall heated length. The heated thickness is calculated from the product of the number of heaters and the TTZ thickness. The average TTZ thickness is then calculated from the total heated length divided by the total number of heaters. Table 3.1 summarizes the heated thickness calculation for the Site. Accurate estimates

of the power usage and heat-up curves require the model to reflect the average subsurface conditions of the Site as much as possible.

Table 3.1. Average TTZ Thickness Calculation

Top of TTZ (ft bgs)	Bottom of TTZ (ft bgs)	Heater Quantity	Subsurface Heater Travel Length (ft)	Total Subsurface Heated Length (ft)
0	15	9	20	180
0	17	4	22	88
0	19	5	24	120
0	20	3	25	75
0	22	5	27	135
0	24	4	29	116
0	22	26	27	702
0	27	24	32	768
Total		80		2,184
Average				27.3

Based on the actual heater calculations and heater locations, the total heated subsurface length is 2,184 ft. With 80 heaters that equals an average heated length of approximately 27.3 ft. The HZ extends five feet below the bottom of the TTZ to offset the heat losses, so the average TTZ depth is 22.3 ft. Given a treatment area of 13,249 square feet (ft²) the total modeled treatment volume is 10,942 cubic yards (yd³) and the modeled heated volume is 13,396 yd³.

3.1 Numerical Calculations

The modeled volume was divided into nine vertical layers based on the predominant geological properties present at the Site. Layers two through six in the model are all within the TTZ, while the remaining layers are below the TTZ. Layers and geology defined in the numerical model are shown in Figure 3.2.

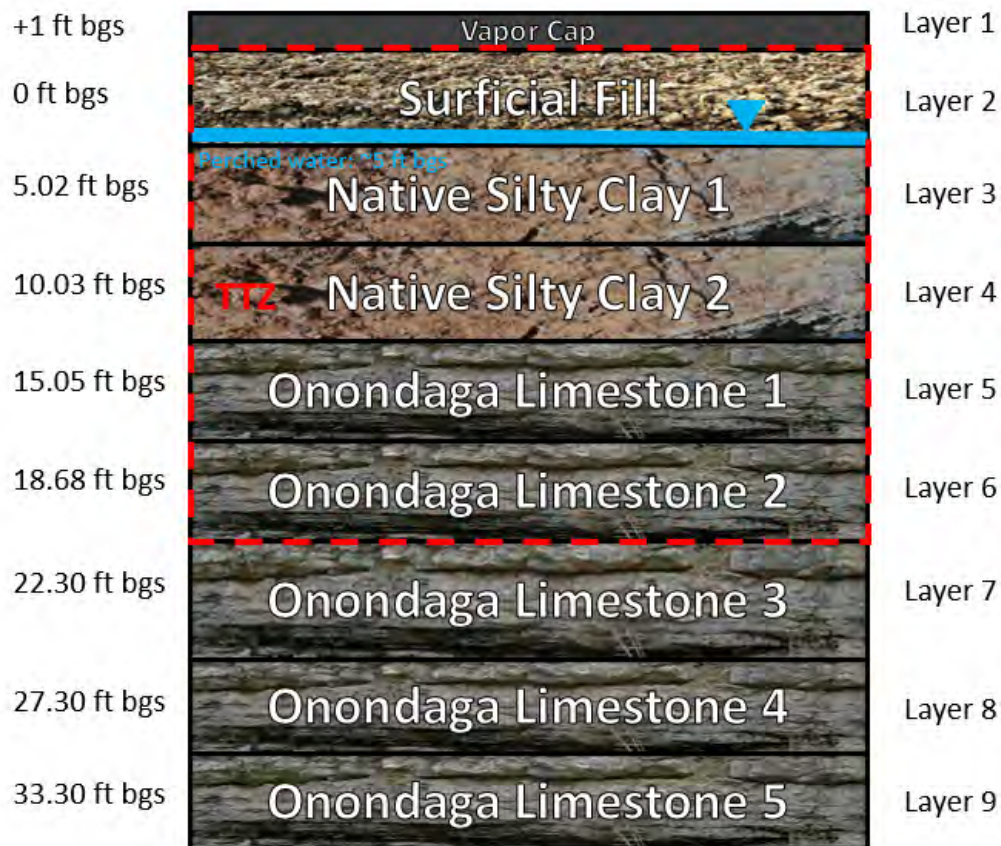


Figure 3.2. Numerical Model Layers

3.2 Input Parameters

Input values of porosity and initial saturation for the model layers appear in Table 3.2. These values serve as the starting basis for the energy balance calculations conducted in the model.

Table 3.2. Porosity and Initial Saturation for Each Layer

Layer	Geology	Top (ft bgs)	Bottom (ft bgs)	Thickness (ft)	Porosity (-)	Initial Saturation (-)	Ambient Temperature (Degrees Celsius [°C])
1	Vapor Cover	-1.00	0.00	1.00	0.01	0.00	10
2	Surficial Fill	0.00	5.02	5.02	0.46	0.90	10
3	Native Silty Clay 1	5.02	10.03	5.02	0.41	1.00	10
4	Native Silty Clay 2	10.03	15.05	5.02	0.41	1.00	10
5	Onondaga Limestone Bedrock 1	15.05	18.68	3.63	0.05	1.00	10
6	Onondaga Limestone Bedrock 2	18.68	22.30	3.63	0.05	1.00	10
7	Onondaga Limestone Bedrock 3	22.30	27.30	5.00	0.05	1.00	10
8	Onondaga Limestone Bedrock 4	27.30	32.30	5.00	0.05	1.00	10
9	Onondaga Limestone Bedrock 5	32.30	37.30	5.00	0.05	1.00	10

3.3 Energy Balance

Tables 3.3 and 3.4 provide a summary of the heat capacity in the modeled zones and a summary of the model energy balance calculations.

Table 3.3. Volume and Heat Capacity

Parameter	Value	Unit
Total volume, TTZ	10,942	yd ³
Total volume, HZ	13,396	yd ³
Solids volume, HZ	9,939	yd ³
Air volume, HZ	113	yd ³
Water volume, HZ	3,344	yd ³
Soil weight, HZ	44,397,000	lbs soil
Water weight, HZ	5,636,000	lbs water
Soil heat capacity, HZ	11,099,000	BTU/°F
Water heat capacity, HZ	5,636,000	BTU/°F
Total heat capacity, HZ	16,735,000	BTU/°F

The total volume of the TTZ is 10,942 yd³, however the HZ includes five feet of stick-down and therefore a total volume of 13,396 yd³. The total heat capacity of the heated volume is 16,735,000 British Thermal Units per degree Fahrenheit (BTU/°F). Table 3.4 shows the energy added to the TTZ by the thermal conduction heaters, the energy removed from the TTZ as steam by the vapor extraction system, and the estimated energy losses through the top, bottom, and sides of the TTZ.

Table 3.4. Energy Balance (Average Values)

Parameter	Total (kilowatts [kW])
TCH power input rate, average	477
Steam energy removal, average	126
Heat loss top, average	10
Heat loss bottom, average	72
Heat loss sides, average	120
Net energy injection	149

3.4 Temperature Progression

Figure 3.3 shows the predicted average temperature in the TTZ as a function of time. Based on the energy calculations, the predicted total duration of the remedy is estimated to be 197 days. Please note that the figure below represents the average Site temperature. During operation, the Site temperature will be observed at the centroid locations between the heaters (i.e., the coolest locations which do not reflect the average temperature of the TTZ). Thus, the observed temperature progression based on the centroid temperature sensors is expected to be behind the modeled average TTZ temperatures by up to 2-3 weeks.

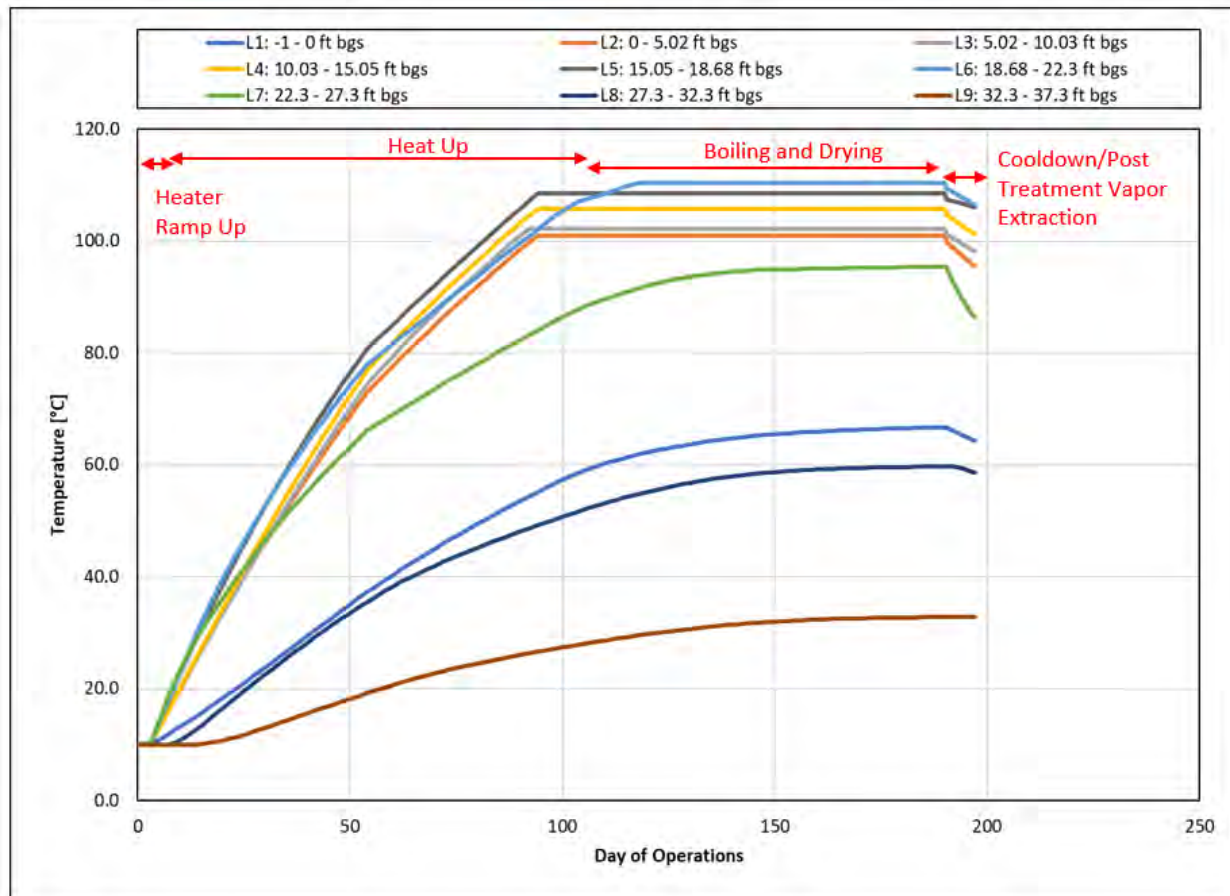


Figure 3.3. Average Temperature Curves for Layer 1 to Layer 9 during Thermal Treatment¹

The results of the simulation indicate that on average the TTZ (Layers two through six) reaches a temperature of the boiling point of water between days 90 to 120. In reality there is a delay between the modeled average temperature and the temperature observed at the centroid locations. Thus, the boiling point is expected to be reached approximately 110-140 days after startup of operation at the centroid locations, represented by the temperature monitoring points installed at the Site.

Figure 3.4 shows the development of the temperature in depth profiles over the operational period. Note that the target treatment temperature is first achieved in the 102 day profile from the model.

¹ Layers 2 through 6 are within the treatment zone, Layers 7, 8, and 9 are below the TTZ and Layer 1 is above the TTZ.

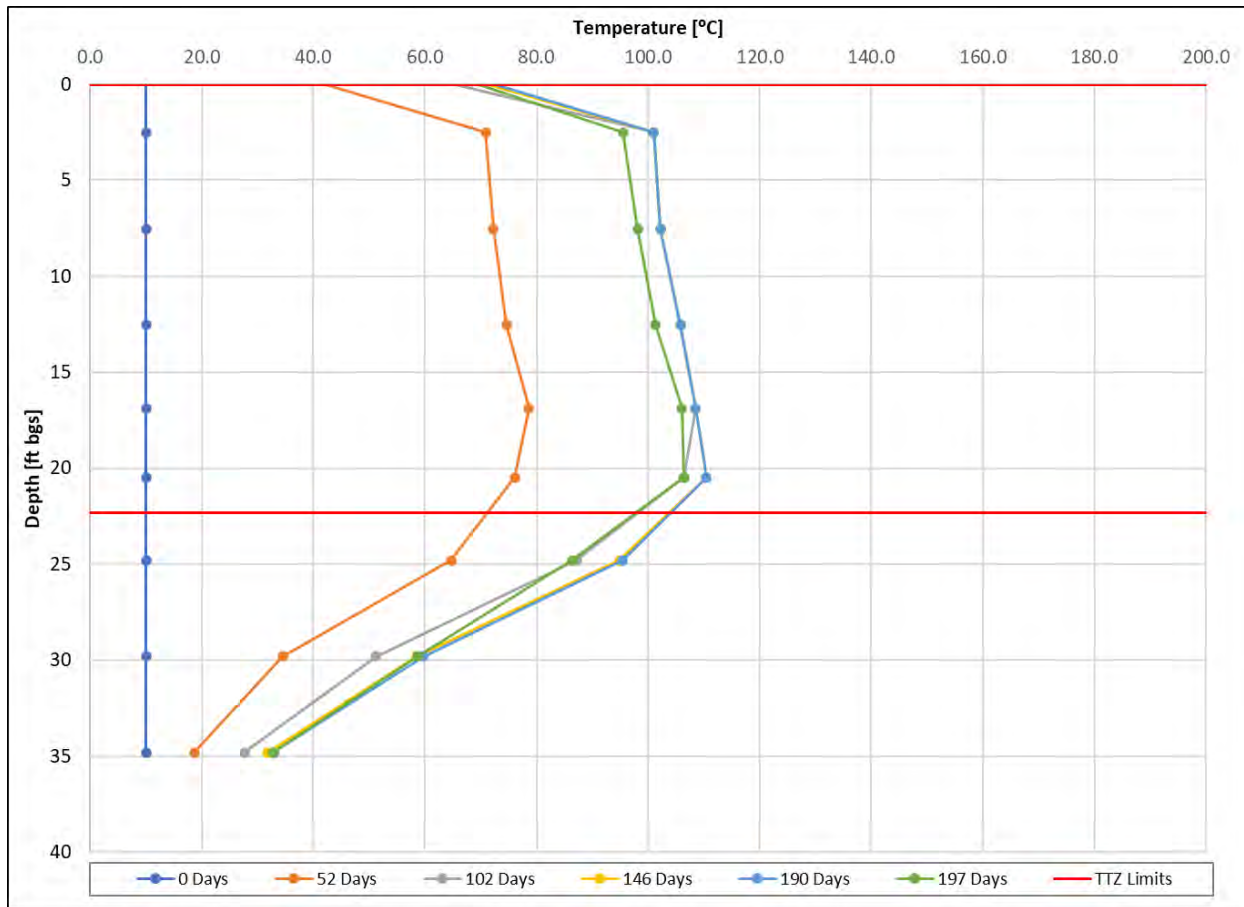


Figure 3.4. Predicted Vertical Temperature Profiles

3.5 Energy Demand

The numerical energy balance calculation accounts for the following:

- Energy input by the electrical heaters;
- Delivery efficiency of the electrical heaters;
- Heat losses to the surrounding areas (sides and through top and bottom of the TTZ);
- Removal of energy from the Site by extraction of heated air and steam; and,
- Removal of energy from the Site by extraction of heated groundwater (if required).

Table 3.5 summarizes the heating system's power usage throughout the duration of the thermal treatment system operation.

Table 3.5. Power Usage

Period	Duration (Days)	Subsurface Power Usage Kilowatt Hours (kWh)
Period 1	1	1,000
Period 2	51	687,000
Period 3	50	594,000
Period 4	44	502,000
Period 5	44	488,000
Period 6	7	0
Total	197	2,272,000

Based on the numerical calculations, it is estimated that a total of approximately 2.3 million kWh of electricity will be injected into the subsurface. The power demand of the effluent treatment system is in addition to this. The estimated total period of TCH operations is approximately 197 days including seven days of post-treatment vapor extraction and initial cool-down. The operational plan is flexible, allowing for adjustments based on observed hydraulic responses, heating progression, and contaminant extraction rates.

REFERENCES

Heath, R. C. (2004). *Basic Ground-Water Hydrology*. Denver: U.S . Geological Survey, Information Services.

Attachment B – ISTR Design Drawings

[illegible]

E100	ELECTRICAL LEGEND
E101	ELECTRICAL ONE-LINE (4 SHEETS)

P100	PROCESS LEGEND (4 SHEETS)
P101	PROCESS FLOW DIAGRAM & MASS ENERGY BALANCE (3 SHEETS)
P102	PIPING AND INSTRUMENTATION DIAGRAM (6 SHEETS)



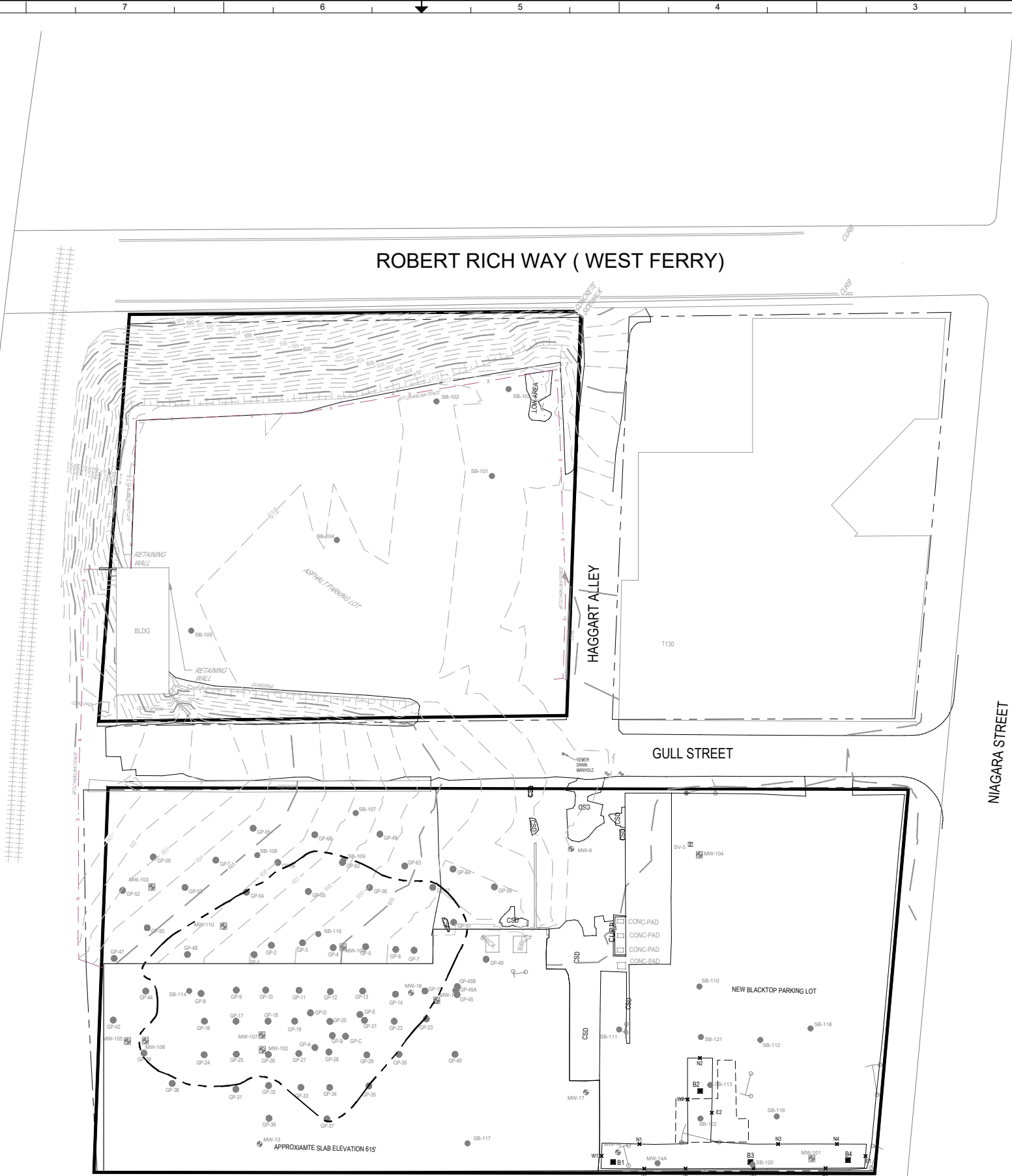
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PLOT DATE: 1/19/2022
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CTB FILE: TT-STANDARD.CTB

NOTES:

1. THE BASE MAP WAS DRAWN FROM A PLAN ENTITLED, "CURRENT SITE COVER", PREPARED BY GHD, AND WAS RECEIVED ELECTRONICALLY ON NOVEMBER 16, 2021 WITH AN ORIGINAL SCALE: 1" = 50'.

LEGEND:

--- THERMAL TREATMENT ZONE (TTZ)



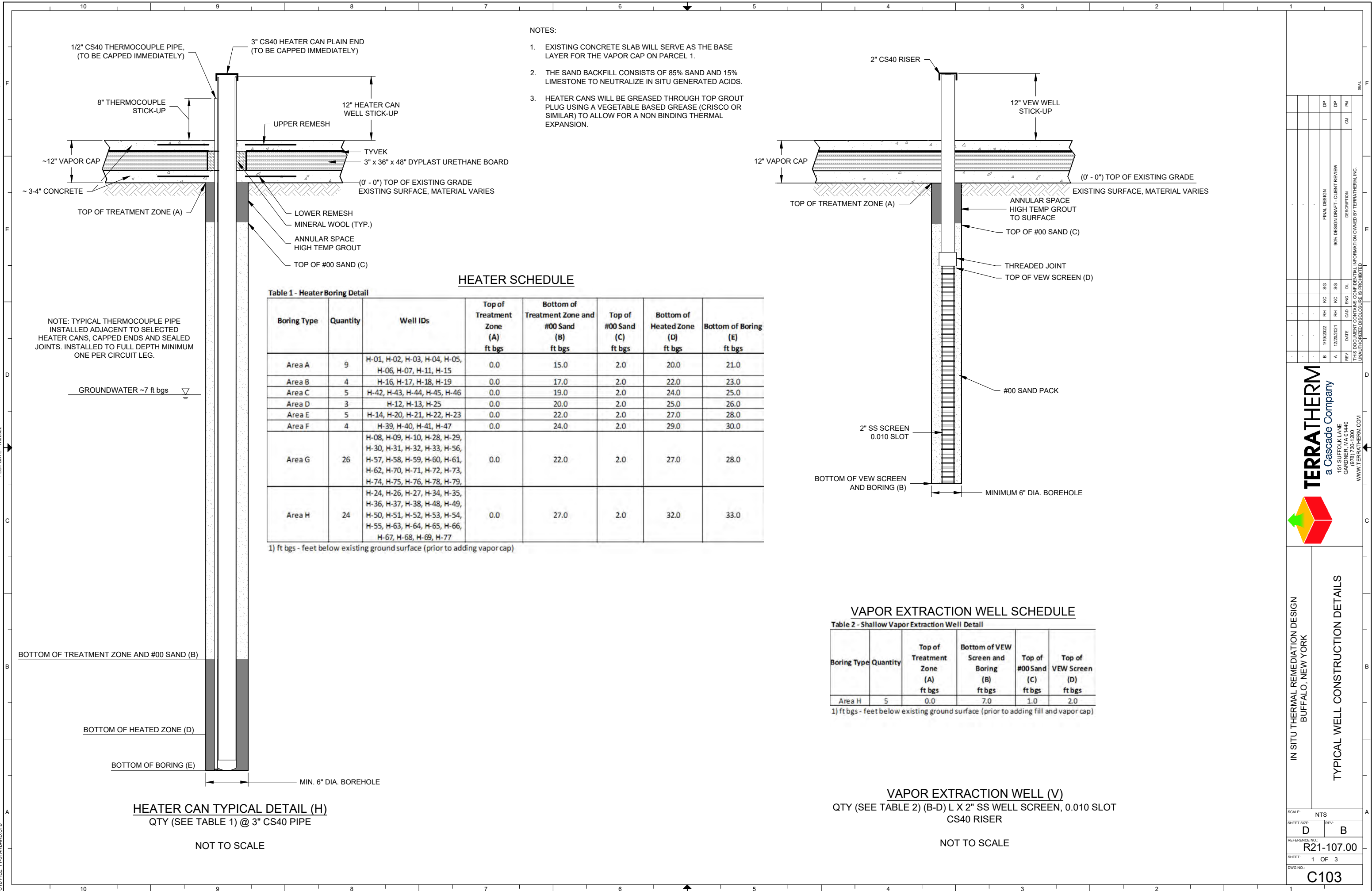
IN SITU THERMAL REMEDIATION DESIGN
BUFFALO, NEW YORK

EXISTING CONDITIONS PLAN

SCALE:	AS SHOWN
SHEET SIZE:	D B
REFERENCE NO:	R21-107.00
SHEET:	1 OF 1
DWG NO:	C101

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REV	DATE	BY	CHK	APP	DESCRIPTION
A	12/23/2021	RH	KC	SG	90% DESIGN DRAFT - CLIENT REVIEW
B	1/19/2022	RH	KC	SG	FINAL DESIGN
DP					
CM					
PM					



HEATER SCHEDULE							
Table 1 - Heater Boring Detail							
Boring Type	Quantity	Well IDs	Top of Treatment Zone (A) ft bgs	Bottom of Treatment Zone and #00 Sand (B) ft bgs	Top of #00 Sand (C) ft bgs	Bottom of Heated Zone (D) ft bgs	Bottom of Boring (E) ft bgs
Area A	9	H-01, H-02, H-03, H-04, H-05, H-06, H-07, H-11, H-15	0.0	15.0	2.0	20.0	21.0
Area B	4	H-16, H-17, H-18, H-19	0.0	17.0	2.0	22.0	23.0
Area C	5	H-42, H-43, H-44, H-45, H-46	0.0	19.0	2.0	24.0	25.0
Area D	3	H-12, H-13, H-25	0.0	20.0	2.0	25.0	26.0
Area E	5	H-14, H-20, H-21, H-22, H-23	0.0	22.0	2.0	27.0	28.0
Area F	4	H-39, H-40, H-41, H-47	0.0	24.0	2.0	29.0	30.0
Area G	26	H-08, H-09, H-10, H-28, H-29, H-30, H-31, H-32, H-33, H-56, H-57, H-58, H-59, H-60, H-61, H-62, H-70, H-71, H-72, H-73, H-74, H-75, H-76, H-78, H-79,	0.0	22.0	2.0	27.0	28.0
Area H	24	H-24, H-26, H-27, H-34, H-35, H-36, H-37, H-38, H-48, H-49, H-50, H-51, H-52, H-53, H-54, H-55, H-63, H-64, H-65, H-66, H-67, H-68, H-69, H-77	0.0	27.0	2.0	32.0	33.0

1) ft bgs - feet below existing ground surface (prior to adding vapor cap)

VAPOR EXTRACTION WELL SCHEDULE					
Table 2 - Shallow Vapor Extraction Well Detail					
Boring Type	Quantity	Top of Treatment Zone (A) ft bgs	Bottom of VEW Screen and Boring (B) ft bgs	Top of #00 Sand (C) ft bgs	Top of VEW Screen (D) ft bgs
Area H	5	0.0	7.0	1.0	2.0

1) ft bgs - feet below existing ground surface (prior to adding fill and vapor cap)

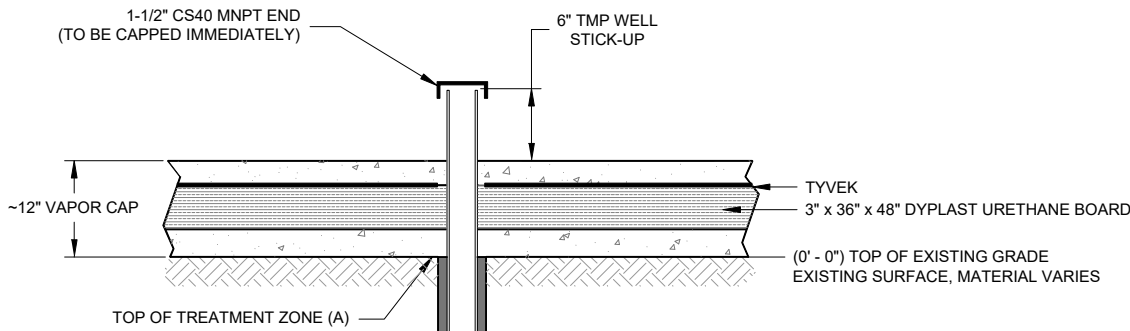
VAPOR EXTRACTION WELL (V)

QTY (SEE TABLE 2) (B-D) L X 2" SS WELL SCREEN, 0.010 SLOT
CS40 RISER

NOT TO SCALE

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FILE: \\PROJECTS\GEO - VARIOUS\BUFFALO, NY\01-DESIGN\001-DRAWINGS\001-IN-PROGRESS DWG\SC103-TYPICAL WELL DTLS.DWG
CTB FILE: TT-STANDARD.CTB

- NOTES:
- EXISTING CONCRETE SLAB WILL SERVE AS THE BASE LAYER FOR THE VAPOR CAP ON PARCEL 1.



TEMPERATURE MONITORING POINT SCHEDULE

Table 3 - Temperature Monitoring Point Detail

Boring Type	Quantity	Top of Treatment Zone (A) ft bgs	Bottom of Treatment Zone (B) ft bgs	Bottom of Boring (C) ft bgs	Temperature Sensor Locations ft bgs
Area A	0	0.0	15.0	16.0	2, 5, 8, 11, 14, 17
Area B	1	0.0	17.0	18.0	2, 5, 8, 11, 14, 17
Area C	1	0.0	19.0	20.0	2, 5, 8, 11, 14, 17
Area D	1	0.0	20.0	21.0	2, 5, 8, 11, 14, 17, 20
Area E	0	0.0	22.0	23.0	2, 5, 8, 11, 14, 17, 20, 23
Area F	0	0.0	24.0	25.0	2, 5, 8, 11, 14, 17, 20, 23, 26
Area G	2	0.0	22.0	23.0	2, 5, 8, 11, 14, 17, 20
Area H	3	0.0	27.0	28.0	2, 5, 8, 11, 14, 17, 20, 23, 26

1) ft bgs - feet below existing ground surface (prior to adding fill and vapor cap)

BOTTOM OF TREATMENT ZONE (B)

BOTTOM OF BORING (C)

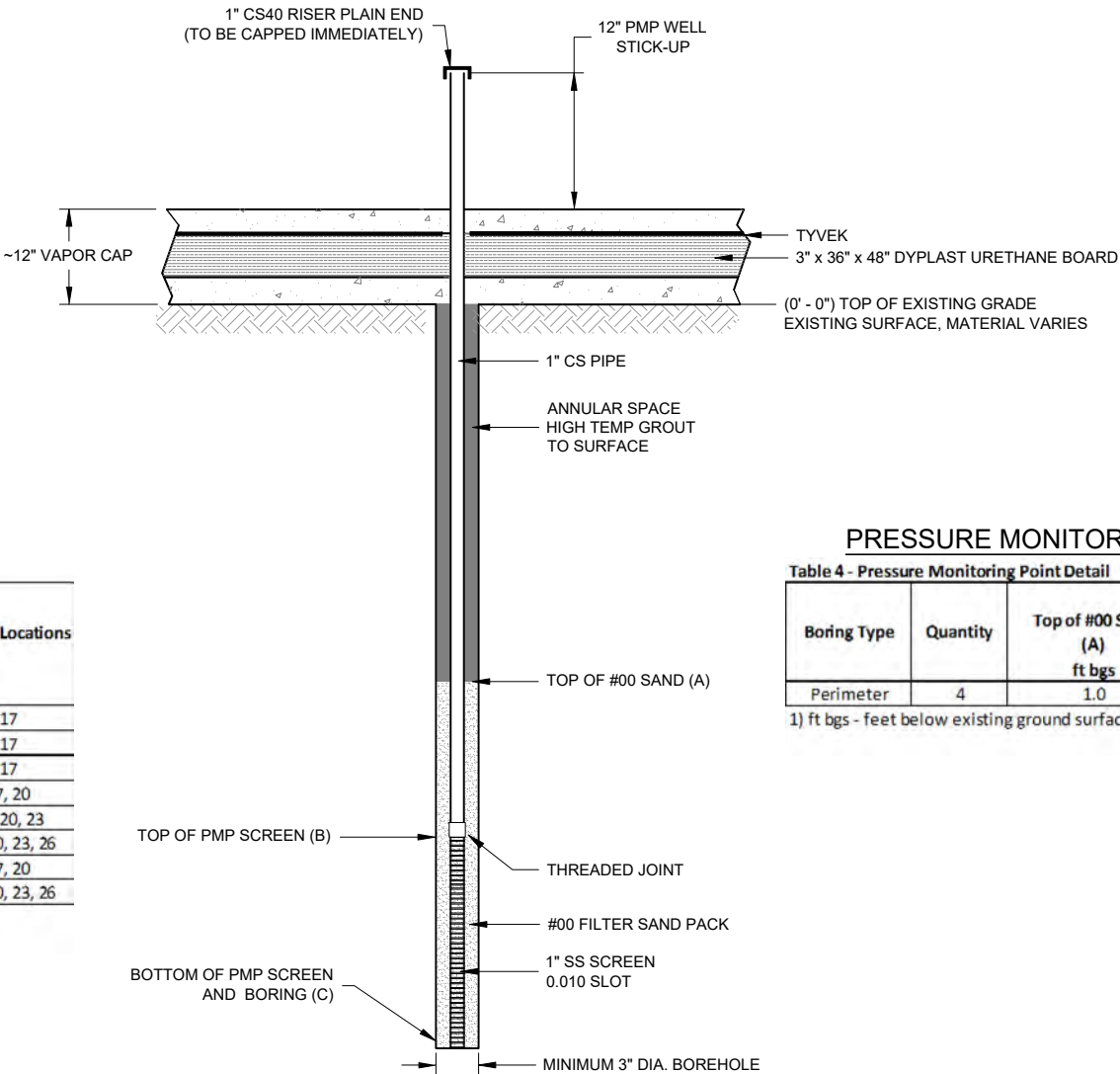
MINIMUM 3" DIA. BOREHOLE

TEMPERATURE MONITORING POINT (TMP)

QTY (SEE TABLE 3) 1-1/2" CS40 PIPE

TEMPERATURE MONITORING SENSOR DEPTHS AS SHOWN IN TABLE

NOT TO SCALE



PRESSURE MONITORING POINT SCHEDULE

Table 4 - Pressure Monitoring Point Detail

Boring Type	Quantity	Top of #00 Sand (A) ft bgs	Top of PMP Screen (B) ft bgs	Bottom of PMP Screen and Boring (C) ft bgs
Perimeter	4	1.0	3.0	5.0

1) ft bgs - feet below existing ground surface (prior to adding fill and vapor cap)

PRESSURE MONITORING POINT (P)

QTY (SEE TABLE 4) L X 1" SS WELL SCREEN, 0.010 SLOT

WITH A CS40 RISER FOR PRESSURE MONITORING

NOT TO SCALE



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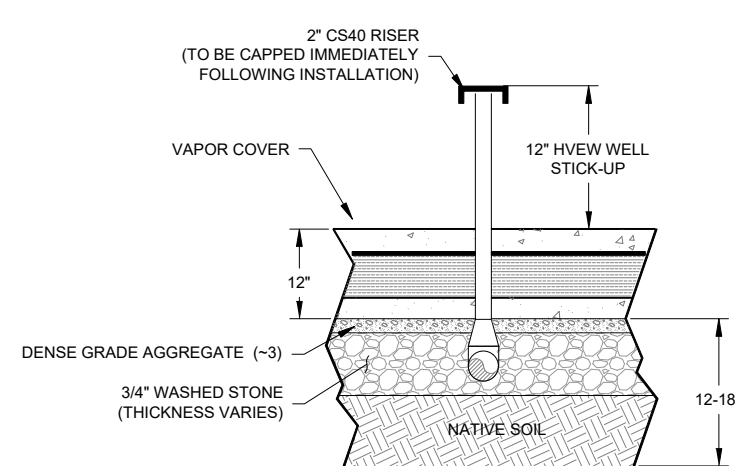
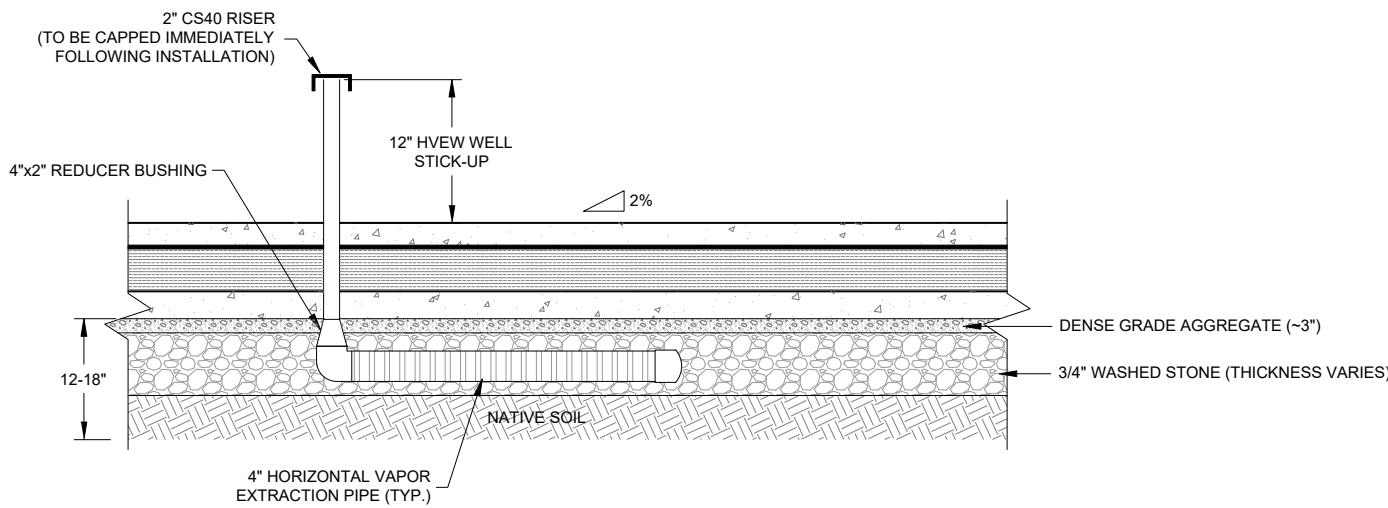
TYPICAL WELL CONSTRUCTION DETAILS

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SHEET SIZE:	D B
REFERENCE NO:	R21-107.00
SHEET:	2 OF 3
DWG NO:	C103

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FILE: \\PROJECTS\GEO - VARIOUS\BUFFALO, NY\01-DESIGN\001-DRAWINGS\001-IN-PROGRESS DWGS\C103-TYPICAL WELL DTLS.DWG

CTB FILE: TT-STANDARD.CTB



HORIZONTAL VAPOR EXTRACTION (HV) WELL DETAIL

4" SLOTTED WELL SCREEN, 0.010 SLOT
SEE SHEET C102 FOR HVEW LAYOUT
(QUANTITY 18)

NOT TO SCALE

HORIZONTAL VAPOR EXTRACTION SCHEDULE (HV)

Table 5 - Horizontal Vapor Extraction Well Detail		
Treatment Zone	Quantity	Well IDs
10 ft Screen	8	HV-01, HV-04, HV-05, HV-09, HV-10, HV-14, HV-15, HV-18
40 ft Screen	10	HV-02, HV-03, HV-06, HV-07, HV-08, HV-11, HV-12, HV-13, H-16, HV-17

- NOTES:
- EXISTING CONCRETE SLAB WILL SERVE AS THE BASE LAYER FOR THE VAPOR CAP ON PARCEL 1.



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TYPICAL WELL CONSTRUCTION DETAILS

SCALE: NTS

SHEET SIZE: D REV: B

REFERENCE NO: R21-107.00

SHEET: 3 OF 3

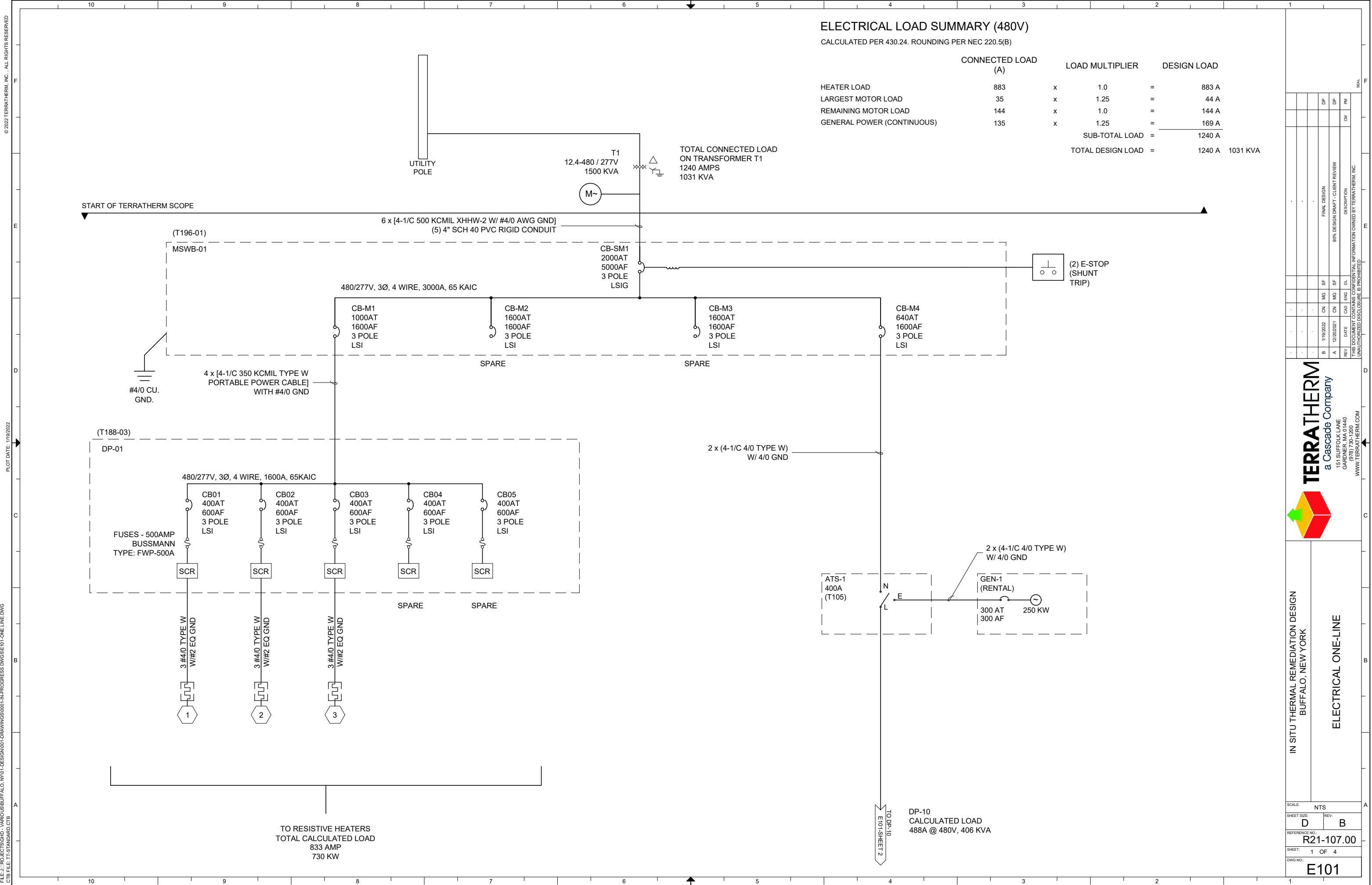
DWG NO: C103

This figure is a detailed electrical legend and schematic page from a design document. It includes symbols for various electrical components like breakers, fuses, switches, transformers, and motors, along with wiring diagrams for heater circuits and distribution panels. The page also contains general notes regarding equipment specifications, grounding requirements, and safety protocols.

The main sections are:

- ELECTRICAL ONELINE LEGEND (SMART SYMBOL)
- ELECTRICAL ONELINE LEGEND (SMART SYMBOL - INTEGRATED EQUIPMENT)
- SCR POWER WIRING SCHEMATICS
- GENERAL NOTES

The ELECTRICAL ONELINE LEGEND (SMART SYMBOL) section defines symbols for common electrical components and their ratings. The ELECTRICAL ONELINE LEGEND (SMART SYMBOL - INTEGRATED EQUIPMENT) section defines symbols for integrated equipment, including circuit breakers, fuses, and switches. The SCR POWER WIRING SCHEMATICS section shows two types of heater circuit wiring: WYE CONFIGURED, 277V and INSIDE DELTA CONFIGURED, 480V. The GENERAL NOTES section provides additional information about the project, including equipment specifications, grounding requirements, and safety protocols.





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ELECTRICAL ONE-LINE

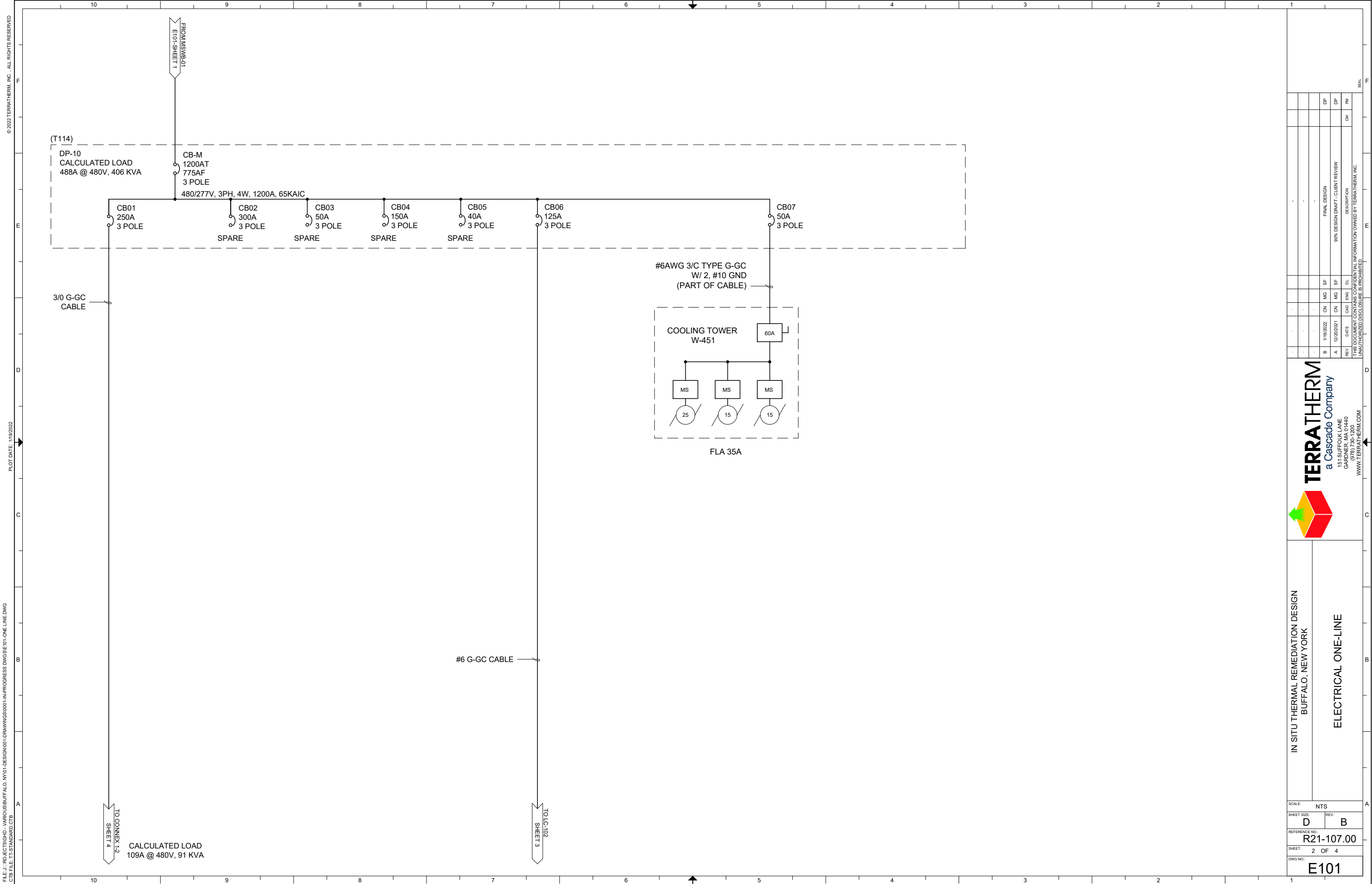
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SHEET: 1 OF 4

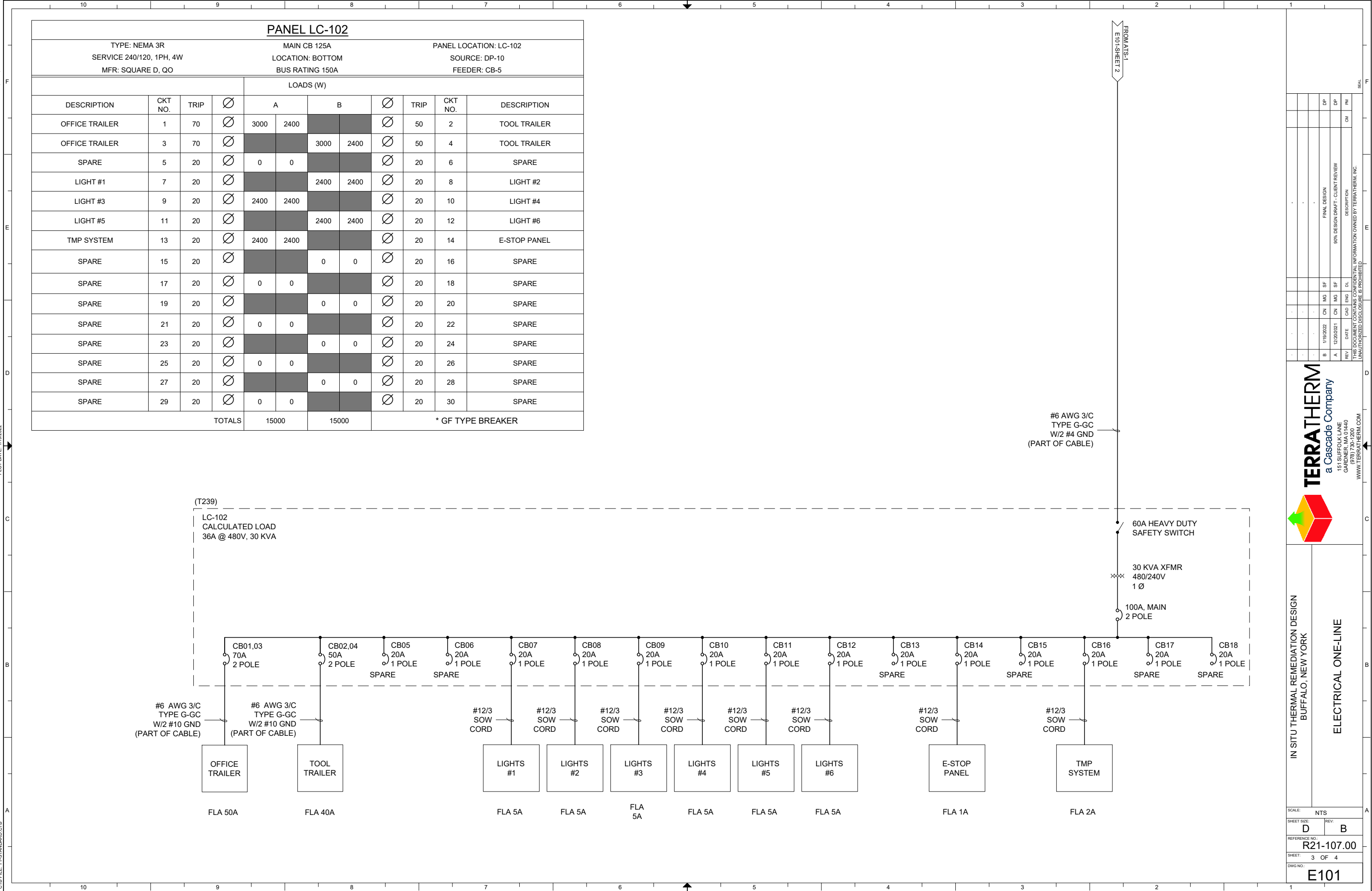
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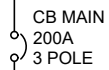
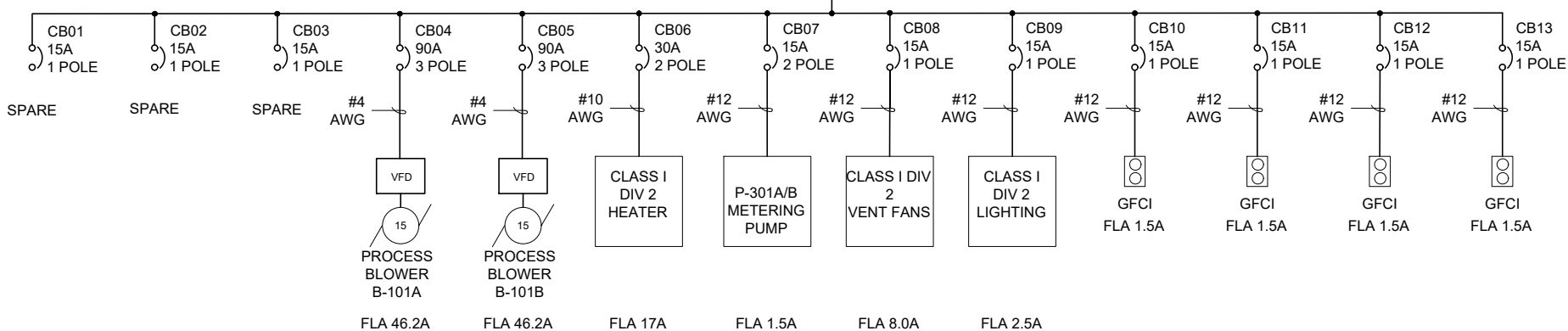
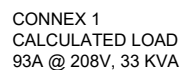
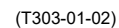
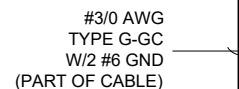
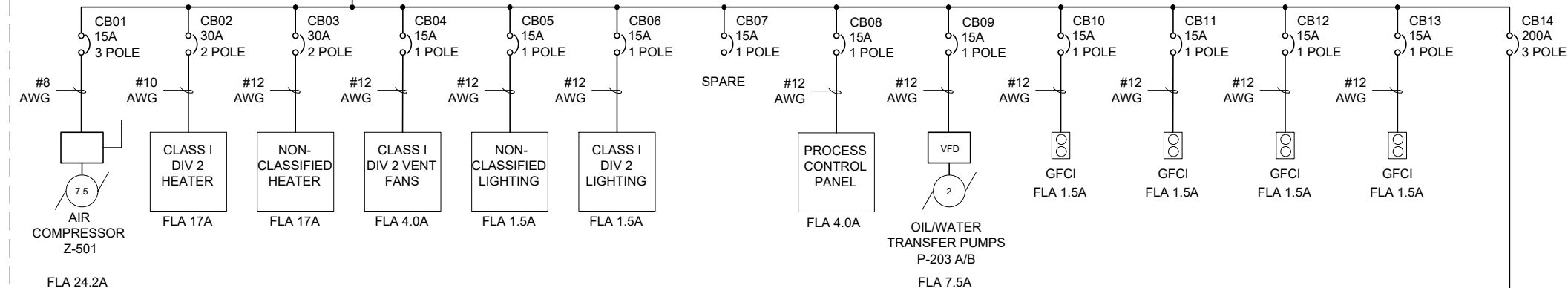
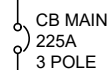
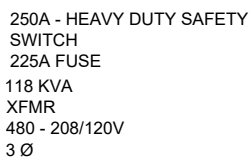
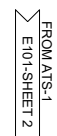
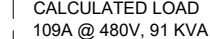


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FILE: \\PROJECTS\GEO - VARIOUS\BUFFALO, NY\01-DESIGN\001-DRAWINGS\001-IN-PROGRESS DWG\SE1E101-ONE LINE.DWG

CTB FILE: TT-STANDARD.CTB





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a Cascade Company
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GARDNER, MA 01440
(978) 730-1200
WWW.TERRATHERM.COM

IN SITU THERMAL REMEDIATION DESIGN
BUFFALO, NEW YORK

ELECTRICAL ONE-LINE

SCALE:		NTS	
SHEET SIZE:		REV:	
D		B	
REFERENCE NO.: R21-107.00			
SHEET: 4 OF 4			
DWG NO.: E101			

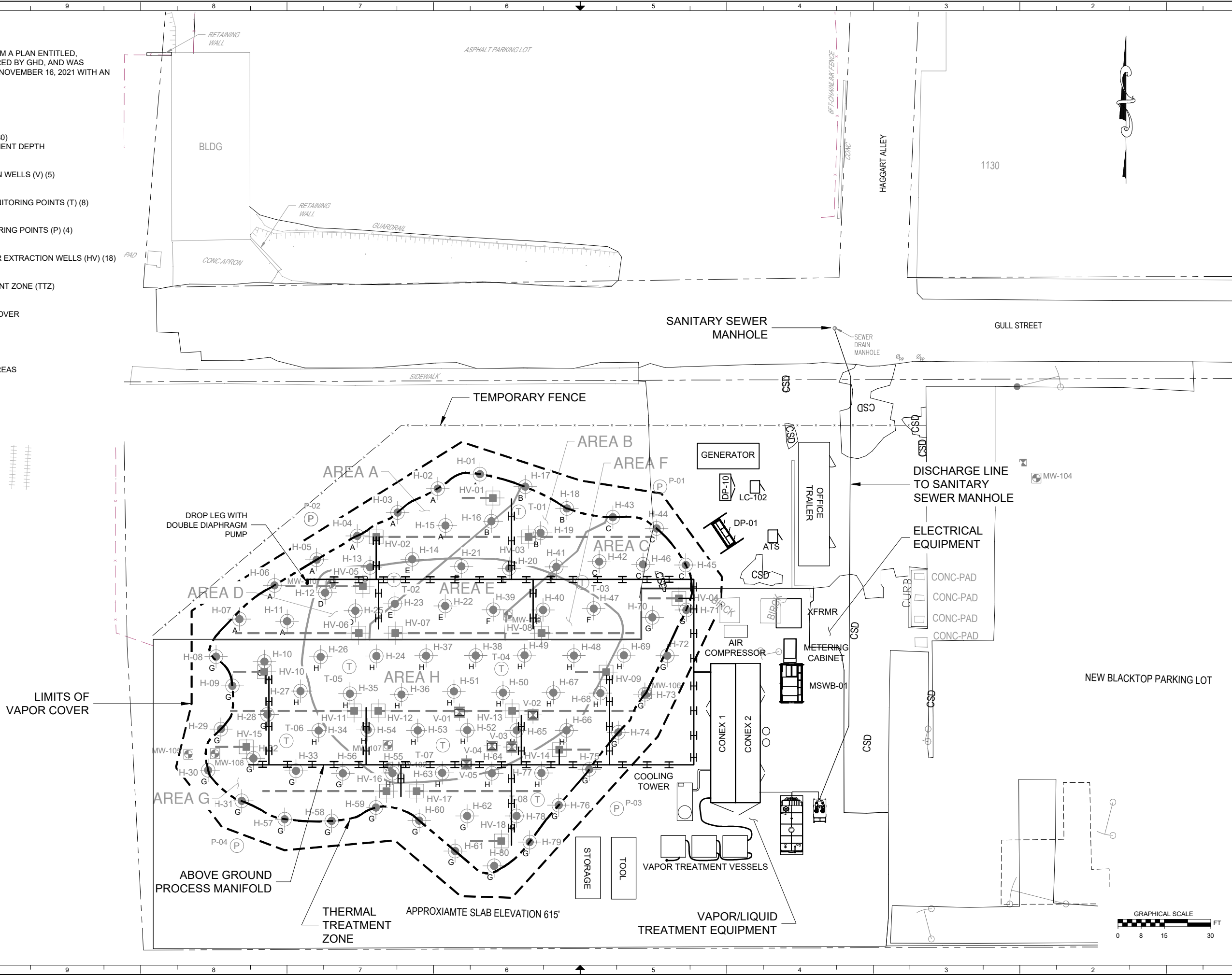
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PLOT DATE: 1/19/2022
FILE: \\PROJECTS\GEO - VARIOUS\BUFFALO, NY\01-DESIGN\001-DRAWINGS\001-IN-PROGRESS\DWGS\M101-MECHANICAL LAYOUT.DWG
CTB FILE: TT-STANDARD.CTB

NOTES:

1. THE BASE MAP WAS DRAWN FROM A PLAN ENTITLED, "CURRENT SITE COVER", PREPARED BY GHD, AND WAS RECEIVED ELECTRONICALLY ON NOVEMBER 16, 2021 WITH AN ORIGINAL SCALE: 1" = 50'.

LEGEND:

- H (80)
D (D) TARGET TREATMENT DEPTH
- V (5)
- T (8)
- P (4)
- HORIZONTAL VAPOR EXTRACTION WELLS (HV) (18)
- THERMAL TREATMENT ZONE (TTZ)
- LIMITS OF VAPOR COVER
- ABANDONED PITS
- TREATMENT SUB AREAS
- VAPOR PIPING
- PIPE STANDS (70)



DP	DP	PM
FINAL DESIGN	90% DESIGN DRAFT - CLIENT REVIEW	DESCRIPTION
1/19/2022	12/2/2021	DATE
RH	RH	ENG
KC	KC	DL
SG	SG	CM
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IN SITU THERMAL REMEDIATION DESIGN
BUFFALO, NEW YORK

MECHANICAL LAYOUT

SCALE: AS SHOWN
SHEET SIZE: D B
REFERENCE NO.: R21-107.00
SHEET: 1 OF 1
DWG NO.: M101

SYMBOL	IDENTIFICATION LETTERS					TYPICAL LETTER COMBINATIONS																			
	FIRST-LETTER		SUCCEEDING-LETTERS			CONTROLLERS				READOUT DEVICES RECORDING INDICATING		SWITCHES AND ALARM DEVICES HIGH-LOW COMB			TRANSMITTERS RECORDING INDICATING BLIND			SOLENOIDS, RELAYS, COMPUTING DEVICES	PRIMARY ELEMENT	TEST POINT	WELL OR PROBE	VIEWING DEVICE, GLASS	SAFETY DEVICE	FINAL ELEMENT	
	MEASURED VARIABLE (8)	VARIABLE MODIFIER (9)	READOUT/PASSIVE FUNCTION (10)	OUTPUT/ACTIVE FUNCTION (10)	FUNCTION MODIFIER (11)	RECORDING	INDICATING	BLIND	SELF-ACTUATED CONTROL VALVES																
A	ANALYSIS (3)		ALARM			ARC	AIC	AC		AR	AI	ASH	ASL	ASHL	ART	AIT	AT	AY	AE	AP	AW			AV	
B	BURNER, COMBUSTION					BRC	BIC	BC		BR	BI	BSH	BSL	BSHL	BRT	BIT	BT	BY	BE		BW	BG		BZ	
C	CONDUCTIVITY (1)			CONTROL	CLOSE (3)	CRC	CIC	CC		CR	CI	CAH	CAL												
D	DENSITY (1)	DIFFERENTIAL			DEVIATION (3)																				
E	VOLTAGE		ELEMENT			ERC	EIC	EC		ER	EI	ESH	ESL	ESHL	ERT	EIT	ET	EY	EE					EZ	
F	FLOW	RATIO				FRC FQRC FFRC	FIC FQIC FFIC	FC FQC FFC	FCV, FICV	FR FOR FFR	FI FQI FFI	FSH FCSH FFSH	FSL FQSL FFSL	FSHL	FRT	FIT FQIT	FT FQT	FY FQY	FE FCE FFE	FP		FG		FV FQV FFV	
G	PH (2)		GAUGE (5)			GRC	GIC	GC		GR	GI	GSH	GSL	GSHL	GRT	GIT	GT		GE						
H	HAND				HIGH		HIC	HC						HS										HV	
I	CURRENT		INDICATE (5)		MIDDLE	IRC	IIC			IR	II	ISH	ISL	ISHL	IRT	IIT	IT	IY	IE					IZ	
J	POWER		SCAN (3)			JRC	JIC			JR	JI	JSH	JSL	JSHL	JRT	JIT	JT	JY	JE					JV	
K	TIME	DERIVATIVE with time		CONTROL STATION (3)		KRC	KIC	KC	KCV	KR	KI	KSH	KSL	KSHL	KRT	KIT	KT	KY	KE					KV	
L	LEVEL		LIGHT		LOW	LRC	LIC	LC	LCV	LR	LI	LSH	LSL	LSHL	LRT	LIT	LT	LY	LE		LW	LG		LV	
M	MOISTURE (1)					MRC	MIC	MC		MR	MI	MSH	MSL	MSHL	MRT	MIT	MT		ME						
N	LEL (2)					NRC	NIC	NC		NR	NI	NSH	NSL	NSHL	NRT	NIT	NT		NE						
O			RESTRICTION		OPEN (3)																				
P	PRESSURE		POINT (TEST CONNECTION)			PRC PDRC	PIC PDIC	PC PDIC	PCV PDCV	PR PDR	PI PDI	PSH PDSH	PSL PDSL	PSHL	PRT PDRT	PIT PDIT	PT PDT	PY PDY	PE PE	PP PP				PSV PSE	PV PDV
Q	QUANTITY	INTEGRAL, TOTALIZE	INTEGRAL, TOTALIZE			QRC	QIC			QR	QI	QSH	QSL	QSHL	QRT	QIT	QT	QY	QE					QZ	
R	RADIATION (3)		RECORD		RUN (3)	RRC	RIC	RC		RR	RI	RSH	RSL	RSHL	RRT	RIT	RT	RY	RE		RW			RZ	
S	SPEED, FREQUENCY	SAFETY (7)		SWITCH	STOP (3)	SRC	SIC	SC	SCV	SR	SI	SSH	SSL	SSHL	SRT	SIT	ST	SY	SE					SV	
T	TEMPERATURE			TRANSMIT, TRANSMITTER		TRC TDRC	TIC TDIC	TC TDC	TCV TDCV	TIR TDR	TI TDI	TSH TDSH	TSL TDSL	TSHL	TRT TDRT	TIT TDIT	TT TDT	TY TDY	TE TE	TP TP	TW TW			TSE	TV TDV
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION						UR	UI							UY						UV	
V	VIBRATION (3)			VALVE, DAMPER, LOUVER						VR	VI	VSH	VSL	VSHL	VRT	VIT	VT	VY	VE					VZ	
W	WEIGHT (3)		WELL, PROBE			WRC WDRC	WIC WDIC	WC WDC	WCV WDCV	WR WDR	WI WDI	WSH WDSH	WSL WDSL	WSHL	WRT WDRT	WIT WDIT	WT WDT	WY WDY	WE WE					WZ WDZ	
X	DRAWING SPECIFIC (4)	DRAWING SPECIFIC (4), X-AXIS (3)		DRAWING SPECIFIC (4)	DRAWING SPECIFIC (4)																				
Y	EVENT, STATE	Y-AXIS (3)		AUXILIARY DEVICES			YIC	YC		YR	YI	YSH	YSL			YT	YY	YE						YZ	
Z	POSITION	SAFETY INSTRUMENTED SYSTEM (7)				ZRC ZDRC	ZIC ZDIC	ZC ZDC	ZCV ZDCV	ZR ZDR	ZI ZDI	ZSH ZDSH	ZSL ZDSL	ZSHL	ZRT ZDRT	ZIT ZDIT	ZT ZDT	ZY ZDY	ZE ZDE					ZV ZDV	

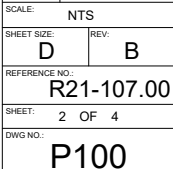
INSTRUMENT IDENTIFICATION	HAND SWITCH DESIGNATIONS
THIS INFORMATION IS BASED UPON ANSI/ISA-5.1-2009 INSTRUMENTATION SYMBOLS AND IDENTIFICATION" AND ISA-5.3-1983 "GRAPHIC SYMBOLS FOR DISTRIBUTED CONTROL/SHARED DISPLAY INSTRUMENTATION, LOGIC AND COMPUTER SYSTEM. BOTH PUBLICATIONS ARE STANDARD OF ISA, INTERNATIONAL SOCIETY OF AUTOMATION.	E -EMERGENCY STOP J -JOG 2PBL -2 PUSH BUTTONS (ON-OFF) MOMENTARY WITH BACK LIGHT(S)
EXPLANATORY NOTES FOR TABLE	
1. TERRATHERM HAS CHOSEN THE SPECIFIC RECOMMENDED FIRST-LETTER LABELS FOR [C], [D] AND [M] PER THE STANDARD. 2. TERRATHERM HAS CHOSEN THE SPECIFIC LABEL FOR THE FIRST-LETTER [G] AS pH, AND [N] AS LEL. 3. LABELS ARE GIVEN PER THE STANDARD, BUT ARE UNCOMMON FOR TERRATHERM'S APPLICATIONS. THEIR USE SHOULD BE AVOIDED AND NO SUBSTITUTION FOR THEIR MEANINGS IS ALLOWED. 4. FIRST-LETTER OR SUCCEEDING-LETTER [X] IS USED AS "DRAWING SPECIFIC" AND IS TO BE DEFINED BY A NOTE ON THE DRAWING. 5. READOUT/PASSIVE FUNCTION LETTERS [G] AND [I] ARE DIFFERENTIATED BY A GAUGE READOUT HAVING ITS ELEMENT INTEGRAL TO THE INSTRUMENT AND AN INDICATION READOUT BEING SEPARATE FROM ITS ELEMENT. 6. READOUT/PASSIVE FUNCTION LETTER [L] INDICATED A LIGHT THAT IS INTENDED TO INDICATE OPERATING STATUS AND IS NOT INTENDED FOR ALARM INDICATION. 7. VARIABLE MODIFIER LETTERS [S] AND [Z] ARE DIFFERENTIATED RESPECTIVELY AS SAFETY VALVES WITH THE VARIABLE LETTERS [F] FLOW, [P] PRESSURE OR [T] TEMPERATURE; AND AS COMPONENTS OF A SAFETY INSTRUMENTED SYSTEM. 8. ALL INSTRUMENT LABELS MUST BEGIN WITH A LETTER FROM THE "MEASURED VARIABLE" COLUMN. NO OTHER LETTERS NOR MEANINGS ARE ALLOWED. 9. "VARIABLE MODIFIER" IS USED AS REQUIRED AS IN THE CASE OF A [DPS] DIFFERENTIAL PRESSURE SWITCH OR AS A [PSV] PRESSURE SAFETY VALVE. 10. "READOUT/PASSIVE FUNCTION" AND OUTPUT/ACTIVE FUNCTION" CAN BE USED CONSECUTIVELY, AS IN THE CASE OF A [PDIS] DIFFERENTIAL PRESSURE INDICATION SWITCH OR A [LIT] LEVEL INDICATION TRANSMITTER. 11. "FUNCTION MODIFIER" ARE USED TO DIFFERENTIATE THE RELATIVE POSITION OF SWITCHES AND ALARMS. THE COMBINATION OF [HH] HIGH-HIGH IS AN ACCEPTABLE PRACTICE.	2PB -2 MOMENTARY PUSH BUTTONS (ON-OFF) JSR -JOG, STOP, RUN HOA -HAND, OFF, AUTO SS -START, STOP OC -OPEN, CLOSE OCA -OPEN, CLOSE, AUTO MR -MANUAL, REMOTE FOR -FORWARD, OFF, REVERSE

[illegible]

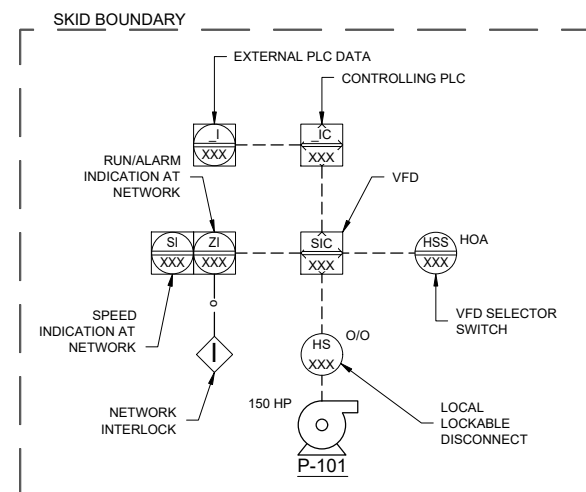
IN SITU THERMAL REMEDIATION DESIGN
BUFFALO, NEW YORK

PIPING & INSTRUMENTATION LEGEND

SCALE: NTS	
SHEET SIZE: D	REV: B
REFERENCE NO.: R21-107.00	
SHEET: 1 OF 4	
DWG NO.: P100	

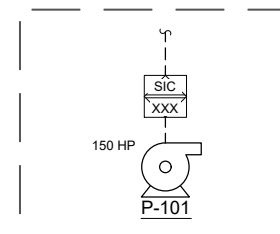


EXAMPLES



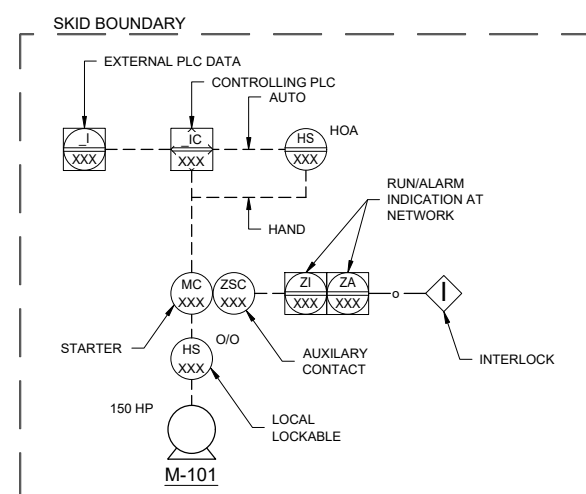
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NOT TO SCALE



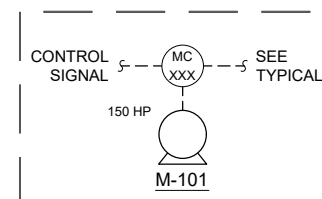
TYPICAL MOTOR SPEED CONTROL
LOOP AS REPRESENTED IN P&ID

NOT TO SCALE



TYPICAL FIXED SPEED MOTOR CONTROL LOOP DETAIL

NOT TO SCALE



TYPICAL FIXED SPEED MOTOR CONTROL
LOOP AS REPRESENTED IN P&ID

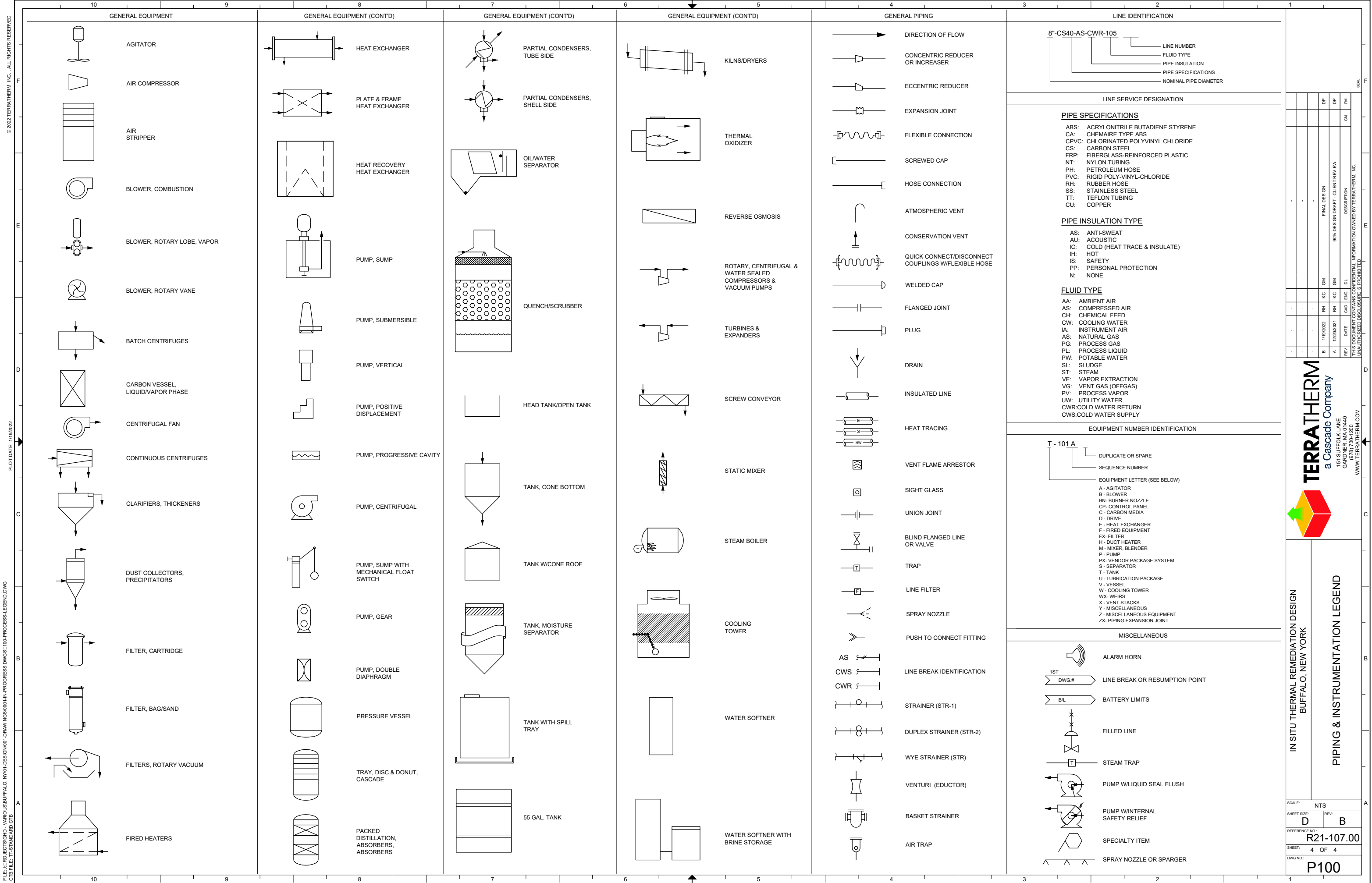
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**IN SITU THERMAL REMEDIATION DESIGN
BUFFALO, NEW YORK**

PIPING & INSTRUMENTATION LEGEND

SCALE:		NTS	
SHEET SIZE:		REV:	
D		B	
REFERENCE NO.:			
R21-107.00			
SHEET:			
3 OF 4			
DWG NO.:			
P100			





IN SITU THERMAL REMEDIATION DESIGN BUFFALO, NEW YORK					
PROCESS FLOW DIAGRAM WITH MASS AND ENERGY BALANCE					
SCALE: NTS					
SHEET SIZE: D			REV: B		
REFERENCE NO: R21-107.00					
SHEET: 2 OF 3					
DWG NO: P101					
					
TERRATHERM a Cascade Company 151 SUFFOLK LANE SUITE 200 BURLINGTON, MA 01803 (978) 730-1200 WWW.TERRATHERM.COM					
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
B	5/18/2022	RH	KC	GM	GM
A	12/20/2021	RH	KC	GM	GM
					FINAL DESIGN
					90% DESIGN DRAFT - CLIENT REVIEW
REV	DATE	CAD	ENG	DL	DESCRIPTION
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					PM

STREAM NUMBER:		21	22	23	24	25
STREAM ID:		TOTAL COOLING WATER SUPPLY	TOTAL COOLING WATER RETURN	COOLING TOWER BLOWDOWN (TO DISCHARGE)	COOLING TOWER MAKEUP WATER	TOTAL LIQUID DISCHARGE TO SEWER
Temperature (°F)		82	92	82	60	89
PressureVap (in wc ga)						
PressureVap (in wc abs)						
PressureLiq (psig)				60	35	36
Relative Humidity						
Vapor						
Non-condensables						
Molar (lbmol/hr)						
Mass (lb/hr)						
SCFM (1 atm, 68°F)						
SCFM N2						
SCFM O2						
ACFM						
Volume %						
Water						
Molar (lbmol/hr)						
Mass (lb/hr)						
SCFM (1 atm, 68°F)						
ACFM						
Volume %						
COC						
Molar (lbmol/hr)						
Mass (lb/hr)						
SCFM (1 atm, 68°F)						
ACFM						
Volume %						
Total Vapor						
Molar (lbmol/hr)						
Mass (lb/hr)						
SCFM (1 atm, 68°F)						
ACFM						
Enthalpy (BTU/hr)						
dH (BTU/hr)						
Liquid						
Water						
Molar (lbmol/hr)		4,592	4,592	67	212	110
Mass (lb/hr)		82,747	82,747	1,214	3,820	1,977
GPM		165.36	165.36	2.43	7.63	3.95
Enthalpy (BTU/hr)		6,785,237	7,612,705			
dH (BTU/hr)			827,468			
COC						
Mass (lb/hr)						
Concentration (mg/L)						
Total Liquid (lb/hr)		82,747	82,747	1,214	3,820	1,977

IN SITU THERMAL REMEDIATION DESIGN
BUFFALO, NEW YORK

PROCESS FLOW DIAGRAM WITH
MASS AND ENERGY BALANCE

SCALE: NTS

SHEET SIZE: D REV: B

REFERENCE NO: R21-107.00

SHEET: 3 OF 3

DWG NO: P101



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FINAL DESIGN

90% DESIGN DRAFT - CLIENT REVIEW

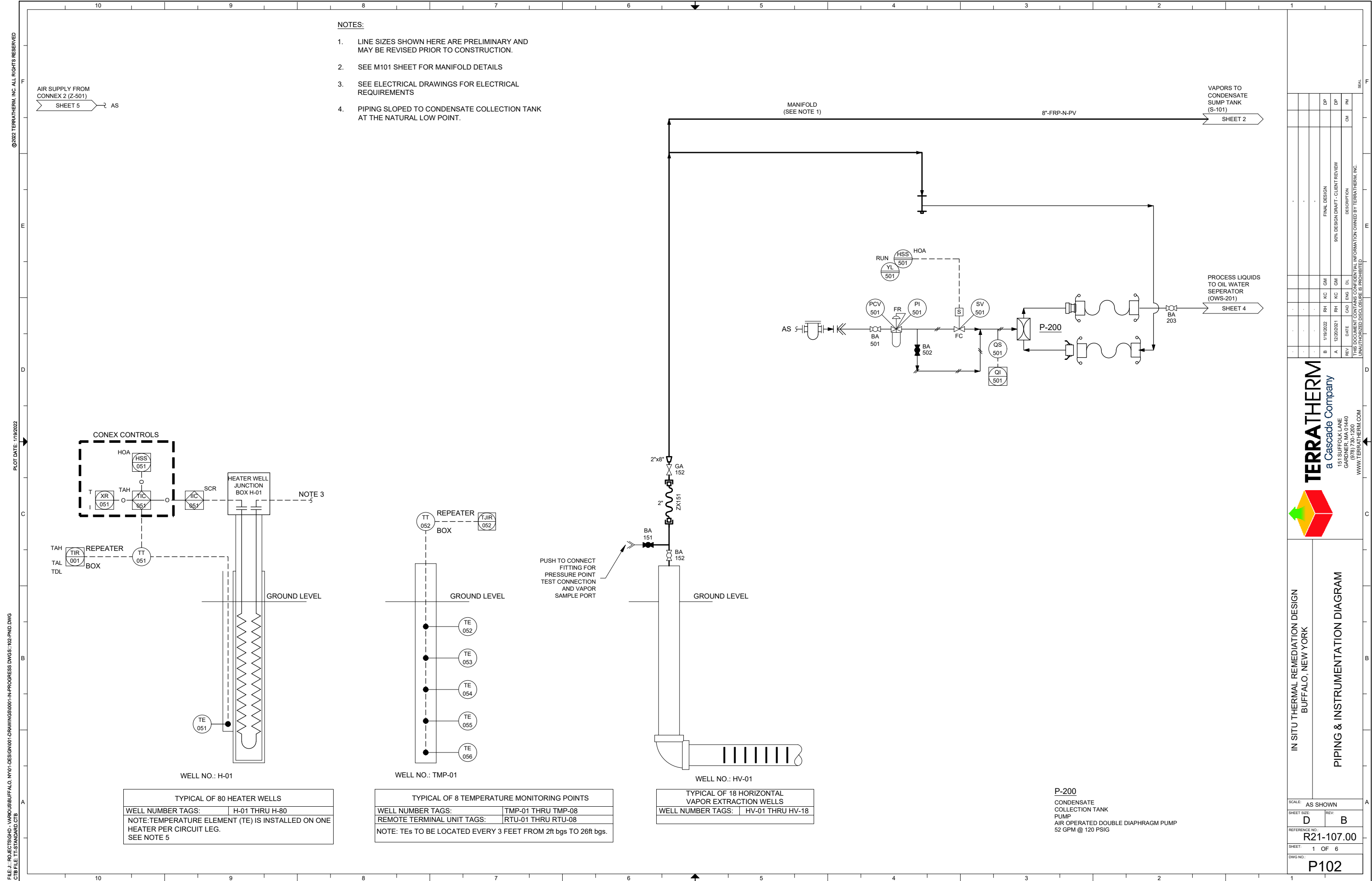
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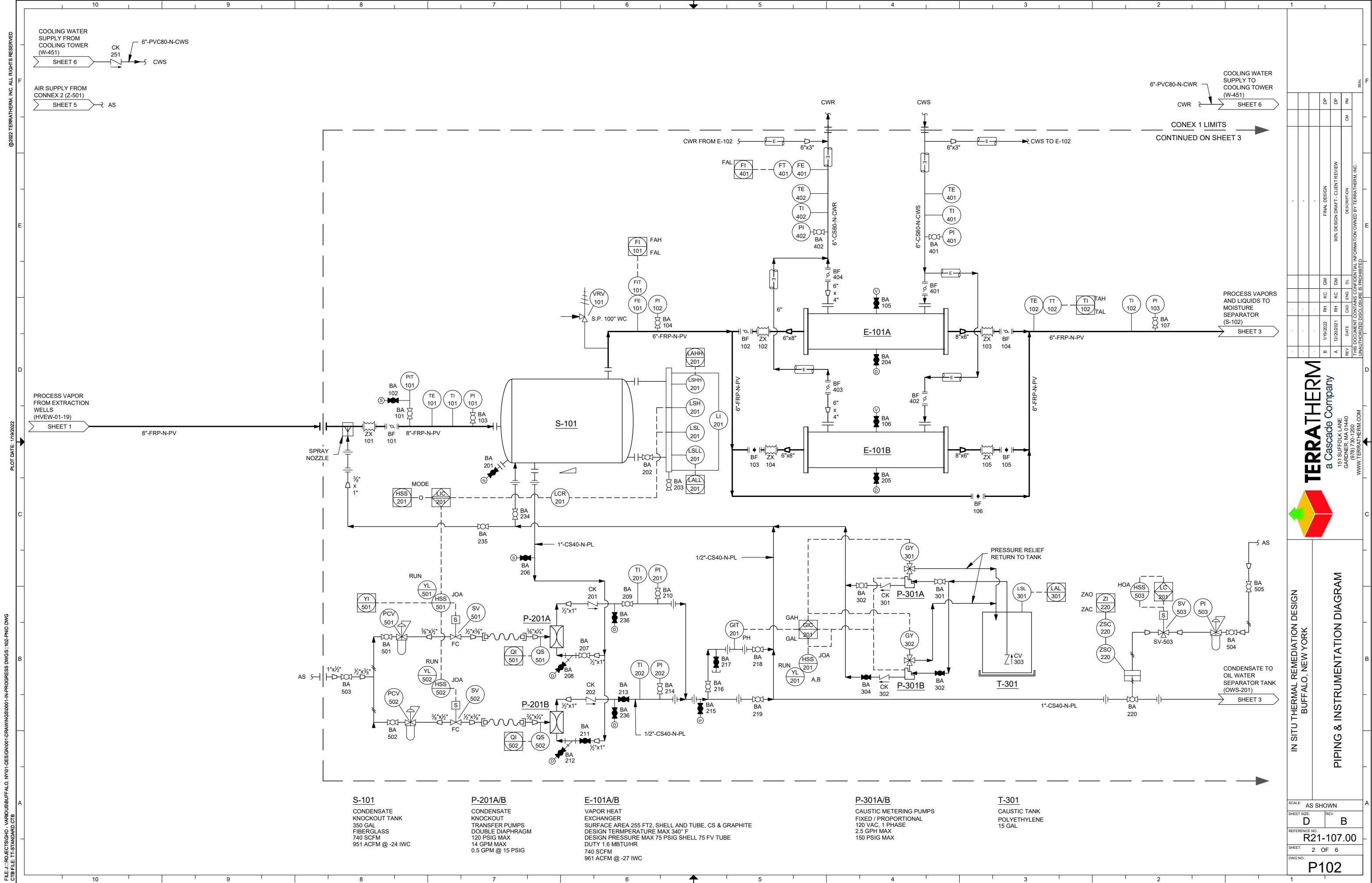
CM

PM

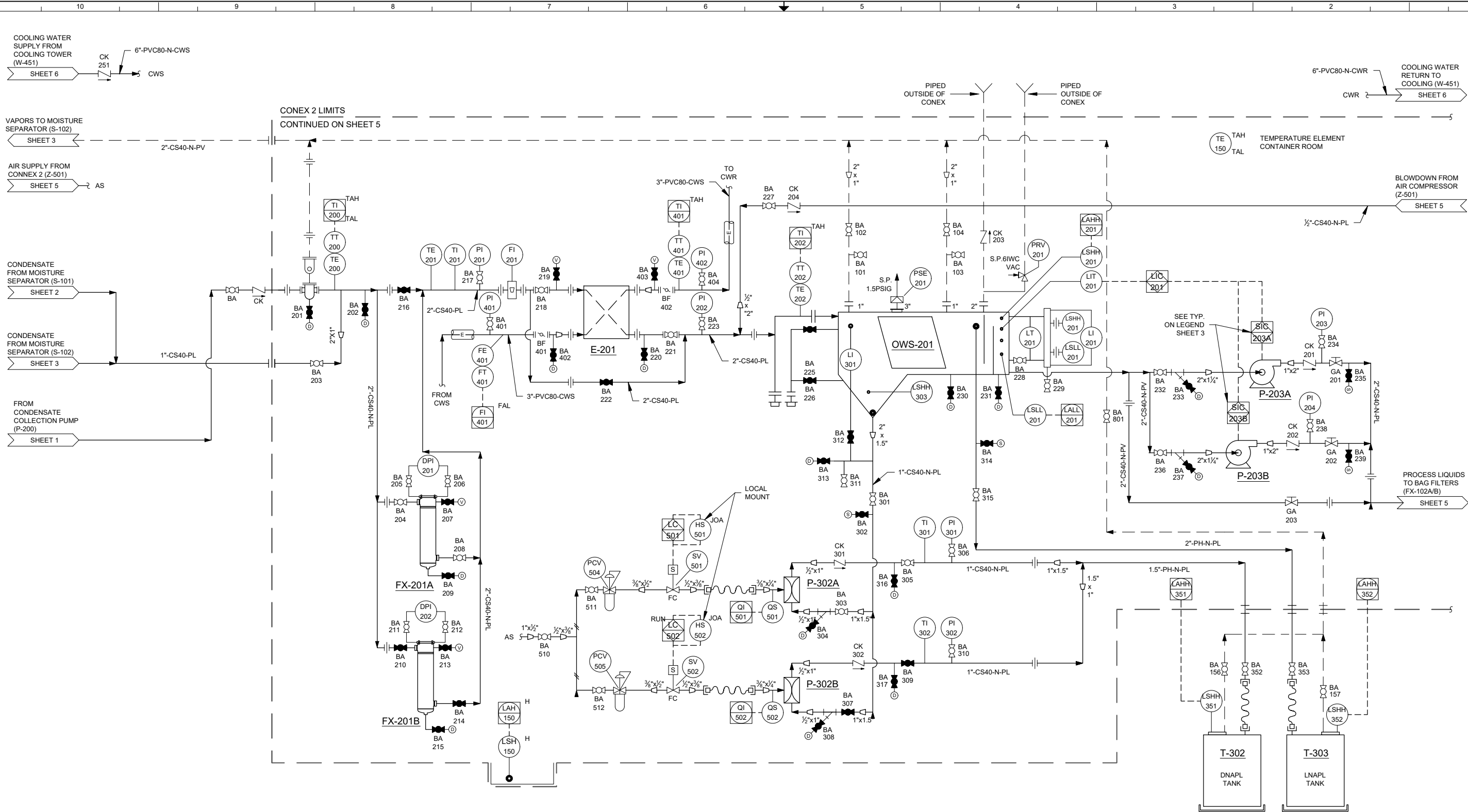
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PLOT DATE: 1/19/2022
FILE: L:\PROJECTS\GID - WABOUS\BUFFALO, NY\01-DESIGN\001-DRAWINGS\0001-IN-PROGRESS DWGS-102-PND.DWG
CTB FILE: TT-STANDARD.CTB



E-201
LIQUID HEAT EXCHANGER
SURFACE AREA 28.7 SF, PLATE AND FRAME, ALLOY C-276
DESIGN PRESSURE 150 PSIG
DESIGN TEMPERATURE 230° F
RATED CAPACITY: 15 GPM
NORMAL (OPERATIONS): 1.9 GPM

FX-201A/B
BAG FILTERS
150 PSI MAX
15 GPM MAX
STAINLESS STEEL
25 MICRON BAGS

P-302A/B
DNAPL TRANSFER PUMPS
DOUBLE DIAPHRAGM
100 PSI MAX
20 GPM MAX
0.5 GPM @ 10 PSIG

OWS-201
OIL/WATER SEPARATOR
210 GALLON
CARBON STEEL

P-203A/B
OIL/WATER SEPARATOR
TRANSFER PUMPS
2.0 HP, TEFC, VARIABLE SPEED
208 VAC, 3 PHASE
RATED CAPACITY: 20 GPM @ 45 PSIG
NORMAL (OPERATIONS): 15 GPM @ 50 PSIG

T-302
DNAPL TANK
55 GAL
23"Ø x 35" HIGH
CARBON STEEL

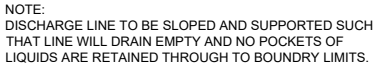
T-303
LNAPL TANK
55 GAL
23"Ø x 35" HIGH
CARBON STEEL

IN SITU THERMAL REMEDIATION DESIGN
BUFFALO, NEW YORK

PIPING & INSTRUMENTATION DIAGRAM



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AIR COMPRESSOR WITH
INTEGRAL DRYER
7.5 HP, TEFC, FIXED SPEED
208 VAC, 3 PHASE
150 PSI MAX
28 SCFM FAD
80 GALLON RECEIVER

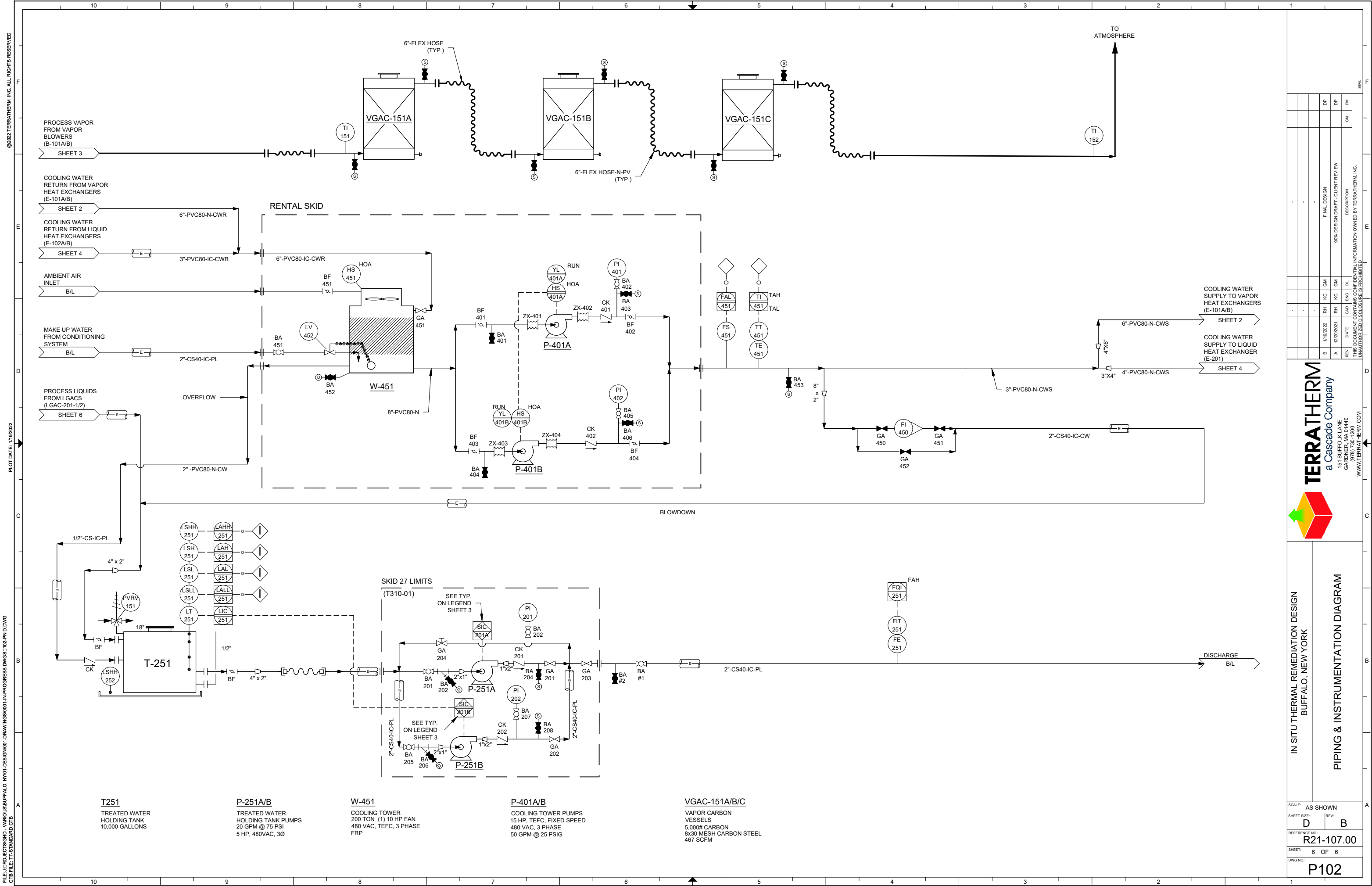
BAG FILTERS
150 PSI MAX
15 GPM MAX
STAINLESS STEEL
25 MICRON BAGS

COALESCING FILTERS
(COARSE, FINE, CARBON)
40 CFM @ 100PSI EACH

LIQUID CARBON
VESSELS
1,000# CARBON 8x30 MESH
CARBON STEEL

PIPING & INSTRUMENTATION DIAGRAM

SCALE: AS SHOWN	
SHEET SIZE: D	REV: B
REFERENCE NO.: R21-107.00	
SHEET: 5 OF 6	
DWG NO.: P102	



IN SITU THERMAL REMEDIATION DESIGN
BUFFALO, NEW YORK

PIPING & INSTRUMENTATION DIAGRAM

SCALE:	AS SHOWN
SHEET SIZE:	D B
REFERENCE NO.:	R21-107.00
SHEET:	6 OF 6
DWG NO.:	P102

Attachment C – Liquid Discharge Permit



DRAFT

EPA CATEGORY 40 CFR 403

Expiration Date: April 1, 2023*

Date Paid: December 21, 2021

BUFFALO SEWER AUTHORITY
TEMPORARY DISCHARGE PERMIT

Permittee: TerraTherm, Inc.

Location Address: 150 Suffolk Lane, Gardner, MA 01440

The above-named Permittee is hereby approved to discharge **treated groundwater and cooling tower blowdown** to the BSA Wastewater Treatment Plant only, from:

TerraTherm Job Site
1144 Niagara Street, Buffalo, New York 14213

to the Buffalo Sewer Authority facilities in accordance with the Buffalo Sewer Authority Regulations, Article VI, Section 14, and subject to the following conditions:

ARTICLE 1 CONDITIONS OF ACCEPTANCE

The discharge of the approved waste by the Permittee shall be subject to the following conditions:

a. Times, Location & Rate

The following location is designated for discharge during the hours listed and subject to the limit for rate of discharge specified:

Location: **1144 Niagara Street, Buffalo, New York 14213**
(see attached site map)

***Effective Date: April 1, 2022**

Time Discharge is Permitted: **8:00am to 5:00pm**

Limit on Rate of Discharge: **60 gallons per minute, Buffalo Sewer Authority Wastewater Treatment Plant only, dry weather only.**

b. Operations

The Permittee shall maintain cleanliness, minimize odors, ensure necessary sediment control measures are in place and maintained and protect the Buffalo Sewer Authority facilities during the permittee's operations. The Permittee shall

not permit any condition to arise which may pose a threat to public health or safety.

c. Samples and Analyses

The Buffalo Sewer Authority may from time to time, require the Permittee to sample and analyze its waste discharges. Such sampling and analyses shall be performed and results submitted by a New York State Dept. of Health certified laboratory. The analyses required shall be as specified by the Buffalo Sewer Authority, which also reserves the right, at its convenience, to sample wastes discharged by the Permittee.

d. Refusal to Discharge

The Buffalo Sewer Authority may refuse the Permittee permission to discharge wastes at any time and for any reason whatsoever, for the protection of sewer facilities against damage or flooding; to assure the proper operation and maintenance of said facilities; or to protect public health, safety or welfare.

e. Local Limits

Except as otherwise specified in this permit, the permit holder shall comply with all specific prohibitions, limits on pollutants or pollutant parameters set forth in the Buffalo Sewer Authority Sewer Use Regulations, as amended from time to time, and such prohibitions, limits and parameters shall be deemed pretreatment standards for purposes for the Clean Water Act.

ARTICLE 2 REGULATIONS

The Permittee must conform to all Buffalo Sewer Authority regulations and appropriate Federal, State and County Statutes, rules, mandates, directives, and orders concerning the collection, transportation, treatment and disposal of wastewaters.

ARTICLE 3 INSURANCE AND INDEMNIFICATION

The Permittee agrees to indemnify and hold harmless the Buffalo Sewer Authority and its agents and employees against any and all claims resulting from work performed under this permit. The permittee shall be solely responsible for any and all injury or damage to its employees or property arising from use of Buffalo Sewer Authority facilities under this permit.

In the event of any alteration, non-renewal or cancellation of these policies, at least (45) forty-five days advance notice shall be given to the Industrial Waste Section, Bird Island Treatment Plant, 90 West Ferry Street, Buffalo, New York 14213 - before such change shall be effective.

ARTICLE 4 TERMINATION FOR VIOLATION OF AGREEMENT

In the event of a violation of any of the terms and conditions of this permit by the Permittee or upon the failure to pay the charges herein specified, the Buffalo Sewer Authority shall terminate the permit by service of notice of termination by registered mail at the Permittee's office address as set forth above.

ARTICLE 5 PERMITTEE APPROVAL

Official: _____ Title: _____
Print Name Print

Signature: _____ Date: _____

ARTICLE 6 BUFFALO SEWER AUTHORITY APPROVAL

Approved as to Content:

Signature: _____ Date: _____
Industrial Waste Administrator

Issued this _____ day of _____, 2022

General Manager
Buffalo Sewer Authority

Site Map #1 here
(submitted with application)

Site Map #2 here
(submitted with application)

Attachment D – Air Permit Application and Calculations

New York State Department of Environmental Conservation

Air Permit Application



Department of
Environmental
Conservation

DEC ID									
-	-	-	-	-	-	-	-	-	-

Application ID									
-	-	-	-	-	-	-	-	-	-

Application Type	
☒ State Facility	☐ Title V

Section I

This application was requested by DER. It was NOT submitted to DEP. No air permit is needed. ME 6/30/22

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information required to complete this application, I believe the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.	
Responsible Official Gregory D. MacLeod	Title Senior Process Engineer
Signature <i>Gregory D. MacLeod</i>	Date 6/15/22

Professional Engineer Certification

I certify under penalty of law that I have personally examined, and am familiar with, the statements and information submitted in this document and all its attachments as they pertain to the practice of engineering. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.	
Professional Engineer Gregory D. MacLeod, P.E.	NYS License No. 083909
Signature <i>Gregory D. MacLeod</i>	Date 6/15/22

Section II - Identification Information

Type of Permit Action Requested			
☒ New	☐ Renewal	☐ Significant Modification	☐ Administrative Amendment
☐ Application for the construction of a new facility		☐ Application involves the construction of new emission unit(s)	
Facility Information			
Name 1130 Niagara Street Site			
Location Address 1130 Niagara Street			
☒ City / ☐ Town / ☐ Village Buffalo			Zip 14213
Owner/Firm Information			Business Taxpayer ID
Name Jenesis Development LLC			
Street Address 1150 Niagara Street			
City Buffalo	State/Province NY	Country USA	Zip 14213
Owner Classification: ☐ Federal ☐ State ☐ Municipal ☒ Corporation/Partnership ☐ Individual			
Owner/Firm Contact Information			
Name Gregory D. MacLeod		Phone (516) 524-9376	
E-mail Address gmacleod@cascade-env.com		Fax	
Affiliation TerraTherm		Title Sr. Process Engineer	
Street Address 151 Suffolk Lane			
City Gardner	State/Province MA	Country USA	Zip 01440
Facility Contact Information			
Name Kevin Crowder		Phone (978) 833-7161	
E-mail Address kcrowder@cascade-env.com		Fax	
Affiliation TerraTherm		Title Project Engineer	
Street Address 151 Suffolk Lane			
City Gardner	State/Province MA	Country USA	Zip 01440

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-					-				

Project Description	☐ Continuation Sheet(s)
In Situ Thermal Remediation (ISTR) of contaminated soils and groundwater. Vapor will be extracted from the soil and sent to an above ground treatment system that consists of a condenser and moisture separator, which is then followed by three vapor phase granular activated carbon vessels (VGAC) in series. This project is defined as a Trivial Activity per 6 CRR-NY 201-3.3 (29) and is therefore exempt from the provisions of Subparts 201-4, 201-5, and 201-6. Project duration is estimated to be 197 days.	

Section III - Facility Information

Facility Classification					
☐ Hospital	☐ Residential	☐ Educational/Institutional	☐ Commercial	☒ Industrial	☐ Utility
Affected States (Title V Applications Only)					
☐ Vermont	☐ Massachusetts	☐ Rhode Island	☐ Pennsylvania	Tribal Land: _____	
☐ New Hampshire	☐ Connecticut	☐ New Jersey	☐ Ohio	Tribal Land: _____	

SIC Code(s)			NAICS Code(s)			

Facility Description	☐ Continuation Sheet(s)
The project at 1130 Niagara Street (the Site) covers 2.62-acres, divided between two separate parcels, located in an urban, light-industrial area in the City of Buffalo. The Site is currently vacant, but previously contained a 63,000 sq. ft. L-shaped masonry warehouse/manufacturing building that was razed in 2016, and an open, grassy field that slopes from east to west.	

Compliance Statements (Title V Applications Only)
I certify that as of the date of this application the facility is in compliance with all applicable requirements. ☐ Yes ☐ No If one or more emission units at the facility are not in compliance with all applicable requirements at the time of signing this application (the 'NO' box must be checked), the noncomplying units must be identified in the "Compliance Plan" block on page 8 of this form along with the compliance plan information required. For all emission units at the facility that are operating <u>in compliance</u> with all applicable requirements, complete the following: This facility will continue to be operated and maintained in such a manner as to assure compliance for the duration of the permit, except those emission units referenced in the compliance plan portion of this application. For all emission units subject to any applicable requirements that will become effective during the term of the permit, this facility will meet such requirements on a timely basis. Compliance certification reports will be submitted at least once per year. Each report will certify compliance status with respect to each applicable requirement, and the method used to determine the status.

Facility Applicable Federal Requirements									☐ Continuation Sheet(s)
Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause

Facility State Only Requirements									☐ Continuation Sheet(s)
Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
6	CRR	201	3	3				29	

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Facility Compliance Certification										☐ Continuation Sheet(s)
Rule Citation										
Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause	
Applicable Federal Requirement			Capping	CAS Number		Contaminant Name				
State Only Requirement										
Monitoring Information										
* Work Practice Involving Specific Operations			Ambient Air Monitoring			* Record Keeping/Maintenance Procedures				
Compliance Activity Description										
Process vapors will be sampled on weekdays during operations using a handheld photo ionization detector (PID). Vapors will be sampled at several points in the treatment system. These points include the influent to the VGAC treatment train, effluent from the primary and secondary VGAC vessels, and effluent from the VGAC treatment train. A log of PID readings will be kept both electronically and on site.										
Work Practice Type Code	Process Material					Reference Test Method				
	Code	Description								
Monitored Parameter					Manufacturer's Name/Model Number					
Code	Description									
Limit			Limit Units							
Upper	Lower	Code	Description							
Averaging Method			Monitoring Frequency			Reporting Requirements				
Code	Description		Code	Description		Code	Description			
Facility Emissions Summary										☐ Continuation Sheet(s)
CAS Number	Contaminant Name					Potential to Emit (tons/yr)	Actual Emissions (pounds/yr)			
0NY075 - 00 - 5	PM-10					0				
0NY750 - 02 - 5	PM-2.5					0				
007446 - 09 - 5	Sulfur Dioxide					0				
0NY210 - 00 - 0	Oxides of Nitrogen					0				
000630 - 08 - 0	Carbon Monoxide					0				
007439 - 92 - 1	Lead (elemental)					0				
0NY998 - 00 - 0	Total Volatile Organic Compounds					15.8	252.6			
0NY100 - 00 - 0	Total Hazardous Air Pollutants					15.8	251.3			
0NY750 - 00 - 0	Carbon Dioxide Equivalents									

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Section IV - Emission Unit Information

Emission Unit Description										☐ Continuation Sheet(s)
Emission Unit	K	-	0	0	0	0	1			
Granular activated carbon for treatment of contaminated vapors (VGAC). Three vessels will be used in series, each containing 5,000 pounds of VGAC.										

Building Information					☐ Continuation Sheet(s)	
Building ID	Building Name			Length (ft)	Width (ft)	Orientation

Emission Unit	Emission Unit Emissions Summary					☐ Continuation Sheet(s)
K	-	0	0	0	0	1
CAS Number	Contaminant Name					
79-01-6	Trichloroethene (TCE)					
ERP (lbs/yr)	Potential to Emit			Actual Emissions		
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
16543	1.89	16543	0.014	121.0		
CAS Number	Contaminant Name					
71-55-6	1,1,1-Trichloroethane					
ERP (lbs/yr)	Potential to Emit			Actual Emissions		
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
13940	1.59	13940	0.011	94.2		
CAS Number	Contaminant Name					
75-35-4	1,1-Dichloroethene (1,1-DCE)					
ERP (lbs/yr)	Potential to Emit			Actual Emissions		
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
1118	0.13	1117	0.004	33.7		
CAS Number	Contaminant Name					
156-59-2	cis-1,2-Dichloroethene (cis-1,2 DCE)					
ERP (lbs/yr)	Potential to Emit			Actual Emissions		
	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)
44	0.00	44	0.00	1.3		

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Section IV - Emission Unit Information

Emission Unit Description										☒ Continuation Sheet(s)
Emission Unit	K	-	0	0	0	0	1			
Granular activated carbon for treatment of contaminated vapors (VGAC). Three vessels will be used in series, each containing 5,000 pounds of VGAC.										

Building Information					☐ Continuation Sheet(s)	
Building ID	Building Name			Length (ft)	Width (ft)	Orientation

Emission Unit		Emission Unit Emissions Summary				☒ Continuation Sheet(s)
K	-	0	0	0	0	1
CAS Number		Contaminant Name				
75-34-3		1,1-Dichloroethane				
ERP (lbs/yr)		Potential to Emit		Actual Emissions		
		(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)	
3.02		0.00	3.02	0.00	0.08	
CAS Number		Contaminant Name				
75-01-4		Vinyl Chloride				
ERP (lbs/yr)		Potential to Emit		Actual Emissions		
		(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)	
2.35		0.00	2.35	0.00	2.4	
CAS Number		Contaminant Name				
ERP (lbs/yr)		Potential to Emit		Actual Emissions		
		(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)	
CAS Number		Contaminant Name				
ERP (lbs/yr)		Potential to Emit		Actual Emissions		
		(lbs/hr)	(lbs/yr)	(lbs/hr)	(lbs/yr)	

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Emission Point Information							☐ Continuation Sheet(s)
Emission Point							
Ground Elevation (ft)	Height (ft)	Height Above Structure (ft)	Inside Diameter (in)	Exit Temp. (°F)	Cross Section		
					Length (in)	Width (in)	
Exit Velocity (FPS)	Exit Flow (ACFM)	NYTM (E) (KM)	NYTM (N) (KM)	Building	Distance to Property Line (ft)	Date of Removal	
Emission Point							
Ground Elevation (ft)	Height (ft)	Height Above Structure (ft)	Inside Diameter (in)	Exit Temp. (°F)	Cross Section		
					Length (in)	Width (in)	
Exit Velocity (FPS)	Exit Flow (ACFM)	NYTM (E) (KM)	NYTM (N) (KM)	Building	Distance to Property Line (ft)	Date of Removal	
Emission Point							
Ground Elevation (ft)	Height (ft)	Height Above Structure (ft)	Inside Diameter (in)	Exit Temp. (°F)	Cross Section		
					Length (in)	Width (in)	
Exit Velocity (FPS)	Exit Flow (ACFM)	NYTM (E) (KM)	NYTM (N) (KM)	Building	Distance to Property Line (ft)	Date of Removal	

Emission Source/Control Information								☐ Continuation Sheet(s)
Emission Source		Date of Construction	Date of Operation	Date of Removal	Control Type		Manufacturer's Name/Model Number	
ID	Type				Code	Description		
Design Capacity	Design Capacity Units			Waste Feed		Waste Type		
	Code	Description			Code	Description	Description	
Emission Source		Date of Construction	Date of Operation	Date of Removal	Control Type		Manufacturer's Name/Model Number	
ID	Type				Code	Description		
Design Capacity	Design Capacity Units			Waste Feed		Waste Type		
	Code	Description			Code	Description	Description	
Emission Source		Date of Construction	Date of Operation	Date of Removal	Control Type		Manufacturer's Name/Model Number	
ID	Type				Code	Description		
Design Capacity	Design Capacity Units			Waste Feed		Waste Type		
	Code	Description			Code	Description	Description	

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Process Information										☐ Continuation Sheet(s)	
Emission Unit	-									Process	GAC

Process Description

Vapors extracted from the soil are first cooled to remove as much moisture as possible from the vapor stream. After the water vapor has been separated via a moisture separator, the remaining vapors, consisting of air, water vapor, and Site contaminants of concern (TCE, 1,1,1-TCA, 1,1-DCE, c-1,2-DCE) are sent via an exhaust blower to three, 5,000-pound vapor phase granular activated carbon (VGAC) vessels plumbed in series.

All the process vapors upstream of the blower inlet will be under vacuum to eliminate the possibility of fugitive emissions. See attached process flow diagram (P101) for reference.

Source Classification Code (SCC)	Total Throughput		Throughput Quantity Units	
	Quantity/Hr	Quantity/Yr	Code	Description
2635000000		7000		
Confidential Operating at Maximum Capacity	Operating Schedule		Building	Floor/Location
	Hours/Day	Days/Year		
	24	197	N/A	Outdoors

Emission Point Identifier(s)						

Emission Source/Control Identifier(s)						

Emission Unit	-									Process			

Process Description

Source Classification Code (SCC)	Total Throughput		Throughput Quantity Units	
	Quantity/Hr	Quantity/Yr	Code	Description
Confidential Operating at Maximum Capacity	Operating Schedule		Building	Floor/Location
	Hours/Day	Days/Year		

Emission Point Identifier(s)						

Emission Source/Control Identifier(s)						

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Process Emissions Summary							Continuation Sheet(s)			
Emission Unit	K - 0 0 0 0 1						Process	G A C		
CAS Number	Contaminant Name		% Thruput	% Capture	% Control	ERP (lbs/hr)	ERP How Determined			
79-01-6	Trichloroethene			99%		1.9	Calculation			
Potential to Emit			Standard Units	Potential to Emit How Determined	Actual Emissions					
(lbs/hr)	(lbs/yr)	(standard units)			(lbs/hr)	(lbs/yr)				
1.89	16543			Calculation	0.014	121.0				
Emission Unit	-						Process			
CAS Number	Contaminant Name		% Thruput	% Capture	% Control	ERP (lbs/hr)	ERP How Determined			
71-55-6	1,1,1-Trichloroethane			99%		1.59	Calculation			
Potential to Emit			Standard Units	Potential to Emit How Determined	Actual Emissions					
(lbs/hr)	(lbs/yr)	(standard units)			(lbs/hr)	(lbs/yr)				
1.59	13940			Calculation	0.011	94.2				
Emission Unit	-						Process			
CAS Number	Contaminant Name		% Thruput	% Capture	% Control	ERP (lbs/hr)	ERP How Determined			
75-35-4	1,1-Dichloroethene			97%		0.13	Calculation			
Potential to Emit			Standard Units	Potential to Emit How Determined	Actual Emissions					
(lbs/hr)	(lbs/yr)	(standard units)			(lbs/hr)	(lbs/yr)				
0.13	1117			Calculation	0.004	33.7				

Emission Source Emissions Summary							Continuation Sheet(s)			
Emission Source	K 0 0 0 1						Process	G A C		
CAS Number	Contaminant Name		% Thruput	% Capture	% Control	ERP (lbs/hr)	ERP How Determined			
156-59-2	cis-1,2-Dichloroethene			97%		0.0	Calculation			
Potential to Emit			Standard Units	Potential to Emit How Determined	Actual Emissions					
(lbs/hr)	(lbs/yr)	(standard units)			(lbs/hr)	(lbs/yr)				
0.0	44			Calculation	0.0	1.32				
Emission Source							Process			
CAS Number	Contaminant Name		% Thruput	% Capture	% Control	ERP (lbs/hr)	ERP How Determined			
75-34-3	1,1-Dichloroethane			97%		0.0	Calculation			
Potential to Emit			Standard Units	Potential to Emit How Determined	Actual Emissions					
(lbs/hr)	(lbs/yr)	(standard units)			(lbs/hr)	(lbs/yr)				
0.0	3.02			Calculation	0.0	0.08				
Emission Source							Process			
CAS Number	Contaminant Name		% Thruput	% Capture	% Control	ERP (lbs/hr)	ERP How Determined			
75-01-4	Vinyl Chloride			0		0.0	Calculation			
Potential to Emit			Standard Units	Potential to Emit How Determined	Actual Emissions					
(lbs/hr)	(lbs/yr)	(standard units)			(lbs/hr)	(lbs/yr)				
0.0	2.4			Calculation	0.0	2.35				

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Emission Unit	Emission Point	Process	Emission Source	Emission Unit Applicable Federal Requirements							Continuation Sheet(s)		
				Title	Type	Part	Subpart	Section	Subdiv.	Parag.	Subparag.	Cl.	Subcl.

Emission Unit	Emission Point	Process	Emission Source	Emission Unit State Only Requirements							Continuation Sheet(s)		
				Title	Type	Part	Subpart	Section	Subdiv.	Parag.	Subparag.	Cl.	Subcl.

Emission Unit Compliance Certification										Continuation Sheet(s)	
Rule Citation											
Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause		
Applicable Federal Requirement				State Only Requirement				Capping			
Emission Unit		Emission Point	Process	Emission Source	CAS Number		Contaminant Name				

Monitoring Information									
Continuous Emission Monitoring				Monitoring of a Process or Control Device Parameters as a Surrogate					
* Intermittent Emission Testing				Work Practice Involving Specific Operations					
Ambient Air Monitoring				Record Keeping/Maintenance Procedures					

Compliance Activity Description

Total volatile organic contaminant (VOC) concentrations will regularly be monitored using a handheld photo ionization detector (PID) at various locations (influent to the VGAC treatment train, effluent to the primary and effluent to the secondary VGAC vessels, and effluent from the VGAC treatment train). Analytical samples will also be collected regularly at the influent to and effluent from the VGAC treatment train. Analytical samples will be analyzed for EPA Method TO-15.

Work Practice Type Code	Process Material			Reference Test Method	
	Code	Description			
Monitored Parameter				Manufacturer's Name/Model Number	
Code	Description				
Limit		Limit Units			
Upper	Lower	Code	Description		
Averaging Method		Monitoring Frequency		Reporting Requirements	
Code	Description	Code	Description	Code	Description

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Determination of Non-Applicability (Title V Applications Only) ☐ Continuation Sheet(s)

Rule Citation									
Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
Emission Unit	Emission Point	Process	Emission Source	Applicable Federal Requirement State Only Requirement					

Non-Applicability Description

Rule Citation									
Title	Type	Part	Subpart	Section	Subdivision	Paragraph	Subparagraph	Clause	Subclause
Emission Unit	Emission Point	Process	Emission Source	Applicable Federal Requirement State Only Requirement					

Non-Applicability Description

Compliance Plan ☐ Continuation Sheet(s)

For any emission units which are not in compliance at the time of permit application, the applicant shall complete the following:

Consent Order		Certified progress reports are to be submitted every 6 months beginning / /

Emission Unit	Process	Emission Source	Applicable Federal Requirement									
Title	Type	Part	Subpart	Section	Subdiv.	Parag.	Subparag.	Clause	Subcl.			

Remedial Measures and Intermediate Milestones							R/I	Date Scheduled

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Request for Emission Reduction Credits ☐ Continuation Sheet(s)

Emission Source					

Emission Reduction Description

Contaminant Emission Reduction Data

Baseline Period ____/____/____ to ____/____/____		Reduction	
		Date	Method
CAS Number	Contaminant Name	ERC (lbs/yr)	
		Netting	Offset

Facility to Use Future Reduction

Name		Application ID													
		-						-				/			
Location Address															
City/ Town / Village										State			Zip		

Use of Emission Reduction Credits ☐ Continuation Sheet(s)

Emission Source					

Proposed Project Description

Contaminant Emissions Increase Data

CAS Number	Contaminant Name	Project Emission Potential (lbs/yr)

Statement of Compliance

All facilities under the ownership of this "owner/firm" are operating in compliance with all applicable requirements and state regulations including any compliance certification requirements under Section 114(a)(3) of the Clean Air Act Amendments of 1990, or are meeting the schedule of a consent order.

Source of Emission Reduction Credit - Facility

Name		Permit ID													
		-						-				/			
Location Address															
City/ Town / Village										State			Zip		

Emission Source	CAS Number	Contaminant Name	ERC (lbs/yr)	
			Netting	Offset

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Supporting Documentation and Attachments	
Required Supporting Documentation	Date of Document
☐ List of Exempt Activities (attach form)	
☒ Plot Plan	03/04/2022
☒ Process Flow Diagram	03/04/2022
Methods Used to Determine Compliance (attach form)	
☒ Emissions Calculations	06/29/2022
Optional Supporting Documentation	Date of Document
Air Quality Model	
☐ Confidentiality Justification	
☐ Ambient Air Quality Monitoring Plan or Reports	
Stack Test Protocol	
Stack Test Report	
☐ Continuous Emissions Monitoring Plan	
Lowest Achievable Emission Rate (LAER) Demonstration	
Best Available Control Technology (BACT) Demonstration	
☐ Reasonably Available Control Technology (RACT) Demonstration	
Toxic Impact Assessment (TIA)	
Environmental Rating Demonstration	
☐ Operational Flexibility Protocol/Description of Alternate Operating Scenarios	
Title IV Permit Application	
Emission Reduction Credit (ERC) Quantification (attach form)	
Baseline Period Demonstration	
Use of Emission Reduction Credits (attach form)	
☐ Analysis of Contemporaneous Emissions Increase/Decrease	
Other Supporting Documentation	Date of Document

1. THE BASE MAP WAS DRAWN FROM A PLAN ENTITLED, "CURRENT SITE COVER", PREPARED BY GHD, AND WAS RECEIVED ELECTRONICALLY ON NOVEMBER 16, 2021 WITH AN ORIGINAL SCALE: 1" = 50'.

H I

ISTD HEATERS (H) (80)
(D) TARGET TREATMENT DEPTH



VAPOR EXTRACTION WELLS (V) (5)

TEMPERATURE MONITORING POINTS (T) (8)

① PRESSURE MONITORING POINTS (P) (4)

HORIZONTAL VAPOR EXTRACTION WELL

THERMAL TREATMENT ZONE (TTZ)

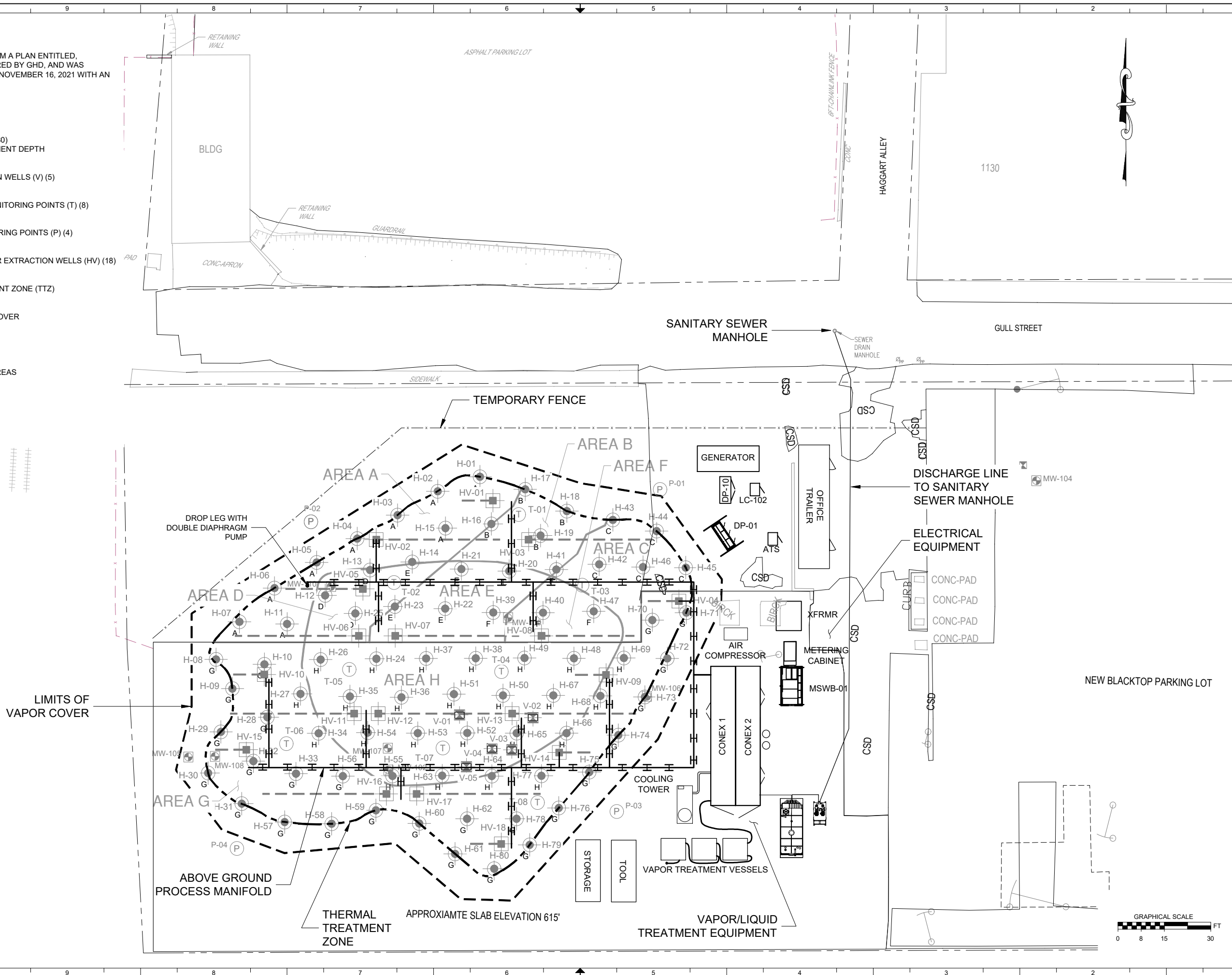
LIMITS OF VAPOR COVER

☐ ABANDONED PITS

TREATMENT SUB AREAS

 VAPOR PIPING

T PIPE STANDS (70)



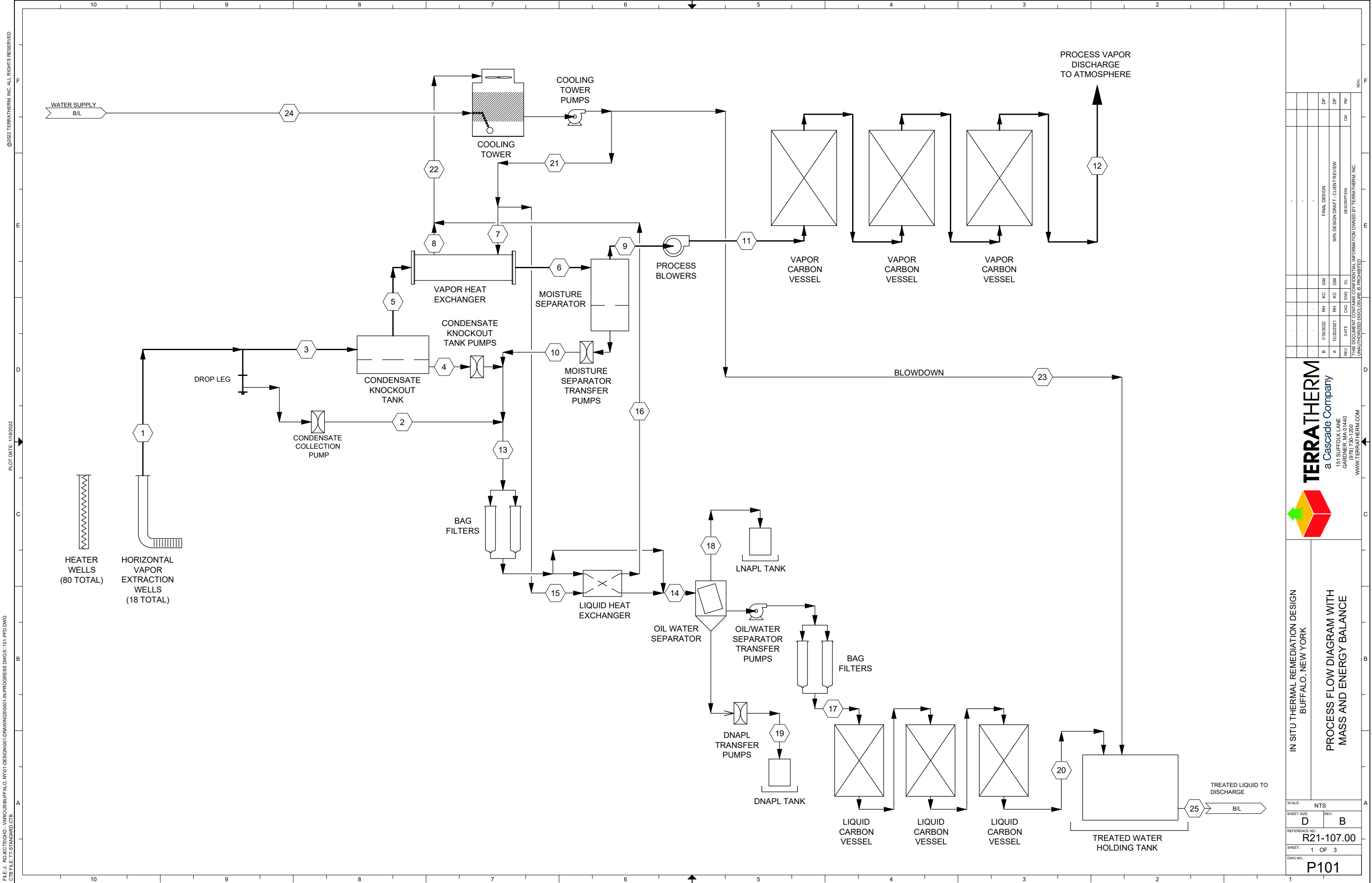
TERRATHERM
a Cascade Company



IN SITU THERMAL REMEDIATION DESIGN
BUFFALO, NEW YORK

MECHANICAL LAYOUT

SCALE: AS SHOWN	
SHEET SIZE: D	REV:
REFERENCE NO.: R21-10	
SHEET: 1 OF 1	
DWG NO.: M10	



		VGAC
Inlet Flow	ACFM	520
	lb/hr	2,016
Uncontrolled Peak COC Mass in Vapor Stream	lb/hr	3.61
	%	0.038
Inlet Temperature	°F	150
Inlet Pressure	in WC	16
Outlet Flow	ACFM	522
	lb/hr	2,012
Outlet Temperature	°F	130
Outlet Pressure	in WC	1
Operation Length	Days	197
Total Mass	lbs	6,972

COCs	Mass Estimate (lbs.)	Groundwater (µg/L)			Soil (µg/kg)		
		Max Level Detected	Average	Target Level	Max Level Detected	Average	Target Level
Trichloroethene	6,972	280,000	46,300	NA	3,400,000	197,000	1
Cis-1,2-dichloroethene		82,000	6,900	NA	5,300	520	
1,1-Dichloroethene		43,000	3,900	NA	190,000	13,300	
1,1,1-Trichloroethane		490,000	30,900	NA	7,900,000	166,000	
1,1-Dichloroethane		3,700	500	NA	430	36	
Vinyl Chloride		98	-	NA	34	28	

Constituent		MW	Soil Concentration	Mass Fraction	Mole Fraction	Uncontrolled					Controlled					DRE ²
						Peak		Average	Annualized ¹		Peak		Average	Annualized ¹		
			µg/kg			ppmv	lb/hr	lb/hr	ton/yr	lb/yr	ppmv	lb/hr	lb/hr	ton/yr	lb/yr	%
Trichloroethene	HTAC MEL = 500	131.39	197,000	52.27%	51.93%	197	1.89	0.77	8.27	16,543	1.44	1.38E-02	5.64E-03	0.06	121.00	99.3%
cis-1,2-Dichloroethene		96.94	520	0.14%	0.19%	0.7	0.00	0.00	0.02	44	0.02	1.50E-04	6.13E-05	0.00	1.32	97.0%
1,1-Dichloroethene	> 100 lb/yr	96.94	13,300	3.53%	4.75%	18	0.13	0.05	0.56	1,117	0.54	3.84E-03	1.57E-03	0.02	33.65	97.0%
1,1,1-Trichloroethane		133.40	166,000	44.05%	43.10%	164	1.59	0.65	6.97	13,940	1.11	1.08E-02	4.39E-03	0.05	94.21	99.3%
1,1-Dichloroethane		98.96	36	0.01%	0.01%	0.05	0.00	0.00	0.00	3.02	0.00	9.52E-06	3.88E-06	0.00	0.08	97.2%
Vinyl chloride	HTAC MEL = 100	62.50	28	0.007%	0.016%	0.06	0.00	0.00	0.00	2.35	0.06	2.68E-04	1.10E-04	0.00	2.35	0.0%
Total				100%	100%	380	3.61	1.47	15.82	31,648	3.17	0.03	0.01	0.13	252.6	

¹Annualized emissions are based on peak daily emissions rates assuming total in situ mass estimate collected in vapor and extended to a period of 1 year.

²DRE values are derived based on operational observations.

The analysis provided meets the 'Guidance on Air Emissions of VOCs at DER Remediation Sites':

- Trichloroethene, a HTAC, PTE (16,543 lb/yr) > 500 lb/yr MEL and thus requires treatment. Controlled emissions, ~121 lb/yr, are less than the MEL = OK
- cis-1,2-Dichloroethene is a non-HTAC,
- 1,1-Dichloroethene, is a non-HTAC, PTE (1117 lb/yr > 100 lb/yr (Pt 212)
- 1,1,1-Trichloroethane, is a non-HTAC, PTE (13,940 lb/yr) > 100 lb/y (Pt 212)
- 1,1-Dichloroethane, is a non-HTAC
- Vinyl chloride, a HTAC, PTE (2.35 lb/yr) < MEL (100 lb/yr), no controls needed

Total VOC PTE (3.61 lb/hr) > 0.5 lb/hr (DER), therefore all VOC's need emission controls. Activated carbon controls are used. Post control VOC emissions = 0.03 lb/hr & 253 lb/yr. This is satisfactory.

1.89 x 8760 = 16,554 x (1-0.993) [0.007] = 115.88 lb/yr

Air Permit Calculations and Assumptions.

TerraTherm's air permit calculations are based on:

- site data provided by GHD,
- thermal modeling performed by TerraTherm, and
- assumptions made based on observed operational data from other thermal projects.

TerraTherm utilized the average soil concentration data for each constituent of concern (COC) provided by GHD and applied it to the design volume of the target treatment zone to get the total COC mass estimate of 6,972 pounds (lbs).

TerraTherm also performed a subsurface simulation that modeled the steam and non-condensable vapor extraction from the subsurface based on the geological and hydrogeological properties of the soil provided by GHD (e.g., geology type, porosity, saturation, bulk density, thermal conductivity, hydraulic conductivity, hydraulic gradient, and groundwater influx). These modeled extraction parameters represent the conditions of the vapor entering the treatment system (i.e., flow rate, relative humidity, and temperature). The site mass estimate of 6,972 lbs was then used to calculate a peak mass removal rate of 3.61 lbs/hr, which is simply the average mass removal rate over the 197-day operating period, adjusted by a multiplier that has been developed by TerraTherm based on historical ISTR operational data. Using the soil concentration data provided by GHD, mass fractions for each of the constituents of concern (COCs) were calculated.

TerraTherm also completed a standard mass and energy balance (included with Drawing P101 – Process Flow Diagram), which is used to model the changes in enthalpy and mass loading throughout the treatment system. The mass and energy balance modeled the flow rate and process conditions of the stream that is entering the vapor carbon vessels, which is represented as the uncontrolled concentrations in the air permit calculations.

Based on analytical data for individual COCs collected from other sites, TerraTherm has developed approximate destruction removal efficiencies (DRE) for each of the COCs through the carbon vessels. These DREs are used to effectively calculate the controlled emissions leaving the system post-carbon both at the anticipated peak mass removal rate and the average mass removal rate from the subsurface. The average DRE through vapor carbon is expected to be approximately 98% for the primary site COCs. With the DRE values applied, the calculations render the expected concentration and emissions rate for each of the site COCs and annual emissions for each COC are then calculated based on peak conditions.



STREAM NUMBER:		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
STREAM ID:		WELLFIELD INFLUENT TO SEPARATOR S-100	SEPARATOR S-100 CONDENSATE	WELLFIELD INFLUENT TO VAPOR TREATMENT	SEPARATOR S-101 CONDENSATE	HEX E-101A/B INLET	HEX E-101A/B OUTLET	COOLING WATER SUPPLY TO E-101A/B	COOLING WATER RETURN FROM E-101A/B	SEPARATOR S-102 OUTLET VAPOR	SPEARATOR S-102 CONDENSATE	VACUUM BLOWER B-101A/B OUTLET	STACK OUTLET VAPOR	HEX E-201 INLET	HEX E-201 OUTLET	COOLING WATER SUPPLY TO E-201	COOLING WATER RETURN FROM E-201	LIQUID CARBON LGAC-201-1/2 INLET	DISCHARGE TO LNAPL TANK	DISCHARGE TO DNAPL TANK	TREATED LIQUID TO DISCHARGE
Temperature (°F)		185	185	185	185	185	120	82	92	120	120	150	130	120	100	82	92	100	100	100	100
PressureVap (in wc ga)		-20		-22		-26	-29			-32		16	1								
PressureVap (in wc abs)		387				381	378			375	48	423	408								
PressureLiq (psig)								40	40					38	36	40	40	40			35
Relative Humidity						0.52	1.00			0.99		0.44	0.80								
Vapor																					
Non-condensables																					
Molar (lbmol/hr)		64		64		64	64			64		64	64								
Mass (lb/hr)		1,850		1,850		1,850	1,850			1,850		1,850	1,850								
SCFM (1 atm, 68°F)		410		410		410	410			410		410	410								
SCFM N2		324		324		324	324			324		324	324								
SCFM O2		86		86		86	86			86		86	86								
ACFM		527		529		535	485			489		456	457								
Volume %		55%		55%		55%	88%			88%		88%	88%								
Water																					
Molar (lbmol/hr)		51		51		51	9			9		9	9								
Mass (lb/hr)		926		926		926	163			163		163	163								
SCFM (1 atm, 68°F)		330		330		330	58			58		58	58								
ACFM		424		426		431	69			69		64	65								
Volume %		45%		45%		45%	12.4%			12.4%		12.4%	12.4%								
COC																					
Molar (lbmol/hr)		0.03		0.03		0.03	0.03			0.03		0.03	0.00								
Mass (lb/hr)		4.42		4.42		4.42	4.42			4.34		4.34	0.04								
SCFM (1 atm, 68°F)		0.22		0.22		0.22	0.22			0.21		0.21	0.00								
ACFM		0.28		0.28		0.28	0.26			0.25		0.24	0.00								
Volume %		0.03%		0.03%		0.03%	0.05%			0.05%		0.05%	0.00%								
Total Vapor																					
Molar (lbmol/hr)		115		115		115	73			73		73	73								
Mass (lb/hr)		2,780		2,780		2,780	2,017			2,017		2,017	2,012								
SCFM (1 atm, 68°F)		740		740		740	468			468		468	468								
ACFM		951		956		966	554			558		520	522								
Enthalpy (BTU/hr)		1,137,867		1,137,867		1,137,867	234,064			234,064		249,713	239,275								
dH (BTU/hr)							812,201														
Liquid																					
Water																					
Molar (lbmol/hr)			0		0		42	4,507	4,507		42			42	42	85	85	42			42
Mass (lb/hr)			0		0		763	81,220	81,220		763			763	763	1,527	1,527	763			763
GPM			0.00		0.00		1.53	162.31	162.31		1.53			1.53	1.53	3.05	3.05	1.53			1.53
Enthalpy (BTU/hr)			0		0		91,601	6,660,048	7,472,249		91,601			91,601	76,334	125,188	140,455	76,334			76,334
dH (BTU/hr)									812,201						15,267		15,267				
COC																					
Mass (lb/hr)			0.00		0.00		0.00				0.09			0.09	0.09			0.09	0.00	0.00	0.00
Concentration (mg/L)			0.00		0.00		0.00				115.85			115.85	115.85			115.85			1.16
Total Liquid (lb/hr)			0		0		763	81,220	81,220		763			763	763	1,527	1,527	763	0	0	763

STREAM NUMBER:		21	22	23	24	25
STREAM ID:		TOTAL COOLING WATER SUPPLY	TOTAL COOLING WATER RETURN	COOLING TOWER BLOWDOWN (TO DISCHARGE)	COOLING TOWER MAKEUP WATER	TOTAL LIQUID DISCHARGE TO SEWER
Temperature (°F)		82	92	82	60	89
PressureVap (in wc ga)						
PressureVap (in wc abs)						
PressureLiq (psig)				60	35	36
Relative Humidity						
Vapor						
Non-condensables						
Molar (lbmol/hr)						
Mass (lb/hr)						
SCFM (1 atm, 68°F)						
SCFM N2						
SCFM O2						
ACFM						
Volume %						
Water						
Molar (lbmol/hr)						
Mass (lb/hr)						
SCFM (1 atm, 68°F)						
ACFM						
Volume %						
COC						
Molar (lbmol/hr)						
Mass (lb/hr)						
SCFM (1 atm, 68°F)						
ACFM						
Volume %						
Total Vapor						
Molar (lbmol/hr)						
Mass (lb/hr)						
SCFM (1 atm, 68°F)						
ACFM						
Enthalpy (BTU/hr)						
dH (BTU/hr)						
Liquid						
Water						
Molar (lbmol/hr)		4,592	4,592	67	212	110
Mass (lb/hr)		82,747	82,747	1,214	3,820	1,977
GPM		165.36	165.36	2.43	7.63	3.95
Enthalpy (BTU/hr)		6,785,237	7,612,705			
dH (BTU/hr)			827,468			
COC						
Mass (lb/hr)						
Concentration (mg/L)						
Total Liquid (lb/hr)		82,747	82,747	1,214	3,820	1,977

Attachment E – Proposed ISTR Sampling Schedule

Draft Field Sampling Schedule - 01/13/2022
1130 Niagara St.
Buffalo, NY



			Influent Vapor		Intermediate Vapor		Effluent Vapor		Process Liquid*	
			VGAC Influent		VGAC Midfluent 1	VGAC Midfluent 2	STACK		LGAC Influent	LGAC Effluent
			EPA TO-15	PID	PID	PID	EPA TO-15	PID	EPA 8260C	Metals, Mercury, Ammonia, PCBs, BNA/SVOCs, 8260/624 VOCs, EPA 1664A, TSS, TDS, BOD, Phosphates, Sulfide, Cyanide, Oil&Grease, pH
			Summa Canister	Tedlar Bag	Tedlar bag	Tedlar Bag	Summa Canister	Tedlar Bag	40mL VOA Vial (Lab Supplied)	Various (Lab Supplied)
Phase	Number of Operating Days	Day	Every other week	Weekdays	Weekdays	Weekdays	Monthly	Weekdays	Every other week	Monthly
Shakedown	0	Tuesday								
Heating to Target Temperature (101 days)	1	Wednesday	X	X	X	X	X	X	X	X
	2	Thursday		X	X	X		X		
	3	Friday		X	X	X		X		
	4	Saturday								
	5	Sunday								
	6	Monday		X	X	X		X		
	7	Tuesday		X	X	X		X		
	8	Wednesday		X	X	X		X		
	9	Thursday		X	X	X		X		
	10	Friday		X	X	X		X		
	11	Saturday								
	12	Sunday								
	13	Monday		X	X	X		X		
	14	Tuesday		X	X	X		X		
	15	Wednesday	X	X	X	X		X	X	
	16	Thursday		X	X	X		X		
	17	Friday		X	X	X		X		
	18	Saturday								
	19	Sunday								
	20	Monday		X	X	X		X		
	21	Tuesday		X	X	X		X		
	22	Wednesday		X	X	X		X		
	23	Thursday		X	X	X		X		
	24	Friday		X	X	X		X		
	25	Saturday								
	26	Sunday								
	27	Monday		X	X	X		X		
	28	Tuesday		X	X	X		X		
	29	Wednesday	X	X	X	X	X	X	X	X
	30	Thursday		X	X	X		X		
	31	Friday		X	X	X		X		
	32	Saturday								
	33	Sunday								
	34	Monday		X	X	X		X		
	35	Tuesday		X	X	X		X		
	36	Wednesday		X	X	X		X		
	37	Thursday		X	X	X		X		
	38	Friday		X	X	X		X		
	39	Saturday								
	40	Sunday								
	41	Monday		X	X	X		X		
	42	Tuesday		X	X	X		X		
	43	Wednesday	X	X	X	X		X	X	
	44	Thursday		X	X	X		X		
	45	Friday		X	X	X		X		
	46	Saturday								
	47	Sunday								
	48	Monday		X	X	X		X		
	49	Tuesday		X	X	X		X		
	50	Wednesday		X	X	X		X		
	51	Thursday		X	X	X		X		
	52	Friday		X	X	X		X		
	53	Saturday								
	54	Sunday								
	55	Monday		X	X	X		X		
	56	Tuesday		X	X	X		X		
	57	Wednesday	X	X	X	X	X	X	X	X
	58	Thursday		X	X	X		X		
	59	Friday		X	X	X		X		
	60	Saturday								
	61	Sunday								
	62	Monday		X	X	X		X		
	63	Tuesday		X	X	X		X		
	64	Wednesday		X	X	X		X		
	65	Thursday		X	X	X		X		
	66	Friday		X	X	X		X		
	67	Saturday								
	68	Sunday								
	69	Monday		X	X	X		X		
	70	Tuesday		X	X	X		X		
	71	Wednesday	X	X	X	X		X	X	
	72	Thursday		X	X	X		X		
	73	Friday		X	X	X		X		
	74	Saturday								
	75	Sunday								
	76	Monday		X	X	X		X		
	77	Tuesday		X	X	X		X		
	78	Wednesday		X	X	X		X		
	79	Thursday		X	X	X		X		
	80	Friday		X	X	X		X		
	81	Saturday								
	82	Sunday								
	83	Monday		X	X	X		X		
	84	Tuesday		X	X	X		X		
	85	Wednesday	X	X	X	X	X	X	X	X
	86	Thursday		X	X	X		X		
	87	Friday		X	X	X		X		
	88	Saturday								
	89	Sunday								
	90	Monday		X	X	X		X		
	91	Tuesday		X	X	X		X		
	92	Wednesday		X	X	X		X		
	93	Thursday		X	X	X		X		
	94	Friday		X	X	X		X		
	95	Saturday								
	96	Sunday								
	97	Monday		X	X	X		X		
	98	Tuesday		X	X	X		X		
	99	Wednesday	X	X	X	X		X	X	
	100	Thursday		X	X	X		X		
	101	Friday		X	X	X		X		
	102	Saturday								
	103	Sunday								
	104	Monday		X	X	X		X		
	105	Tuesday		X	X	X		X		
	106	Wednesday		X	X	X		X		
	107	Thursday		X	X	X		X		
	108	Friday		X	X	X		X		
	109	Saturday								
	110	Sunday								
	111	Monday		X	X	X		X		
	112	Tuesday		X	X	X		X		
	113	Wednesday	X	X	X	X	X	X	X	X
	114	Thursday		X	X	X		X		
	115	Friday		X	X	X		X		
	116	Saturday								
	117	Sunday								
	118	Monday		X	X	X		X		
	119	Tuesday		X	X	X		X		
	120	Wednesday		X	X	X		X		
	121	Thursday		X	X	X		X		
	122	Friday		X	X	X		X		
	123	Saturday								
	124	Sunday								
	125	Monday		X	X	X		X		
	126	Tuesday		X	X	X		X		
	127	Wednesday	X	X	X	X		X	X	
	128	Thursday		X	X	X		X		
	129	Friday		X	X	X		X		

Draft Field Sampling Schedule - 01/13/2022
1144 Niagara St.
Buffalo, NY



			Influent Vapor		Intermediate Vapor		Effluent Vapor		Process Liquid*	
			VGAC Influent		VGAC Midfluent 1	VGAC Midfluent 2	STACK		LGAC Influent	LGAC Effluent
			EPA TO-15	PID	PID	PID	EPA TO-15	PID	EPA 8260C	Metals, Mercury, Ammonia, PCBs, BNA/SVOCs, 8260/624 VOCs, EPA 1664A, TSS, TDS, BOD, Phosphates, Sulfide, Cyanide, Oil&Grease, pH
			Summa Canister	Tedlar Bag	Tedlar bag	Tedlar Bag	Summa Canister	Tedlar Bag	40mL VOA Vial (Lab Supplied)	Various (Lab Supplied)
Phase	Number of Operating Days	Day	Every other week	Weekdays	Weekdays	Weekdays	Monthly	Weekdays	Every other week	Monthly
Heating at Target Temperature (88 days)	130	Saturday								
	131	Sunday								
	132	Monday		X	X	X		X		
	133	Tuesday		X	X	X		X		
	134	Wednesday		X	X	X		X		
	135	Thursday		X	X	X		X		
	136	Friday		X	X	X		X		
	137	Saturday								
	138	Sunday								
	139	Monday		X	X	X		X		
	140	Tuesday		X	X	X		X		
	141	Wednesday	X	X	X	X	X	X	X	X
	142	Thursday		X	X	X		X		
	143	Friday		X	X	X		X		
	144	Saturday								
	145	Sunday								
	146	Monday		X	X	X		X		
	147	Tuesday		X	X	X		X		
	148	Wednesday		X	X	X		X		
	149	Thursday		X	X	X		X		
	150	Friday		X	X	X		X		
	151	Saturday								
	152	Sunday								
	153	Monday		X	X	X		X		
	154	Tuesday		X	X	X		X		
	155	Wednesday	X	X	X	X		X	X	
	156	Thursday		X	X	X		X		
	157	Friday		X	X	X		X		
	158	Saturday								
	159	Sunday								
	160	Monday		X	X	X		X		
	161	Tuesday		X	X	X		X		
	162	Wednesday		X	X	X		X		
	163	Thursday		X	X	X		X		
	164	Friday		X	X	X		X		
	165	Saturday								
	166	Sunday								
	167	Monday		X	X	X		X		
	168	Tuesday		X	X	X		X		
	169	Wednesday	X	X	X	X	X	X	X	X
	170	Thursday		X	X	X		X		
	171	Friday		X	X	X		X		
	172	Saturday								
	173	Sunday								
	174	Monday		X	X	X		X		
	175	Tuesday		X	X	X		X		
	176	Wednesday		X	X	X		X		
	177	Thursday		X	X	X		X		
	178	Friday		X	X	X		X		
	179	Saturday								
	180	Sunday								
	181	Monday		X	X	X		X		
	182	Tuesday		X	X	X		X		
	183	Wednesday	X	X	X	X		X	X	
	184	Thursday		X	X	X		X		
	185	Friday		X	X	X		X		
	186	Saturday								
	187	Sunday								
	188	Monday		X	X	X		X		
	189	Tuesday		X	X	X		X		
Initial Cool Down (7 days)	190	Wednesday		X	X	X		X		
	191	Thursday		X	X	X		X		
	192	Friday		X	X	X		X		
	193	Saturday								
	194	Sunday								
	195	Monday		X	X	X		X		
	196	Tuesday		X	X	X		X		

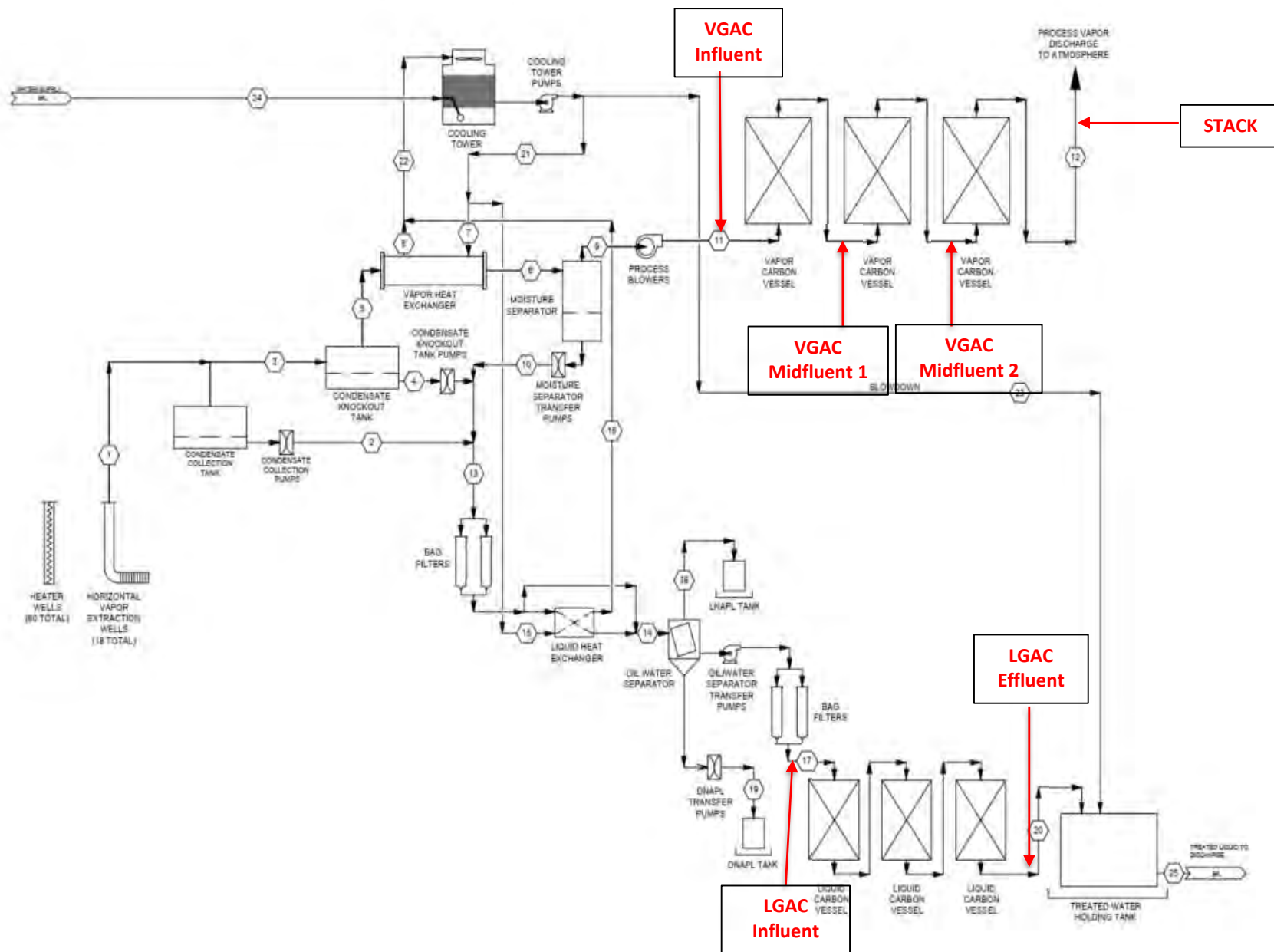
Total number of samples: 14 7 14 7

*First sampling of process liquid dependent on flow through treatment system.

Draft Field Sampling: Locations - 01/13/202

1130 Niagara St.

Buffalo, NY



Attachment F – ISTR Implementation Schedule

TerraTherm, Inc.

Implementation Schedule
In Situ Thermal Remediation
1144 Niagara Street Site, Buffalo, NY

D	Task Name	Duration	Start	Finish	2022												2023															
					Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep					
1	Notice of Award	0 days	Thu 11/11/21	Thu 11/11/21																												
2	Provide Project Specific COI	1 day	Mon 11/22/21	Mon 11/22/21																												
3	Project Planning	64 days	Thu 11/11/21	Tue 2/8/22																												
4	Draft Health and Safety Plan (HASP)	28 days	Thu 11/11/21	Mon 12/20/21																												
5	Draft Work Plan	28 days	Thu 11/11/21	Mon 12/20/21																												
6	HASP and Work Plan Review	20 days	Tue 12/21/21	Mon 1/17/22																												
7	Final HASP	10 days	Tue 1/18/22	Mon 1/31/22																												
8	Final Work Plan	10 days	Tue 1/18/22	Mon 1/31/22																												
9	Pre-Construction Meeting	1 day	Tue 2/8/22	Tue 2/8/22																												
10	Field Implementation	129 days	Tue 2/8/22	Fri 8/5/22																												
11	Weekly Construction Progress Meetings	48 days	Tue 2/8/22	Thu 4/14/22																												
12	Mobilization	3 days	Tue 2/8/22	Thu 2/10/22																												
13	Utility Markings	1 day	Tue 2/8/22	Tue 2/8/22																												
14	Well Installation	6 wks	Mon 2/14/22	Fri 3/25/22																												
15	Vapor Cover	2 wks	Mon 3/28/22	Fri 4/8/22																												
16	Wellfield Piping	1 wk	Mon 4/4/22	Fri 4/8/22																												
17	Wellfield Wiring	1 wk	Mon 4/11/22	Fri 4/15/22																												
18	Process Equipment and Piping	4 wks	Mon 3/21/22	Fri 4/15/22																												
19	Standby for National Grid	5 wks	Mon 4/18/22	Fri 5/20/22																												
20	Electrical Installation	7 wks	Mon 5/23/22	Fri 7/8/22																												
21	Inspections	3 wks	Mon 7/11/22	Fri 7/29/22																												
22	Commissioning	1 wk	Mon 8/1/22	Fri 8/5/22																												
23	Thermal Treatment Operations	197 days	Mon 8/8/22	Mon 2/20/23																												
24	Monthly Operational Progress Reports	197 days	Mon 8/8/22	Mon 2/20/23																												
25	Shakedown	1 day	Mon 8/8/22	Mon 8/8/22																												
26	Heating to Target Temperature	119 days	Tue 8/9/22	Mon 12/5/22																												
27	Maintaining Target Temperature	70 days	Tue 12/6/22	Mon 2/13/23																												
28	Sampling/Analysis Phase	21 days	Tue 1/24/23	Mon 2/13/23																												
29	Post Treatment Vapor Extraction	7 days	Tue 2/14/23	Mon 2/20/23																												
30	Demobilization and Site Restoration	5 wks	Tue 2/21/23	Mon 3/27/23																												
31	Final Report	45 days	Tue 3/28/23	Mon 5/29/23																												

Project: GHD_Jenesis Developm
Date: Tue 7/12/22

Task

Split

Milestone

Summary

Project Summary

Inactive Task

◆

Inactive Milestone

Inactive Summary

Manual Task

Duration-only

◆

Manual Summary Rollup

Manual Summary

Start-only

Finish-only

External Tasks

External Milestone

[

Deadline

]

Progress

Manual Progress

◆

Page 1

Appendix D

Health and Safety Plan



Site-Specific Health and Safety Plan

1130 Niagara Street Site Remediation

Jenesis Development, LLC

January 26 2022
11219347|20/30|–
Approval Date: 1-26-2022

HEALTH AND SAFETY PLAN

Signature page

This HASP was electronically signed by the Project Manager and Safety Group within the HASP Builder Software.
Fully approved HASP is printed without a DRAFT watermark.

Project Name: 1130 Niagara Street Site Remediation

Project Manager Approval Date: Katherine (kathy) Galanti, 1-26-2022

Safety Group Approval Date: John Maurer, 1-26-2022

Project Number: 11219347

Emergency Information

1130 Niagara Street Buffalo

Contact	Phone Number	
Local Police City of Buffalo Police Department 669 Hertle Ave Buffalo, New York United States 14207	911	
Fire Department City of Buffalo Fire Department 500 Rhode Island Street Buffalo, New York United States 14213	911	
Ambulance AMR WNY 481 William Gaiter Pkwy Buffalo, New York United States 14215	911 716-882-8400	
Local Hospital Buffalo General Hospital 100 High Street Buffalo, New York United States 14203	716-859-5600	
National Poison Center		GHD - HSE Help Line
Project Manager Katherine (kathy) Galanti	Work: 716-362-8839 Cell: 716-583-5720	Please call (866) 529-4886 and provide: • Name and location of caller • Description of incident • Name of injured person(s) • Description of injuries • Phone number for return call
Site Supervisor TBD	Work: TBD Cell: TBD	
GHD Regional S&H Manager John Maurer	Work: 716-297-6150 Cell: 716-545-0112	
Client Contact Darryl Burgess	Darryl Burgess	
Client Site Contact Darryl Burgess	Work: 716-878-8106 Cell: 716-864-9094	
Other Contact Katherine Galanti	Work: 716-362-8839 Cell: 716-583-5720	
Site Health Officer	Phone:	
Person to verify hospital route:	Signature:	

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Appendix

Chemical Table

Appendix A - GHD Mandatory Documents

Table 2 Chemical Action Levels

GHD COVID-19 Guidance Documents

GHD Project Site COVID-19 Screening Questionnaire
Tailgate Safety Meeting - Large
Tailgate Safety Meeting - Small
QSF-006 - Management of Change
QSF-019 Underground Utilities Checklist
HASP Amendment Form
HASP Acknowledgement Sheet

Appendix B - JSAs

Surveying-Land Surveying
Mobilization-Demobilization
Environmental-Site Recon and Walkthrough
Construction Oversight
1 JSA-Construction-Mobile Equipment-General.pdf
2 JSA-Construction Oversight-Rev. 0.pdf
3 JSA-Driving-Mobilization-Demobilization-Rev. 0.pdf
Environmental-Decontamination of Sampling Equipment and Personnel
(PPE Level D)
Environmental-Soil Sampling
Environmental-Drum Sampling for Non Hazardous Material
Remediation-Derived Waste Drum Moving and Handling
Environmental-Plugging and Abandoning
Environmental- Monitoring Well Sampling
Environmental-Oversight of Monitoring Well Installation and/or Soil
Boring
Motor Vehicle - Driving

Appendix C - Safety Data Sheets (SDS)

Alconox SDS

Appendix D - Training Records

Record of Training Form

Other

COMMUNITY AIR MONITORING PLAN

1. Introduction

1.1 GHD Values and Integrity Management Policy

At GHD, we commit to safe, ethical and respectful business behaviour in regard to both the internal conduct of our business and our engagement with external stakeholders and the public. The core values of Safety, Teamwork, Respect and Integrity will guide all of our activities. We will only seek work and participate in business transactions under high standards of corporate ethics and with complete integrity. Our projects will be undertaken in a manner that places safety as the top priority, with each of our employees empowered with Stop Work Authority throughout the execution of project work. GHD expects that all of its projects will be undertaken in an environment of teamwork and mutual respect, free from discrimination, harassment, bullying or other inappropriate behavior. We foster an open environment in which our people can report any improper practices or behaviour without fear of reprisal. All reported incidents will be investigated promptly with appropriate and equitable follow-up. GHD's integrity management policy and guidelines are available at <http://www.ghdcanada.com/global/about-us/integrity-management>.

1.2 Purpose

The purpose of this site specific health and safety plan (HASP) is to provide guidelines and establish procedures for reducing and controlling hazard exposure to the public, property, and personnel. The HASP is a living document and must continually evolve as site conditions and knowledge of the site activities develop.

This document has been developed to meet or exceed the requirements set forth by federal, state, and provincial legislation. If any procedure outlined in this plan conflicts with federal, state/provincial, and/or municipal law, prescribed standards, or client requirements, then the most stringent set of standards applies.

1.3 Stop Work Authority

All employees are empowered and expected to stop the work of coworkers, subcontractors, client employees, or other contractors if any person's safety or the environment are at risk. No repercussions will result from this action. Reporting of unsafe acts/condition (UA or UC) or Stop Work Authority (SWA) is completed with BWISE and/or the GHD HSE app. Unsafe acts, conditions, stop work authority are now reported via the GHD HSE app.

The discovery of any condition that would suggest the existence of a situation more hazardous than anticipated results in the removal of site personnel from that area and re-evaluation of the hazard and the levels of protection.

1.4 Short Service Employee

The Employee is considered a Short Service Employee (SSE) if he/she has less than 6 months experience with his/her present employer, or in his/her present role. The individual is required to wear a fluorescent orange hardhat, as an obvious indicator of SSE status. Training and mentoring allows them to gain knowledge and experience in procedures and methods. In order for a new employee to work in the field, the following minimum training requirements must be met:

1. GHD New Employee Safety & Health Orientation training (on-line).
2. GHD HAZCOM (US)/WHIMIS (Canada)(on-line).
3. On-boarding completed with Human Resources.
4. Compliance training defined on the QSF-20 as it applies to field work to be conducted.
5. Client specific safety training.

A SSE's primary mentor is their direct Supervisor. GHD Supervisors are responsible for ensuring that a SSE completes the safety, field method, and quality training as appropriate to the work they are assigned. A SSE requires an On-site Mentor for all fieldwork. The On-site Mentor must have experience in the work they are mentoring and they are responsible for the close monitoring of the SSE.

Project team SSE make-up requirements are:

- A one-person project team cannot be a SSE.
- A two-person to four-person project team can have only one SSE.
- A five-person or more project team cannot have more than 20 percent SSE without a written variance from the GHD Corporate Manager of Safety & Health.

New hire employees that can provide sufficient documentation supporting previous experience in working under HSE program(s) similar to GHD's may be exempt from GHD's SSE program. These exemptions are handled on a case-by-case basis and must be authorized by one of the following staff: the Corporate Manager of Safety & Health or a Senior Regional Safety & Health Manager. Details of the exemptions are covered in the full SSE Policy.

Clients may define specific SSE requirements for work at their facility or on their project. It is the responsibility of the Project Manager to communicate a client's specific requirements to the appropriate staff within GHD and project subcontractors. Client-specific SSE standards shall be posted on the Safety & Health Portal SSE Folder.

1.5 Project Management And Safety Organization

Project Manager – GHD – Katherine (kathy) Galanti

The GHD Project Manager (PM) is responsible for the overall implementation, review, and approval of the HASP, and for ensuring that all safety and health (S&H) responsibilities are carried out. The PM will also ensure that appropriate resources are provided to support the project.

Site Supervisor – GHD – TBD

The Site Supervisor (SS) is responsible for:

- Ensuring that the HASP is reviewed, approved, and implemented.
- Communicating site requirements to site project personnel and subcontractors through site orientation.
- Consulting with the client/site representative regarding appropriate changes to the HASP.

- Conducting a daily tailgate safety meeting that communicates the site specific hazards. This meeting must be documented on the Tailgate Safety Meeting form in the appendix.
- Ensuring that all necessary cleanup and maintenance of safety equipment is conducted by project personnel.
- Verifying emergency phone numbers and services, including hospital and clinic locations.
- Completing, filing, and correctly submitting the forms attached to the HASP, including daily tailgate meetings, job safety analysis, and daily inspection checklists.
- Implementing risk-based safety procedures on all activities and enforcing safe work practices for project employees
- Observing ill effects on any crew member, especially those symptoms caused by cold/heat stress or chemical exposure.
- Overseeing the safety of visitors who enter the site.
- Maintaining communication with the client/site representative(s) and/or government inspectors/agencies.
- Providing and enforcing the use of safety equipment, personal protective equipment (PPE), and other items necessary for employee or community safety.
- Conducting job site inspections as a part of quality assurance for safety and health.
- Ordering the immediate shutdown of site activities in case of a medical emergency, unsafe condition, or unsafe practice.
- Reporting safety and health concerns to site and/or project management as necessary.

Regional HSE Manager GHD – John Maurer

The Regional HSE Manager is a full time GHD employee who is trained as a safety and health professional and serves in a consulting role to the PM and SS regarding potential safety and health issues. The HSE Manager or trained designee must review, coordinate required changes with PM and provide the final approval of the HASP prior to work beginning on site.

Site personnel

All employees have a role in GHD's HSE program and a responsibility to implement the program. GHD personnel are responsible for:

- Engaging in all aspects of their tasks and jobs when they are prepared to do the job safely, well rested, and mentally prepared for work.
- Utilizing the STAR process before initiating work.
- Implementing Stop Work Authority for any operations that may cause injury, illness, or unsafe conditions to employees, subcontractors, or others.
- Assisting in the development and revision of Job Safety Analysis (JSA) forms that are appropriate to their current scope of work.
- Use, inspect and maintain PPE as required by JSA and site conditions.
- Preparing, submitting and reviewing safety observations using the GHD HSE app or appropriate forms
- Inspecting tools and other equipment before each use or as manufacturer dictates and documenting any defects.
- Correcting job site hazards when possible without endangering life or health.
- Reporting safety and health concerns to the SS, PM, HSE Manager, or SHO (if appointed).

Subcontractors

Subcontractors are responsible for:

- Developing and implementing their own HASP and complying with its contents.
- Attending an initial site orientation and subsequent safety meetings.
- Ensuring that their employees adhere to all site personnel requirements.
- Submitting required documentation to the SS regarding federal, state, or provincial requirements before beginning any work.

- Obtaining approval for the use of GHD's equipment.
- Observing and obeying all GHD/client requirements as well as any specific direction given by GHD's management team.
- Wearing any personal protective equipment required by their HASP and GHD at all times.
- Meeting all governing legislation/regulation/industry standards for equipment used on GHD projects.
- Verifying that all subcontractor employees have required training, medical clearance, and substance abuse testing as required by project.
- Not being in possession or under the influence of alcohol, incapacitating drugs, or medications.

In the event of conflicting safety procedures or requirements, personnel must implement those safety practices that afford the highest level of safety and protection. In addition, noncompliance with safety and health policies and procedures may subject the subcontractor to disciplinary action up to and including termination of their contract with GHD.

Equipment Operators

All equipment operators must meet all the requirements of site personnel listed above and are responsible for the safe operation of heavy equipment. Operators are responsible for conducting documented daily inspections on their equipment to ensure safe performance. Brakes, hydraulic lines, backup alarms, and fire extinguishers must be inspected routinely throughout the project. Equipment will be taken out of service if an unsafe condition occurs. Daily inspections must be provided to the GHD site supervisor prior to the equipment being used.

Authorized Visitors

Authorized visitors, as approved by **Katherine (kathy) Galanti**, are provided with all relevant information regarding site operations and hazards as applicable to the purpose of their visit. Visitors may be required to be accompanied by authorized personnel.

1.6 Site Safety And Health Officer

The site safety and health officer (SHO) is responsible for assisting in the communication of site requirements to site project personnel and subcontractors and for carrying out the health and safety responsibilities include the ones listed under the site supervisor. The SHO has prior experience in working at similar sites. The SHO operates under the supervision of the PM, SS, and HSE Manager.

1.7 Recordkeeping

The SS shall establish and maintain records of all necessary and prudent monitoring activities as described below:

- Name and job classification of the employees involved on specific tasks.
- Air monitoring/sampling results and instrument calibration logs.
- Records of training acknowledgment forms (site specific training, toolbox meetings, etc.).
- Documentation of site inspections, results of inspections, and corrective actions implemented.
- Emergency reports describing any incidents or accidents.

1.8 Site HASP Amendments

Any change to the scope of work must be evaluated for its impact on the overall health and safety of the project and associated personnel. A minor change is one that adjusts already-documented hazards within the HASP and does not expose site personnel to chemicals above exposure limits, such as the introduction of a new JSA, or PPE that does not involve a change in respiratory protection. Amendments must be documented on the Site Health and Safety Plan Amendment Form located in Appendix, in addition to notifications to key personnel.

Significant changes to the scope of work require a rewrite by the PM and review/approval of the HASP by a HSE Manager.

1.9 Training Requirements

All personnel conducting work at this site shall have completed the appropriate safety and health training, as applicable to their job/task duties as it relates to the GHD Tiered Training System. The required training is referenced throughout the HASP and identified on each JSA form

1.10 Site Specific Training

An initial site specific training session or briefing shall be conducted by the PM or SS prior to commencement of work activities. During this initial training session, employees shall be instructed on the following topics:

- Personnel responsibilities
- Content and implementation of the HASP
- Site hazards and controls
- Site specific hazardous procedures (e.g., drilling, excavations, etc.)
- Training requirements
- PPE requirements
- Emergency information, including local emergency response team phone numbers, route to nearest hospital, incident reporting procedures, and emergency response procedures
- Instruction in the completion of required inspections and forms
- Location of safety equipment, such as portable eyewash, first aid kit, fire extinguishers, etc.

The various components of the project HASP will be presented, followed by an opportunity to ask questions to ensure that each attendee understands the HASP. Personnel will not be permitted to enter or work in potentially contaminated areas of the site until they have completed the site specific training session. Personnel successfully completing the training session shall sign the HASP Acknowledgement Form, which is presented as an Appendix.

In addition to the initial site briefing conducted at the commencement of the project, supplemental brief safety meetings shall be conducted by the SS to discuss potential safety and health hazards associated with upcoming tasks and necessary precautions to be taken.

1.11 Safety Meeting/ HASP Review

"Tailgate" safety meetings will take place each day prior to beginning the day's work. All site personnel will attend these safety meetings conducted by the SS. The safety meetings will cover specific safety and health issues, including the appropriate JSAs, site activities, changes in site conditions, and a review of topics covered in the site specific pre-entry briefing. The safety meetings will be documented each day with written sign in sheets containing a list of topics discussed. To assist with the compliance of documentation of the Tailgate safety meetings, there is a Tailgate Safety Meeting form located in the Appendix.

1.12 Fatigue Management

GHD employees and subcontractors are responsible for ensuring they are both physically and mentally fit to perform their job functions safely as part of GHD's Fatigue Management Program. GHD will use the following control measures to minimize fatigue during the project:

- Alter the work schedule to reduce the overall time a worker will perform physically demanding work.
- Monitoring employee behaviors for signs of fatigue.
- Eliminate or reduce where practicable the need to work extended hours, night shifts, or overtime.
- Use work-rest patterns during repetitive tasks to control fatigue and increase mental fitness.

GHD's work/rest balance requirements are referenced based on weight of the vehicle. Less than 10,000 lbs/4536 kg (passenger cars, pickup trucks, SUV) will follow the following guidelines:

- Maximum working time and/or driving and working time within one work day: 14 hours (extendable up to 16 hours if drive time < 4 hours and/or airplane travel is involved; this approach can be taken three times in a 7 day period)
- Maximum continuous drive time: 3 hours followed by a 15 minute break
- Maximum drive time per day: 9 hours (extendable up to 10 hours twice in 7 day period)

Employees that drive vehicles greater than 10,000 lbs/4,536 kg must meet the requirements of the transportation agency for which they work and travel.

Management, as represented by an employee's manager, Project Manager or any Principal, may grant a documented variance to the standard work/rest balance for specific employees for a period covering no longer than one week. Additional variances can be issued after for each week. For further information see Fatigue Management Program on the portal.

1.13 Management Of Change

Safety incidents are known to occur when key changes are not communicated to all stakeholders related to a project. Management of Change is covered by the GHD Quality Manual Section 7.3.7 Control of Project Changes and is documented using QSF-006 Management of Change Form (see Appendix).

The types of changes that are to be documented and communicated are:

- Project management/Resources (key personnel)
- Equipment
- Safety – this would not include daily changes to JSA when dirtied in the field.
- Field Operations/SOP

Form QSF-006 is the tool to document and communicate the change. The completed QSF-006 is to be filed in the GHD field folder of the project file.

1.14 Field Notes

All activities undertaken in the field must be correctly and completely recorded in bound field books, Quality System Field Data Record forms (QSF 200, QSF 400 , and QSF 500 Series D), or in some other GHD approved format (i.e., electronically, loose paper). All records will be kept in the GHD approved format specified for the activities undertaken. The formats have been established to ensure completeness and to provide consistency amongst the field staff regardless of which office they are from. Refer to Section 7 - Control of Monitoring and Measuring Equipment of the GHD Quality System Manual and Section 3.4.1 – Field Notes of the GHD Field Training Manual for more information regarding field note content requirements.

These field notes may be called as evidence in a court of law.

In addition to the formal field notes, field personnel are expected to keep running tables that summarize the field activities so that when questioned at any time during the project, a detailed status of the work completed and that yet to be done can be provided. These lists also serve as checklists to confirm that the correct number and sequence of samples, wells, boreholes, etc. have been collected or completed.

Upon completion of each project, all of the field documentation is brought back and suitably stored at the GHD office in which the field staff who performed the field work are located.

GHD demands that all field note entries are factual and accurate. Everyone recognizes that errors and omissions will be made on occasion. While GHD does not condone a level of effort that is incomplete or inaccurate, it is recognized that it may happen and most of our clients will understand these situations. However, anyone who is caught falsifying any record, no matter how small, will be immediately dismissed.

2. History & Scope

2.1 Site History/Background

The Site is situated on three acres of land at 1130 Niagara Street in Buffalo, New York. Gull Street bisects the Site creating a northern portion (Parcel 3) and southern portion (Parcels 1 and 2). The northern portion of the Site contains an approximately 1,200 square foot storage garage, and an asphalt-covered parking lot. The Southern portion of the Site was formerly occupied by an approximately 45,000 square foot warehouse building, which covered the majority of the property, an asphalt covered loading dock area, and a vegetated area. The warehouse structure was demolished in early 2016. The concrete floor slab remains in place.

The site was purchased in 2015 and is currently owned by Jenesis Development, LLC

Historical information reviewed indicated that the former warehouse building (Parcels 1 and 2) was constructed between 1925 and 1927 and portions of the Site have been in industrial use since prior to 1889. Historical uses include woodworking, machining activities, foundry activities, and vehicle sales and repair. Autocar Sales and Service occupied the structure from the 1930s until the mid 1950s. The rear portion of the structure was used as a bowling alley/restaurant during the 1950s. Namor Products, a manufacturer of chrome plated kitchen sets, purchased the property in the 1950s until selling to Curtis Screw in 1960. Curtis Screw used the facility for manufacturing/metal machining.

On June 2, 2008 a four-alarm fire occurred at the Site. The fire occurred in the original Curtis Screw manufacturing building formerly located on Parcel 2. That portion of the Site complex was separate from the warehouse structure (Parcel 1), but connected through covered walkways. The burned structure was damaged severely enough to require immediate demolition after the fire was extinguished. After demolition, the basement of the building was reportedly backfilled with fill material imported from an off-Site source. According to Leisure Living personnel, the building contained pool chemicals and vinyl pool liners at the time of the fire.

Several environmental investigations have been completed at the Site. The primary Site contaminants are TCE and 1,1,1-TCA on Parcels 1 and 2. Low-levels of SVOCs and metals above criteria are present in soil and groundwater at sporadic locations across the Site including Parcel 3.

2.2 Scope of Work Tasks

The scope of work for this project includes in situ thermal remediation for VOCs on parcels 1 and 2 and grading, installation of slope stabilization materials, capping with clean fill and/or stone as appropriate, and seeding of unpaved areas of Parcel 3.

Activities that GHD will be conducting include:

- Mobilization and demobilization;
- Oversight of the thermal remediation contractor and earthwork contractor (contracted to Jenesis);
- Oversight of post treatment soil boring installation;
- Post treatment soil sampling;
- Oversight of monitoring well installation and abandonment contractor;
- Groundwater sampling;
- Waste characterization sampling; and
- Land surveying.

This HASP covers the specific site activities that will be conducted by GHD personnel and their subcontractors. These activities listed here, and in the attached JSAs cover the tasks being performed onsite.

Driving, Site Reconnaissance and Walk through Activities, Mob/Demob of personnel, material, and equipment, Oversight of Monitoring Well Installation, Monitoring Well Sampling, Collection of Soil Samples, Decontamination of Sampling Equipment and Personnel, Monitoring Well Abandonment, Land Surveying for elevation and location, Soil Boring (Drilling), Site Inspection(Construction), Haz/Non-Haz Waste Sampling (Drums)

If site operations are altered or if additional tasks are assigned, an addendum to this HASP shall be developed to address the specific hazards associated with these changes.

All addendums will be required to be developed in conjunction with project management and a GHD safety professional.

3. Chemical Hazards

3.1 Introduction To Chemical Hazards

This section identifies and evaluates the potential chemical hazards that may be encountered during the completion of this project. These hazards and the anticipated initial exposure levels are based on client data, historical data, etc.

Chemical exposures occur via four major routes of entry: absorption, inhalation, ingestion, and injection. A listing of the chemical contaminants of concern is found in the **Chemical Table** (Table 1) and The **Safety Data Sheets (SDSs)**, for chemical products used on site, are also included in the Appendices. Both the Chemical Table and SDSs include exposure limits, signs and symptoms of exposure, chemical properties, and physical characteristics.

3.2 Control Measures

Before the proper control(s) can be selected, GHD personnel conduct a hazard evaluation of the process, activity, or material. A hazard evaluation may include reviewing information from a chemical container label, SDS, manufacturer, National Institute for Occupational Safety and Health (NIOSH) website, and other resources as needed; identifying route(s) of exposure; and evaluating the process/activity to determine if an exposure evaluation is needed. If necessary, a HSE Manager conducts and documents exposure evaluations.

Exposure to potential on site contaminants/chemicals, such as those listed in Table 1.0 and SDSs, include the following methods:

- Engineering controls such as wetting methods, ventilation, elimination, or substitution.
- Administrative controls such as work rotation, training, or proper hygiene practices (washing facilities).
- Monitoring air concentrations with appropriate equipment in the breathing zone.
- Selecting and using personal protective equipment (PPE) such as gloves or respiratory protection.

JSAs are developed and revised to list the associated hazard controls on a task-specific basis.

3.3 Safety Data Sheets

SDSs are documents created by the chemical manufacturer that describe the substance. Some information found on an SDS includes: hazardous and physical characteristics, handling requirements, storage and disposal information, and signs and symptoms of exposure.

When working with hazardous chemicals, readily available and up-to-date SDSs are required for each chemical. GHD personnel and its subcontractors are responsible for obtaining and maintaining SDSs for their controlled products and for products that they are bringing onto site. All projects maintain an inventory of SDS and are made readily available to all employees and visitors.

3.4 Container Labels

All hazardous materials, hazardous waste, chemical containers, and chemical storage areas are appropriately labeled indicating the chemical identity, hazards present, and any relevant regulatory requirements. Labeling of all chemical containers assists emergency personnel and others in identifying hazards if a spill occurs or emergency situation arises.

Chemical container labeling is the responsibility of the individual who fills and/or uses the chemicals. All containers into which chemicals are transferred are legibly labeled in the language that can be understood by the employees who work with or in proximity (English, French, Spanish, etc.) and include the name of the chemical and appropriate hazard warnings.

3.5 Workers Training

All employees who may work in proximity to controlled products has and maintains current applicable training as appropriate to client, state, provincial or federal requirements, which may include: HAZCOM, WHMIS, TDG, or DOT. Records of training are readily available upon request.

4. Physical Hazards

4.1 Introduction To Physical Hazards

Physical Hazards are factors within the environment that can harm the body without necessarily touching it. Vibration and noise are examples of physical hazards. Physical hazards for this site have been identified in the following section. If the hazards change due to site conditions or additions to the scope of work, a Stop Work must be implemented and the conditions identified to the PM and RHSM.

In addition, personnel must be aware that the protective equipment identified in the JSA may limit dexterity and visibility and may increase the difficulty of performing some tasks.

4.2 Heavy Equipment

The following practices are adhered to by personnel operating heavy equipment (such as backhoes, excavators, bull dozers, rock trucks) and personnel working in the vicinity of heavy equipment.

- Heavy equipment is only operated by authorized, qualified operators.
- All equipment is inspected when equipment is initially mobilized, delivered to a job site, or after it is repaired and returned to service, to ensure that it meets all manufacturer and legislative specifications. Documentation of maintenance records must be available upon request.
- The operator inspects the equipment prior to each use and documents the first use on a daily basis. Documentation of this daily pre operational inspection is available upon request, and, if required, filed with the project files.
- Ensure operator conducts a 360-degree walk around of the equipment prior to entering the equipment
- Seat belts/restraining devices are used on heavy equipment that is not designed for stand up operation.
- Equipment/vehicles that are loaded by crane, excavator, loader, etc. have a cab shield and/or canopy to protect the operator.
- Personnel only ride in equipment that is designed for transporting individuals and have a fully functional seat and available restraining devices. "Piggybacking," such as riding on fender steps or any place outside the cab, is not allowed.
- Personnel are not raised/lowered in buckets.
- Before leaving the equipment controls, the equipment is in its safe resting position or cribbed in a "dead" or neutral position. No controls are abandoned while under load.
- Before raising any booms, buckets, etc., overhead obstructions are checked.
- A competent spotter is used when moving heavy equipment, working within 10 feet of a stationary object, encroaching overhead utilities clearance minimums, in tight quarters, or with limited visibility.
- Employees involved in the operation do not wear any loose fitting clothing, as it can be caught in moving machinery.
- Personnel must wear an approved high-visibility safety vest where any vehicular traffic occurs.
- The work site should be designed to limit the operations being performed in reverse.
- Working areas are properly delineated to keep unauthorized individuals out. Personnel should never proceed into a work zone without making eye contact and receiving authorization from the operator or spotter to cross the path of heavy equipment. Authorization is given from outside the blind or crushing zones of the equipment.

4.3 Drilling Equipment

GHD field staff should minimize time spent in close proximity to an operating drill rig, including during set-up/teardown time. It is critical to maintain a safe work distance from the drill rig crew to allow them the necessary room to perform their tasks. GHD field personnel should only be near the drill rig when their work activity, such as air monitoring, soil sampling, and confirmation of borehole locations, dictates.

Drill staff are responsible for all activities related to drill rig setup and operations. The drilling contractor briefs GHD personnel and crew during the tailgate safety meeting on the rig's critical safety features and identifies known hazards when working near the rig.

The GHD site supervisor ensures the following:

- All PPE and protective hazard mitigation is in place prior to work starting.
- JSAs are reviewed and applied.
- The Daily Pre-Use Inspection checklist is completed by the operator to ensure that the equipment is functioning as intended.
- The emergency switches are functional and verified to be operational during the documented daily equipment check.
- **The QSF-019 Property Access/Utility Clearance Data Sheet is signed and that all utility clearances are obtained, reviewed, understood, and confirmed before drilling activities begin.**
- No rig operators are wearing any loose fitting clothing, including untied shoe/boot laces, drawstrings, etc., due to the potential of being caught in rotating machinery.
- Overhead hazards including utility lines are checked .
- Before the mast of a drill rig is raised, the drill rig is first leveled and stabilized with leveling jacks and/or cribbing, the drill rig is re-leveled if settling occurs after initial setup, the mast is lowered only when the leveling jacks are down, and the leveling jack pads remain deployed until the mast is lowered completely.
- The work area is properly demarcated with rope, caution tape, and fencing, and marked or posted to keep the area clear of pedestrian traffic or spectators.
- Before leaving the controls, the operator shifts the transmission controlling the rotary drive into neutral and places the feed lever in the neutral position.
- Before leaving the vicinity of the drill, the operator shuts down the drill engine.

4.4 Utility Clearances - OSHA

Extreme caution is needed when working around electrical power lines. Electricity flows through metal, wood, and many other conducting materials, including human beings. Elevated equipment such as drill rigs, backhoes, scaffolding, ladders, etc must remain the required distance away according to the local/state/provincial regulations.

These minimum requirements are:

Occupational safety and health act 1926.550(a)(15)

Operating voltage of overhead power

**Operating voltage of
overhead power safe limit of
approach distance for persons
and equipment**

<50 kv

10 feet

>50 kv

20 feet

For lines rated over 50 kv, minimum clearance between the lines and any part of the crane or load shall be 10 feet plus 0.4 inch for each 1 kv, over 50 kv, or twice the length of the line insulator, but never less than 10 feet.

- If any part of a machine may encroach these parameters, SWA is implemented, a review of the SOW is conducted with the PM and RHSM, and a spotter is used.
- If the client has requirements that exceed the above minimums, then the client requirements are used.

Underground Utilities

Underground utilities, if present, are to be clearly marked and identified prior to commencement of work. Follow applicable regulations and client requirements with regards to utility-locating requirements (e.g., One Call).

Personnel involved in intrusive work will:

- Confirm proposed excavation(s) and heavy truck routes are not in the area of subsurface utilities. This meeting is to be documented.
- Review and adhere to GHD's Subsurface Utility Clearance Protocol SOP at a minimum. Use air knifing or vacuum truck digging techniques inside 5 feet of the outside edge of an underground facility.
- Pre-clear holes to 120% of the drill diameter to a minimum depth of 5 feet below ground surface. Consider pre-clearing to greater depths in close proximity to process piping such as loading racks
- Locate boreholes a minimum distances of 5 feet perpendicular from utility mark-out lines
- **Complete the Property Access/Utility Clearance Data Sheet (QSF 019) prior to initiating excavation activities.**
- On private property, request that the owner of the service, locate and mark the service.
- If a service may pose a hazard and cannot be shut off or disconnected, request that the owner of the service supervise the uncovering of the service during the work.
- Identify the work that can be conducted with the assistance of the locator line service, coordinate document/drawing review, and inspect the site for manholes, catch basins, valve boxes, etc. that may indicate the direction/depth of underground installations. Marking indicates only the approximate location of buried lines.

The following are the Uniform Color Codes for utility locates

white proposed excavation

pink temporary survey marking

red electrical power lines, cables, conduit and lighting cables

yellow gas, oil, steam, petroleum or gaseous material

orange communication, alarm or signal lines, cables or conduit

blue potable water

purple reclaimed water, irrigation and slurry lines

green sewers and drain lines

4.5 Railroad

Main Track And Sidings

Machinery and equipment cannot be operated within 25 feet (8.12 meters) of a main track (nearest rail) or siding without Railroad authority and protection. Written authority and Safety Guidelines for Contractors as per specific company can be found in the Appendix. Materials, snow piles, equipment, or other obstructions must not be left where they can affect the ability to see approaching train traffic at public or private railroad crossings. This applies to all manner of equipment, including snow clearing equipment. Contract railroad site representative in advance to arrange protection.

Train Movements and Working Near Tracks

Be alert to train movement. Expect the movement of trains, engines, cars, or other equipment at any time, on any track, and in either direction, even cars on sidings that appear to be stationary, and never climb on, under, or between cars.

- Never rely on others to protect you from train or car movement. Watch for yourself!
- Do not stand on the track in front of an approaching engine, car, or other equipment.
- Be aware of the location of structures or obstructions where clearances are close.
- Never stand or walk on railway tracks, either between the rails or on the ends of ties, unless absolutely necessary. Stay clear of tracks whenever possible. Trains can approach with little or no warning. You may not be able to hear them due to atmospheric conditions, terrain, noisy work equipment, or passing trains in multiple track territory.
- Increased vigilance is required near railway tracks when visibility is poor, such as during fog or blizzard conditions.
- Before undertaking any work on or about railway infrastructure, or that will encroach within 25 feet (8.12 meters) of any railway track prior notification and approval is required.

Protection of Railway Traffic and Work Site

Signs, signals, and flags are necessary for the safe operation of the railway, and shall not be obstructed, removed, relocated, or altered in any way without proper authorization. Blue flag protection on tracks signifies railway employees are on, under, or between rolling equipment. Blue flags are important safety devices and must not be touched or obstructed.

Anyone other than qualified railroad employees, unless specifically authorized by the rail company, you are prohibited from handling track switches, derails, electric locking mechanisms, or other appliances. Personnel operating equipment of any type on the railway tracks must comply with all applicable federal rules and regulations, including but not limited to Canadian Railway Operating Rule (CROR) qualifications.

4.6 Material Handling

Material handling and storage practices are conducted at the project site. Proper lifting reduces the hazard out of moving objects. No one person should handle, lift, or move 50 pounds or more by themselves. Even if the object weighs less than 50 pounds, the configuration or shape of the object should be evaluated to see if two people should be used to lift the object.

Manual Lifting

Consider the following prior to a lift.

- Establish that you can lift the load safely.
- Inspect route to be travelled, confirming sufficient clearance.
- Look for any obstructions or spills.
- Inspect the object to determine how it should be grasped.
- Select and use containers with handles where practical.
- Look for any sharp edges, slivers, or other things that may cause personal injury.
- Do not move any object that will obstruct your field of vision when transporting the load.
- When lifting objects, use proper lifting techniques. Position the body so that the weight of the body is centered over the feet, which provides a more powerful line of thrust and ensures better balance. Start the lift with a thrust of the rear foot. Do not twist.

General Storage Practices

Storage of materials and supplies must not create a hazard. General storage area practices include the following:

- Bags, containers, bundles, etc. stored in tiers must be stacked, blocked, interlocked, and limited in height so that they are stable and secure against sliding or collapse.
- All stacked materials, cargo, etc. must be examined for sharp edges, protrusions, signs of damage, or other factors likely to cause injury to persons handling these objects. Defects are to be corrected as they are detected.
- Storage areas must be kept free from accumulation of materials that constitute hazards from tripping, fire, explosion, or pest haborage.
- Storage areas have provisions to minimize manual lifting and carrying. Aisles and passageways provide for the movement of mechanical lifting and conveyance devices.
- Stored materials do not block or obstruct access to emergency exits, fire extinguishers, alarm boxes, first aid equipment, lights, electrical control panels, or other control boxes.
- Hazardous materials are stored in accordance with the details outlined in the MSDS, or accepted guidelines from reputable agencies. Guidelines include details about the materials reactivity, corrosivity, flammability, etc., as well as appropriate signage.

4.7 Noise

Hearing protection is required for project activities when working in close proximity to machinery, drilling operations, or impact/power tools where noise levels may exceed the decibel range of 85 dBA.

When hearing a coworker at normal conversation distance is difficult or the noise level is approaching or exceeding 85 dBA, hearing protection such as earplugs or muffs must be available/worn by all site personnel and visitors that may be exposed to elevated levels of noise.

Individuals who wear hearing protection are to be adequately trained in the safe use and handling of hearing PPE.

GHD employees who have the potential to be exposed to noise exceeding 85dba in the work environment will be enrolled in the GHD Hearing Conservation Program.

4.8 Electrical Safety

Employees do not accept unnecessary exposure to hazards, such as working on energized electrical installations. When possible, circuits are de - energized according to the GHD Lockout/Tagout program and client requirements to achieve safe working conditions. When it is not possible to de - energize circuits, the Workplace Electrical Safety Program (WESP) requirements ensure that safe conditions and work practices are implemented.

The WESP is the electrical safety program that covers all electrical work performed at GHD facilities and work performed by GHD at client facilities. It also provides mandatory program requirements and is used in conjunction with all other procedures and practices on the site to ensure that electrical work is accomplished safely.

To protect employees from shock and/or arc flash hazards, only individuals who are "qualified" in accordance with the NFPA 70E or CSA Z462 Standards will be allowed to perform Arc Flash Hazards Analysis, LOTO, diagnostic testing, work on live electrical circuits or perform electrical work on equipment. The term "qualified" does not relate to a job title or job assignment, but rather to the activity being performed. Employees who perform electrical work must successfully complete the "Electrical Safety for Qualified Persons" training to be authorized as "qualified". Only persons who have received this training and are knowledgeable in the construction and operation of equipment or a specific work method, and are trained to recognize and avoid the electrical hazards that may be present with respect to that equipment or work practice are allowed to perform this type of work. Consult the GHD Workplace Electrical Safety Program for additional program requirements and permits.

4.9 Control Of Hazardous Energy (Loto)

Hazardous energy sources may be encountered during the servicing and maintenance of machines and equipment, in which the unexpected energization or start-up of the machines or equipment could cause injury to employees.

The minimum performance requirements to control hazardous energy requires that employers develop and implement an energy control program. The elements of an energy control program are as follows:

- Lockout/tagout
- Employee protection
- Energy control procedure
- Protective materials and hardware
- Periodic inspections
- Training and communication
- Energy isolation
- Employee notification

Project personnel who are required to conduct operations and maintenance activities that will require the isolation of an energy hazard through the use of a lockout/tagout device shall follow the GHD program requirements and written procedures for that operation. The program requirements can be located in the Appendix.

Employee Training

Employees authorized to attach and remove lockout/tagout devices shall be provided with initial training regarding the safe application, usage, and removal of such devices. Each authorized employee will receive training in the recognition of applicable hazardous energy sources, the type and magnitude of the associated energy, and the methods necessary for energy isolation and control.

All authorized employees will be provided with refresher training annually, or at more frequent intervals whenever the following conditions apply:

- A job assignment change.
- A change in machinery or equipment, or a process change that presents new hazards.
- A change in the energy control procedures.
- Possible deficiencies in the employee's understanding of the following:
 - ◊ The hazards associated with the energy that controls the machinery or equipment in the employee's work area.
 - ◊ Application and removal procedures for lockout/tagout devices.

Employees who work in areas where lockout/tagout procedures are used shall receive initial and annual refresher training in the purpose and use of lockout/tagout devices and principles behind their use.

4.10 Heat Stress

Heat stress is one of the most common illnesses faced by project personnel when working in elevated temperatures and/or humidity.

Prevention

The following procedures will be carried out to reduce heat stress:

- Heat stress monitoring.
- Acclimatization.
- Sun exposures.
- Work/rest regimes (schedule of breaks) in accordance with Occupational Health Clinics for Ontario Workers (OHCOW).
- Humidex Heat Stress Response Plan – mandatory breaks scheduled in summer months or during high risk activities for heat stress (based on ACGIH)
- Heat stress safety PPE (e.g., cool vests, bandanas)
- Cool potable water available
- Use of buddy system
- Seek shade - Shade is a good source of protection, but keep in mind that shade structures (e.g., trees, umbrellas, canopies) do not offer complete sun protection.

OHCOW Humidex Heat Stress Response Plan		
°F	°C	Response
77-84°F	25-29°C	•supply water to workers on an "as needed" basis
86-91°F	30-33°C	•post "heat stress alert" notice •encourage workers to drink extra water •start recording hourly temperature and relative humidity
93-98°F	34 37°C	•post "heat stress warning" notice •notify workers that they are drinking extra water •ensure workers are trained to recognize symptoms
100-102°F	38 39°C	•provide 15 minutes relief per hour •provide adequate cool (10 15°C) water, at least 1 cup (240 ml) of water every 20 minutes •workers with symptoms should seek medical attention
104-107°F	40 42°C	•provide 30 minutes relief per hour in addition to the provisions listed previously
109-111°F	43 44°C	•if feasible provide 45 minutes relief per hour in addition to the provisions listed above •if a 75% relief period is not feasible then stop work until the humidex is 42°C or less
113°F	45°C or over	•stop work until the humidex is 44°C or less
Note: Humidex plan is a simplified way of protecting workers from heat stress which is based on the 2007 ACGIH heat stress TLV® (threshold limit value®) which uses wet bulb globe temperatures (WBGT) to estimate heat strain. These WBGT's were translated into humidex		

Sun Exposure

Overexposure to sunlight is a common concern when field activities occur during warm weather

conditions. Overexposure can occur on clear, sunny days, as well as on overcast and cloudy days. The following steps should be taken to protect against overexposure to sunlight:

- Always use sunscreen on exposed body parts.
- Cover up.
- Wear safety rated sunglasses.
- Limit time in the midday sun.

4.11 Cold Stress

Cold stress is similar to heat stress in that it is caused by a number of interacting factors including environmental conditions, clothing, and workload, as well as the physical and conditioning characteristics of the individual.

Prevention

A variety of measures can be implemented to prevent or reduce the likelihood of employees developing cold related ailments and disorders.

- Acclimatization.
- Fluid and electrolyte replenishment.
- Eat a well-balanced diet.
- Wear warm clothing.
- Follow work/rest regimes.

The parts of the body most important to keep warm are the feet, hands, head, and face. As much as 40 percent of body heat can be lost when the head is exposed.

TLVs Work/Warm Up Schedule for 4 Hour Shift

THRESHOLD LIMIT VALUES WORK/WARM-UP SCHEDULE FOR FOUR-HOUR SHIFT *											
Air Temperature Sunny Sky		No Noticeable Wind		5 mph Wind		10 mph Wind		15 mph Wind		20 mph Wind	
° C (approx)	° F (approx)	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks
-26° to -28°	-15° to -19°	(Norm breaks) 1		(Norm breaks) 1		75 min.	2	55 min.	3	40 min.	4
-29° to -31°	-20° to -24°	(Norm breaks) 1		75 min.	2	55 min.	3	40 min.	4	30 min.	5
-32° to -34°	-25° to -29°	75 min.	2	55 min.	3	40 min.	4	30 min.	5	Non-emergency work should cease ↓	
-35° to -37°	-30° to -34°	55 min.	3	40 min.	4	30 min.	5	Non-emergency work should cease ↓			
-38° to -39°	-35° to -39°	40 min.	4	30 min.	5	Non-emergency work should cease ↓					
-40° to -42°	-40° to -44°	30 min.	5	Non-emergency work should cease ↓							
-43° to below	-45° & below	Non-emergency work should cease									

*2014 TLVs and BEIs - Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices. Cincinnati: American Conference of Governmental Industrial Hygienists (ACGIH), 2014

4.12 Hand And Power Tools

Hand Tools

- Hand tools must meet the manufacturer's safety standards.
- Hand tools are not to be altered in any way.
- At a minimum, appropriate eye and face protection that meets current applicable standards (ANSI/CSA) must be used.
- Wrenches, including adjustable, pipe, end, and socket wrenches, are not used when jaws are sprung to the point that slippage occurs.
- Impact tools such as drift pins, wedges, and chisels are kept free of mushroom heads.
- Wooden handles are free of splinters or cracks and secured tightly to the tool.
- Any damaged or defective tools are immediately removed from service and tagged for destruction.

Power Tools

- All power tools must be inspected regularly and used in accordance with the manufacturer's instructions and the tool's capabilities.
- Electric tools are not used in areas subject to fire or explosion hazards, unless they are approved for that purpose.
- Corded portable electric tools are connected to a ground fault circuit interrupter (GFCI) when working in wet areas.
- Coiled cords/extension cords are uncoiled when plugged in to allow for dissipation of heat.
- Cords/extension cords rated appropriately for the temperature are used.
- Appropriate eye and face protection that meets current applicable standards (ANSI/CSA) are used.
- Personnel are trained in the proper use of the tool.
- Any damaged or defective power tools must be immediately tagged and removed from service.
- Repairs to hand or power tools are only made by qualified individuals and in accordance with the manufacturer's standards.
- Field or shop modifications to tools or equipment are only made by qualified individuals and in accordance with either manufacturer or engineer-approved specifications.

4.13 Portable Ladders

When portable ladders are in use on work sites, the following guidelines apply as a minimum standard.

- Use the 4 to 1 ratio. The ladder feet are 1 foot away from what it leans against for every 4 feet in height to the point where the ladder rests.
- Never use a ladder in a horizontal position as a runway or a scaffold.
- Never place a ladder in front of a door that opens toward it unless the door is locked, blocked, or guarded by a person.
- Place a portable ladder so that both side rails provide secure footing on soft ground to prevent the ladder from sinking.
- Place the ladder's feet on a substantial and level base, not on a movable object.
- On uneven surfaces, use a block, wedge, or ladder foot.
- Always lash, block, or otherwise secure a ladder's footing on wet or oily pavement, a smooth floor, or an icy or metal surface..
- Do not lean a ladder against unsafe backing, such as loose boxes or barrels.
- Securely lash or otherwise fasten the ladder to prevent it from slipping when using a ladder to access to high places.
- Always extend the ladder at least three rungs (3 feet) above the point of support when gaining access to a roof or elevated platform.
- Always maintain three points of contact when ascending or descending. If material must be handled, place in a bag or bucket and raise or lower it with a rope.
- Always face the ladder when ascending or descending.
- Maintain clean, dry footwear as much as possible to prevent slipping on the rungs.

4.14 Slip, Trip, Hit, Fall

Slip/trip/hit/fall injuries are the most frequent of all injuries to workers. They occur for a wide variety of reasons, but can be minimized by the following prudent practices:

- Spot-check the work area to identify hazards and communicate hazards to on site personnel.
- Update/dirty the JSA to reflect changes.
- Keep work areas clean and free of clutter, especially in storage areas and walkways.
- Secure all loose clothing and ties, and remove jewelry that may pose an entanglement hazard.
- Establish, maintain, and utilize walkways that are free of slip and trip hazards.
- Utilize/install appropriate lighting for walking paths and working areas.
- Beware of slip/trip hazards such as wet floors, slippery floors, and uneven surfaces or terrain.
- Carry only loads you can see over (Refer to Material Handling for additional information).
- Refrain from the use of portable communication devices (cell phones, two-way radios) while traversing the site.
- Keep a safe buffer zone between workers using equipment and tools.

4.15 Aggressive Or Menacing Behavior

When confronted by an individual whose behavior becomes aggressive or menacing, remain as calm as possible. Avoid arguing with or physically confronting the individual. Attempt to distance yourself from the individual. Advise others in the area to leave the scene and request police assistance by having someone call the emergency number listed on the Emergency Contact Sheet. Use the team approach. A staff member who is physically unable to break away from an attacker should shout for help.

The use of physical force is justified when a person believes that such force is necessary to protect himself or herself against the use or imminent use of unlawful physical force by another person.

Should an aggressor only be interested in the taking or damaging of property, do not interfere.

Obtain a description of the individual to provide to local authorities, including height, weight, race, sex, clothing, accent, unusual markings such as tattoos, piercings, scars, hair color, and weapon, if any.

Contact the HSE Help Line and file an incident report with your immediate supervisor as soon as it's safe to do so.

4.16 Adverse Weather Conditions

Adverse weather is the existence of or impending weather conditions such as heavy rain, freezing rain, sleet, snow, high winds (50km/30mph), dust storms, tornadoes, hurricanes, lightning, or any combination of weather that is either not reasonable or not safe for employee exposure. Stop Work Authority (SWA) is executed prior to these conditions as reasonably possible. The site is evacuated according to the emergency plan developed and listed in this Health and Safety Plan.

Based on their expertise and knowledge of manufacturer's recommendations for the equipment being operated, heavy equipment operators such as crane and drill rigs are responsible for advising the site supervisor whether it is safe to continue operations.

The site supervisor decides on the continuation or discontinuation of work based on current and pending weather conditions, the equipment manufacturer recommendations, and the equipment operator's recommendations.

4.17 Flammable & Combustible Liquids

The storage, dispensing, and handling of flammable and combustible liquids must be in accordance with industry standards such as National Fire Protection Agency (NFPA) guidelines. The specific flammable or combustible liquids used at the site may include gasoline, diesel, kerosene, oils, and solvents.

Flammable and combustible liquids are classified according to flash point. This is the temperature at which the liquid gives off sufficient vapors to readily ignite. Flammable liquids have flash points below 100 °F (37.8°C). Combustible liquids have flash points above 100 °F (37.8 °C) and below 200 °F (93.3 °C).

Storage

Many flammables can ignite at temperatures at or below room temperature. They are far more dangerous than combustibles when they are heated. As a result, these products must be handled very carefully. At normal temperatures, these liquids can release vapors that are explosive and hazardous to employee health. Exposure to heat can cause some of these liquids to break down into acids, corrosives, or toxic gases. For this reason, flammable and combustible liquids should be stored in cool, well ventilated areas away from any source of ignition. Always consult the MSDS of the product for specific information.

Flammable and combustible liquids must be stored in designated areas. Such areas must be isolated from equipment and work activity that may produce flames, sparks, heat, or any form of ignition, including smoking. The most practical method is the use of one or more approved (commercially available) flammable/combustible liquid storage cabinets.

Cabinets must be labeled "Flammable – Keep Fire Away." Doors must be kept closed and labeled accordingly. Containers must be kept in the cabinet when not in use.

General Requirements:

- Keep containers of flammable/combustible liquids closed when not in use.
- Keep flammable/combustible liquids in designated areas and approved cabinets.
- Do not allow use of unapproved containers for transfer or storage. Use only approved safety cans (5 gallon maximum) with a spring closing lid and spout cover, designated to safely relieve internal pressure when exposed to heat or fire.
- Use only approved self closing spigots, faucets, and manual pumps when drawing flammable/combustible liquids from larger containers/barrels.
- Use only approved metal waste cans with lids for disposal of shop towels/oily rags.
- Designate "Smoking" and "No Smoking" areas.
- Designate fueling areas.
- Observe all signs indicating "No Smoking," "No Flames," and "No Ignition."

Transferring Flammable/Combustible Liquids

This seemingly routine task can be hazardous if certain precautions are not followed. Grounding and bonding must be observed at all times to prevent the accumulation of static electricity when transferring containers/barrels/drums one to another.

- Drums should be grounded to a grounding rod using a #4 copper conductor.
- Bonding is necessary between conductive containers (e.g., a barrel/drum and a 5 gallon container).

4.18 Volcanos (Alaska)

Volcanic eruptions may be encountered during work in Alaska. Volcanoes Redoubt and Veniaminof are currently active and may erupt with little to no warning. Primary hazards associated with volcanic eruptions are ash fall in the Anchorage area and ash fall and tsunamis on the Kenai Peninsula. Employees who are working at times when these or other volcanoes are displaying signs of activity should check the volcano status every morning prior to field activities on the Alaska Volcano Observatory (AVO) website (www.avo.alaska.edu). Employees should also be familiar with the USGS Ashfall preparedness website (<http://volcanoes.usgs.gov/ash/>) and the AVO Before an Eruption website (<http://volcanoes.usgs.gov/ash/todo.html#household>). If ash fall is observed employees shall report the ash fall by calling (907) 786 7497. The employee should take note of the location, time, light or heavy ash fall, and the current weather when reporting ash fall. Employees should also monitor the NOAA Ashfall Advisory Page (<http://pafc.arh.noaa.gov/volcano.php>) and the ADEC Air Quality Advisories and Alerts (www.dec.state.ak.us/air/am/aq_sr.htm) websites.

4.19 Special Conditions

GHD may be asked to conduct work that requires special precautions/considerations. Potential exposure factors are identified on the left, with associated mandatory conditions identified on the right.

- Remote work locations
 - Working alone is not permitted. Submit a Journey Management Plan. Use call-in procedure to include use of satellite phone if no cell or direct line access.
- Project site is in an area known for high crime or violence activity
 - Working alone is not permitted. A police or security escort is required.
- Entry into abandoned buildings
 - Working alone is not permitted. Use call-in procedure.
- Entry into wooded areas during hunting season
 - Working alone is not permitted. Use a reflective vest. Submit a Journey Management Plan. Use call-in procedure.
- Project work involving single employees (lone worker)
 - Use call-in procedure.

If these situations are possible, please consult with your RSHM to develop a plan prior to your project's start date.

5. Biological Hazards

5.1 Introduction To Biological Hazards

GHD employees conduct numerous project activities where they may encounter biological hazards such as listed in the following table. This section identifies the problems associated with these biological hazards and the precautions to be taken if these hazards are encountered.

The biological hazards identified are applicable to this site. If you are bitten, stung, or attacked by any of the listed hazards, contact the GHD HSE Help Line at 1-866-529-4886

5.2 Wildlife

Tick and Chiggers	•Wear light colored clothing •Keep clothing buttoned or zipped •Keep socks tucked in •Apply repellent containing DEET or Permethrin to clothing and exposed skin •Check hair and clothing periodically using buddy system	•Remove tick with tweezers or fingers and tissue •Grab tick as close as possible to attachment site and pull firmly •Inspect tick to ensure that no parts remain in attachment site •Apply AfterBite containing antiseptic to affected areas •Call GHD HSE Help Line
Flying, Stinging, Biting Insects: Bees, Wasps	•Avoid wearing perfume, hairspray, cologne, and scented deodorant while working outside •If eating outside, keep all food and drinks covered; sweet foods and strong scents attract stinging insects •Never swat or swing at the insect; wait for it to leave, softly blow it away, or gently brush it aside •Inspect areas carefully as bees, wasps, and hornets can nest both in the ground and above ground •If the nests pose a threat, have them professionally removed	•Apply AfterBite containing antiseptic to affected areas or place an ice cube or ice pack over the sting to reduce pain •Remove the stinger with tweezers or scratch with a credit card (catch barbs with card and pull out) •Seek medical attention when the reaction to a sting includes swelling, itching, dizziness, and shortness of breath •Call GHD HSE Help Line
Mosquitoes	•Wear light colored clothing •Keep your body covered as much as possible; wear a hat or mosquito screen •Apply repellent containing DEET or Permethrin to clothing and exposed skin	•Apply AfterBite containing antiseptic to affected areas •If moderate to extreme itchiness is experienced, use over the counter antihistamines
Threatening Dogs	•Stop walking, face the dog, and be relaxed •Keep the dog in your peripheral vision as it circles •If it tries to bite – yell "NO" in a loud stern voice •If you have an item such as a briefcase or field book, keep it between you and the dog •If the dog continues to nip or attacks, fight back; protect your throat and if possible hit the dog in the nose, or kick it in the rib cage, which may stun it and deter it from continuing the attack	•If bitten and the skin is not broken, clean with antiseptic •Notify Supervisor/PM •If skin is broken, clean with antiseptic, cover, and seek medical attention •Notify Supervisor/PM •Call GHD HSE Help Line

5.3 Poisonous Plants

Vegetation Overgrowth	•common weeds and tall grasses •increase in trip hazard, and entanglement •risk of fire during summer season •wear proper PPE, long pants, eye protection •increase in rodent, snake, stinging insect hazards	•discuss clearing area with management to reduce risks •use extra caution when walking due to unseen holes or trip hazards •watch for grass cuts on arms, contact GHD HSE Help Line if reaction occurs

5.4 Biological

Histoplasmosis	Look for evidence of bird or bat colonies. • Before you work in or dig soil that's likely to harbor the fungus that causes histoplasmosis, spray it thoroughly with water. • Wear appropriate PPE for the task. • Clean footwear before leaving the site to prevent spore dissemination in cars, the office, at home, and elsewhere	• Wash hands with soap and warm water after removing your gloves. • If you have persistent flu like symptoms, see your doctor. Tell them if you have been around a bird or bat colony. • Call GHD HSE Help Line
Hantavirus	• Inspect work area for rodent droppings • For low amounts of droppings, use Level C with N95 disposable respiratory protection • For heavy accumulation, use Level C Full Face PAPR with P100 cartridge or, in severe cases, Level B • Soak dead mice, nests, and droppings thoroughly with a 1:10 solution of sodium hypochlorite (household bleach); bleach kills the virus and reduces the chance of further transmission • Place contaminated material in a plastic bag and seal for disposal • Disinfect all equipment	• Wash gloved hands with soap and water or spray a disinfectant or bleach solution on gloves before taking them off. • Wash hands with soap and warm water after removing your gloves. • If you have been around rodents and have symptoms of fever, deep muscle aches, and severe shortness of breath, see your doctor immediately • Call GHD HSE Help Line
Blood-borne Pathogens	• Exposure comes through work activities such as landfill, sewage treatment, sewers, contaminated medical waste • Virus, Bacteria, Fungus, and Parasites are considered blood-borne • Proper hygiene is extremely important to prevent ingestion • Wear proper PPE in known areas (gloves, long sleeves, long pants, safety glasses)	• All human blood and human body fluids treated as infectious • Cover all nicks and cuts to prevent cross-contamination. • Disinfect hands with sanitizer • Proper hygiene extremely important to prevent ingestion and eye contact • More information review GHD blood-borne policy • Call GHD HSE Help Line if exposed.
Psitticosis - Bird Droppings	• Breathing in the organism when the urine, respiratory secretion, or dried feces • Other sources of exposure include mouth-to-beak contact, a bite from an infected bird. • Bacteria starts an infection that varies in severity from a mild flu-like illness to severe pneumonia • PPE may include gloves, protective clothing, boots, and where appropriate, a respirator	• Adequate ventilation systems including the use of high efficiency particulate air (HEPA) filters to reduce the spread of contaminated air. • Disinfectants area with ammonium compounds, isopropyl alcohol, 70% ethanol, household bleach (diluted to 1%) • Wetting the wastes before removal decreases aerosolization • Call GHD HSE Help Line if exposed

Legionella	•Minimize water misting, stagnant water, and dead zones •Manage water temperature •Implement a preventative maintenance and inspection program to monitor equipment •Conduct Legionella testing of water systems and equipment	•If you are suffering a respiratory ailment, notify your supervisor and contact the GHD HSE Help Line

6. Personal Protective Equipment

6.1 Introduction To PPE

Controlling a hazard at the source is the best way to protect employees. When engineering, work practice, and administrative controls are not able to protect our employees, GHD provides personal protective equipment (PPE) to its employees and ensures that the PPE is used appropriately. PPE is equipment worn as a barrier to minimize exposure to a variety of hazards.

This section covers applicable PPE requirements, which include eye, face, hand, head, foot, and respiratory protection.

6.2 Types of Personal Protective Equipment (PPE)

The type of PPE required for work varies based on the task being performed. The specific PPE required for each individual task is documented in the appropriate task-specific JSA. The recommended minimum PPE for GHD site work is as follows:

- Shirts with a minimum 6-inch sleeve.
- Long pants made from suitable sturdy material .
- Grade 1 protective footwear meeting CSA Z195 M92 (Canada)/ ANSI Z41.1 (US), green patched (triangle), steel-toed/puncture-resistant and electric shock-resistant sole with a 6-inch cuff, fully laced and secured, in material appropriate for weather and task.
- Safety glasses or goggles (based on the type of hazard – dust, splash, etc.), meeting CSA Z94.3 (Canada) or ANSI Z87.1 (US) standards.
- Hand protection such as gloves meeting standards EN 388 and ANSI 105-2000 as appropriate for the task as per JSA, with selection based on the hazards (abrasion, blade cut, tearing, puncture, and impact) associated with the task being performed.
- Reflective garment meeting CSA Z96 02 or ANSI 107 (as required).
- Type 1 Class E hardhat, meeting either CSA Z94.1 05, Z94.1 92, ANSI Z89.1, or Z89.1.
- Hearing protection meeting CSA/ANSI approved NRR of at least 20 dBA if noise levels exceed 85 dBA.

Additional minimum requirements for PPE include:

- All PPE are maintained in good condition with no rips, tears, or damage that compromise integrity.
- PPE is not loose fitting as to avoid entanglement issues.
- All PPE is disposed of and/or decontaminated at the conclusion of each workday. The most contaminated PPE is decontaminated first.
- All disposable equipment is removed before meal breaks and at the conclusion of the workday, and replaced with new equipment prior to commencing work.
- Reusable equipment (safety glasses, hard hats, goggles, etc.) is cleaned and sanitized according to GHD and/or manufacturer guidelines.
- Eating, drinking, chewing gum or tobacco, and smoking are prohibited while working in areas where the potential for chemical and/or explosive hazards may be present. Personnel must wash thoroughly before initiating any of the aforementioned activities.

6.3 Types Of Protective Material

No universal protective material exists. All materials will decompose, be permeated, or otherwise fail to protect under certain circumstances. Protective clothing can be constructed from a variety of materials for protection against exposure to specific physical, chemical, or biological hazards.

Fortunately, most manufacturers list guidelines for the use of their products. These guidelines usually concern gloves or coveralls and generally only measure rate of degradation, which is failure to maintain structure. A protective material may not necessarily degrade, but may allow a particular chemical to permeate its surface. For this reason, guidelines must be used with caution. When permeation tables are available, they are used in conjunction with degradation tables.

To obtain optimum usage from PPE, the following procedures are followed by all site personnel using PPE:

- When using disposable coveralls, don a clean, new garment after each rest break or at the beginning of each shift
- Inspect all clothing, gloves, and boots both prior to and during use for:
 - ◊ Imperfect seams
 - ◊ Non uniform coatings
 - ◊ Tears
 - ◊ Poorly functioning closures
- Inspect reusable garments, boots, and gloves both prior to and during use for:
 - ◊ Visible signs of chemical permeation
 - ◊ Swelling
 - ◊ Discoloration
 - ◊ Stiffness
 - ◊ Brittleness
 - ◊ Cracks
 - ◊ Any sign of puncture
 - ◊ Any sign of abrasion

Reusable gloves, boots, or coveralls exhibiting any of the characteristics listed above are discarded. PPE used in areas known or suspected to exhibit elevated concentrations of chemicals are not reused.

6.4 Respiratory Protection

Respiratory protection is sometimes required for personnel during project activities when action levels exceed the occupational exposure levels. When respirators are required, personnel identify and select the appropriate air purifying respirator and supporting cartridge medium, and follow the procedures and guidelines in their respective written Respiratory Protection program.

At a minimum, all personnel required to use this equipment are:

- Instructed in how to properly fit a respirator to achieve the required face piece to face seal for respiratory protective purposes.
- Medically cleared for the use of respiratory protection.
- Appropriately fitted for the selected respirator through established recognized fit testing methods (quantitative/qualitative), and documentation of fit is readily available.
- Free of beards, sideburns, eyeglasses, and upper or lower dentures that could affect the face seal.

Further regulations for the use of respiratory protection include:

- Cartridges are changed prior to breakthrough, daily, or when personnel begin to experience increased inhalation resistance or breakthrough of a chemical warning property.
- Respiratory equipment and other non disposable equipment are fully decontaminated.
- Appropriate action levels are established and documented based on the applicable occupational exposure limits.

NOTE: This HASP is not intended for the use of supplied air operations. For supplied air operations, the project manager and a GHD safety professional conduct a review of the scope of work.

GHD identifies the type of respirator and cartridge and documents on the applicable JSA for the affected tasks and on Table 2.

6.5 Respirator Cleaning

Respirator decontamination is conducted once daily at a minimum. Face pieces are disassembled, the cartridges are thrown away, and all other parts are placed in a cleansing solution. After an appropriate amount of time in the solution, the parts are removed and re seated with tap water.

Face pieces are allowed to air dry before being placed in sanitized bags and stored in a clean area.

6.6 Levels Of Protection

Protection levels provided by PPE selection are upgraded or downgraded based upon a change in site conditions or the review of the results of air monitoring or the initial exposure assessment monitoring program, if one was conducted.

When a significant change occurs, the hazards are reassessed. Some indicators of the need for reassessment are:

- Commencement of a new work phase.
- Change in job tasks during a work phase.
- Change of season/weather.
- Temperature extremes or individual medical considerations limiting the effectiveness of PPE.
- Chemicals other than those expected to be encountered are identified.
- Change in ambient levels of chemicals.
- Change in work scope that affects the degree of contact with areas of potentially elevated chemical presence MUST be re-evaluated.

All proposed changes to protection levels and PPE requirements are reviewed and approved prior to implementation by the SS.

7. Air Monitoring

7.1 Introduction To Air Monitoring

Inhalation hazards are caused from the intake of vapors and contaminated dust. Air monitoring shall be performed while intrusive activities are taking place to detect the presence and relative level of those air contaminants that are inhalation hazards. The purpose of air monitoring is to identify and quantify airborne contaminants in order to determine the level of worker protection needed. Initial screening for identification is often qualitative, but the determination of its concentration (quantification) must await subsequent testing.

All instruments will be calibrated on a daily basis in accordance with the manufacturer's guidelines. Records of all calibrations and real time measurements will be kept in a bound field logbook or documented via air monitoring and calibration log sheets.

Correction factors have been determined by the air monitoring equipment manufacturers that enable the user to quantify a large number of chemicals using only a single calibration gas, typically isobutylene for PIDs and methane for LEL. Applicable Correction Factors (CF) for either LEL or PIDs must be applied for known chemicals of concern. These CFs and how to apply them can be found in the air monitoring instrument operating manual or online from the manufacturers website under "Technical Notes".

When air monitoring is required, the workers breathing zone(s) will be monitored and the results recorded. Additionally, when necessary, area samples at the following locations will be taken daily. Record time, location, and results of monitoring and actions taken based on the readings:

- Upwind of work areas to establish background concentrations.
- In support zone to check for contamination or migration of emissions.
- Downwind of work area to track any contaminants/emissions leaving the site.

The data collected throughout the monitoring effort shall be used to determine the appropriate levels of protection. **Action levels for upgrading or downgrading of PPE have been established on Table 2 and must be reviewed by your HSE Manager/Safety Professional**

7.2 Types Of Devices

Air monitoring equipment to be used during site activities shall consist of:

PHOTOIONIZATION DETECTOR (PID)

Exposure to volatile organic compounds (VOCs) shall be monitored with a photoionization detector (PID) with required eV lamp as per Table 1. The PID has the ability to detect organic vapor concentrations from 1 part per million (ppm) to 2,000 ppm. All PID monitoring shall be conducted in the breathing zone.

7.3 Monitoring Frequency

Monitoring will be conducted continuously during ground intrusive activities or during any activity where airborne hazards (e.g., organic vapors) may be present. The monitoring equipment listed in this HASP for the work activity, relates to the initial levels of protection listed on the TABLE 2. If the results of the first hour of monitoring indicates contaminant concentrations are non detect, and no differing site conditions are observed, then the monitoring frequency may be decreased.

Monitoring results will be legibly documented each work day. They will note project name/number, date, time, serial number, date of last calibration, and the name of person performing calibration, name of person performing monitoring, monitor location within the site, and monitoring results. Daily documentation will be kept with the SS and included in the project file.

7.4 Safety And Health Action Levels

An action level is a point at which increased protection or cessation of activities is required due to the concentration of contaminants in the work area. All activities shall be initiated as per JSA requirements. The appropriate actions are to be taken at designated action levels. The initial action level(s) for site work can be located in **Table 2**.

In addition to the action level, an upgrade to Level C is required if:

- Any symptoms occur, as described on the Table 1 Signs and Symptoms
- Requested by an individual performing the task
- Any irritation to eye, nose, throat, or skin occurs

A work stoppage and evacuation (cease and desist) at the specific work area is required if levels in the breathing zone exceed the protection factor of the respirator.

8. Site Control

8.1 Introduction To Site Control

The purpose of site control is to minimize potential contamination of workers and protect the public from hazards found on site. Site control also includes site security for the protection of GHD employee and subcontractor when working in public areas. Site Control is especially important in emergency situations.

Site control, work area demarcation, and site security will be achieved through posting of signage and placement of barricades and or personnel. All controlled areas will have the appropriate signage posted. Barricades and warning signs will be placed to warn personnel of potential hazards. A standby person (spotter) may be utilized in place of barricades, where appropriate. The following materials may be used to barricade the work area and protect both public and GHD:

- Temporary Fence
- High Visibility Tape, Rope or Chain
- Flagging
- Warning Signs
- Traffic Cones

Approved pedestrian and vehicle traffic paths will be determined during Tailgate Safety Meetings based upon current site conditions and work locations. When applicable, one pathway should be established for heavy equipment and one for personnel decontamination.

The majority of site operations, as well as access to the site, could be controlled from the support zone. The support zone will provide for team communications, emergency response, and sanitary facilities. Appropriate safety and support equipment also will be located in this zone.

The support zone will be located upwind of site operations if possible, and would be used as a potential evacuation point if appropriate. No potentially contaminated personnel or materials are allowed in this zone.

8.2 Work Zone Demarcation

When performing work that could put yourself or others at risk, you must demarcate an Exclusion Zone around your work. This is typically done with yellow and black plastic "barricade tape." Use signs, placards, and other postings as necessary to warn others not to enter the demarcated area unless they have business in the area and have authorization to enter. Where appropriate, post special requirements for entry.

The levels and requirements for work zone demarcation is based on the task being performed or the requirements of the client.

8.3 Work Zone Demarcation Level 1

Task such as:

- Monitoring Well Sampling
- Inspection of Equipment
- Tasks that Distract Attention from Vehicle Traffic

These task require the use traffic cones, high visibility tape or temporary barricades such as sawhorses.

8.4 Two-Person Crew/Buddy System

A Two-Person Crew or Buddy System shall be implemented to protect the employees and public when conducting high risk activities such as:

- Working near traffic
- Working ON or NEAR water
- Excessive noise to which hearing traffic or communication is difficult
- Confined or restricted spaces
- In an isolated area such as landfills or wooded areas
- Areas with high crime rates

When using the buddy system, visual contact must be maintained between crew members at all times, and crew members must observe each other for signs of chemical exposure, heat, or cold stress. Indications of adverse effects include, but are not limited to:

- Changes in complexion and skin coloration
- Changes in coordination
- Excessive salivation and pupillary response
- Changes in speech pattern.

Project personnel must also be aware of potential exposure to possible safety hazards, unsafe acts, or noncompliance with safety procedures. Individuals must inform their partners or fellow team members of non visible effects of exposure to toxic materials. The symptoms of such exposure may include:

- Headaches
- Dizziness
- Nausea
- Blurred vision
- Cramps
- Irritation of eyes, skin, or respiratory tract.

If protective equipment or noise levels impair communications, prearranged hand signals must be used for communication. Personnel must stay within line of sight of another team member.

8.5 Communication

Each member of the project team will be able to communicate with other team members at all times. Communications will be by way of:

- Cell Phones/Smart Phones

The primary means for external communication are telephones and radio. If telephone lines are not installed at a site, all team members should:

- Know the location of the nearest telephone
- Have the necessary telephone numbers readily available

Note: The authorized use of cellular phones must be cleared by the client prior to entering site.

The following procedures will be followed by all site workers when using a cell phone on site:

- No cell phone use while driving or operating equipment.
- No cell phone use while in the Exclusion Zone.
- If using a cell phone on site, find a location where you can safely use the phone. Do not walk around the site while using a cell phone.

Understanding of the following standard hand signals will be mandatory for all employees, regardless of other means of communication:

- Hand gripping throat — Cannot breathe
- Hands on top of head — Need assistance
- Thumbs up — OK, I'm alright, I understand
- Thumbs down — No, negative
- Gripping partner's wrist, or gripping both of your own hands on wrist (if partner is out of reach) – Leave area immediately

8.6 Decontamination And Hygiene

Decontamination

In general, everything that enters the site must either be decontaminated or properly discarded upon exit from the site. Prior to demobilization, potentially contaminated equipment will be decontaminated on a wash pad (decontamination pad), drum, or containment pad which then will be placed into appropriate container and labeled as hazardous waste and will be stored in a designated area until disposal arrangements are made.

The type of decontamination solution to be used is dependent on the type of chemical hazards.

The decontamination solution for heavy equipment and for any reusable PPE is Alconox/Liqui nox soap. The MSDSs for Alconox/Liquinox will be located in the Appendix.

Personnel Decontamination Procedures

Personnel decontamination will be completed in accordance with the GHD Safety and Health Program for personnel decontamination. Wash water and sediments will be collected and stored with any runoff water collected for subsequent treatment/disposal. PPE, trash, etc. will be sent off-Site for disposal. It will be kept separate from trash generated in clean areas of the Site.

All disposable equipment shall be doffed before meal breaks and at the conclusion of the workday and replaced with new equipment prior to commencing work.

Procedures for decontamination must be followed to prevent the spread of contamination and to eliminate the potential for chemical exposure.

Personnel - Decontamination will take place prior to exiting the contaminated work area.

Decontamination procedures are as follows:

Step 1 Remove all visible contamination and loose debris by washing with clean water.

Step 2 Remove all outer clothing that came in contact with the contamination (i.e., boot covers and outer gloves) and either dispose of in disposable container or wash in detergent solution and rinse.

Step 3 Remove protective clothing; dispose of in disposable container.

Step 4 Remove respirator, sanitize prior to reuse.

Step 5 Remove inner gloves, dispose of in disposable container.

Step 6 Wash and rinse hands.

General Safety and Personnel Hygiene

1. Eating at the site is prohibited, except in specifically designated areas. Designation of eating areas will be identified to each employee. The location of these areas may change over the duration of the project to maintain adequate separation from the active work area(s).
2. Smoking at the site is prohibited.
3. Individuals getting wet to the skin with effluent from the washing operation must wash the affected area immediately. If clothes in contact with skin are wet, then these must be changed.
4. Hands, face, neck, and other exposed areas must be washed with soap and water before eating, drinking, smoking, before using toilets, and before leaving the site.
5. All disposable coveralls and soiled gloves will be placed in covered containers at the end of every shift or sooner, if deemed necessary by the SHO. Wastes will be stored until proper disposal arrangements have been made.
6. Personnel working on site will not be permitted to wear facial hair that interferes with the mask to face seal on air purifying respirators.
7. All personnel performing or supervising work within the EZ must wear appropriate PPE, observe, and adhere to the personal hygiene related provisions of this section.
8. Personnel found to be disregarding the personal hygiene related provisions of this HASP will, at the discretion of the SHO, be barred from the site.

8.7 Social Protection

Security Measures

A site assessment should be made prior to performing work in high risk areas for violent crime. Additionally, it may be important to gather as much information as possible from the client, describing the location and social conditions of the area where work will be performed.

In the event it has been determined that this work will occur in an area of high risk, consideration shall be given to providing on site security for the protection of the employee. This option may

include services from a security agency, local law enforcement (if available), or the services of an off duty law enforcement officer. The Project Manager and/or Project Coordinator shall be contacted and provide authorization prior to making these arrangements.

Anti-social behavior means different things to different people – noisy neighbors who ruin the lives of those around them, 'crack houses' run by drug dealers, loitering by drunkards, people begging by cash points, abandoned cars, litter and graffiti, young people using airguns to threaten and intimidate or people using fireworks as weapons.

When in this situation, there is no single strategy that always works. Remember these tips when faced with work conditions in volatile neighborhoods:

Street Precautions

When walking to and from your vehicle, or in and around the work site:

- Be alert to your surroundings and the people around you, especially if you are alone or it is dark
- Whenever possible, travel with a colleague
- Stay in well lighted areas as much as possible
- Walk close to the curb; avoid doorways, bushes, and alleys where someone could hide
- Walk confidently, and at a steady pace; make eye contact with people when walking
- Do not respond to conversation from strangers on the street, continue walking

Harm Reduction

Do as much as you can to avoid a confrontation "anticipation and avoidance" are the key words.

- If you get caught up in a situation, try to talk to an aggressor without provoking them.
- Practice relaxation, as appearing fearful or stressed can actually provoke an attack.
- Remember that body language is important in aggressive situations, so maintain a comfortable distance between you and the aggressor.
- It may be more advisable to submit than to resist and risk severe injury or death. You will have to make this decision based on the circumstances. Be especially careful, if your attacker has a weapon.
- Avoid arguing with or physically confronting the individual. Attempt to distance yourself from the individual. Advise others in the area to leave the scene and request police assistance by having someone call the emergency number listed on the Emergency Contact Sheet. Use the team approach. A staff member who is physically unable to break away from an attacker should shout for help.
- Steady yourself if danger threatens. Panic can disable you, so again it's useful to learn how to keep control in a difficult situation.
- If you must fight back, adopt what police term the "bash and dash" approach. Primary targets are the eyes, nose, mouth, ears, throat, groin, knees, or shins; choose whichever is easiest to get to.
- Be aware that your attacker might be stronger than you, or may take what you are using in self defense and use it against you. It is often better just to shout loudly and run away.
- When confronted by an individual whose behavior becomes aggressive or menacing, remain as calm as possible. Avoid arguing with or physically confronting the individual. Attempt to distance yourself from the individual. Advise others in the area to leave the scene and request police assistance by having someone call the emergency number listed on the Emergency Contact Sheet. Use the team approach. If you are physically unable to break away from an attacker, shout for help.
- The use of physical force is justified when a person believes that such force is necessary to protect him or herself against the use or imminent use of unlawful physical force by another person. The use of physical force is also justified in the defense of another party, such as a co worker, who is being subjected to unlawful physical force. You can use any technique of legal self defense in order to halt or distract an attacker until law officers arrive on the scene.
- Should an aggressor only be interested in taking or damaging property, do not interfere. Obtain a

description of the individual to provide to local authorities, including height, weight, race, sex, clothing, accent, unusual markings such as tattoos, facial piercing, scars, hair color, and weapon, if any.

- Shout 'fire' rather than 'help' – it can get more results.
- Stay alert and observant so that you can better describe your attacker and the assault to the police.
- Report the incident to the GHD Help Line and BWISE and work with your PM and HSE Manager to complete the investigation

Drug Activity

The safe retrieval and disposal of used hypodermic needles and syringes:

- GHD employees must not handle or remove any hypodermic needles or syringes. You should contact the local Police Department, Fire Department, or Health Department for removal from the job site.
- If you are injured by a discarded needle you can receive a vaccination against Hepatitis B within 48 hours of the incident. Notify the GHD Help Line and seek medical attention, call 911 if necessary.
- If an accident occurs where a needle or other sharp object has punctured the skin, then the injured person should:
 - ◊ Encourage the wound to bleed gently
 - ◊ Wash well with soap under cold running water
 - ◊ Cover the wound with a waterproof dressing
 - ◊ Seek medical attention as soon as possible
 - ◊ Inform the SS and/or PM
 - ◊ Complete a GHD Incident Reporting Form

Car Jacking

You can help prevent yourself being a victim of car jacking by:

- Keeping your doors locked in built up areas, and trying to keep the windows wound up, especially at traffic lights
- Being aware of what people are doing around you
- Using the middle lane, if there is one, when waiting at junctions or lights, so that your car is harder to get to from the pavement
- Not stopping to help someone who has broken down (if you really want to help, pull over at the next garage or police station and call for help)
- Driving to the next garage or police station and reporting them if someone tries to pull you over for no reason

A car jacker may 'accidentally' bump into your car, aiming to get you out of the car so they can steal it. If this happens, you may choose not to get out of the car – especially if you do not think it is a genuine accident. Wind the window down a little bit to talk to them if you want to.

Aggressive or Menacing Behavior

Report to the GHD HSE Help Line, BWISE and work with your PM and HSE Manager to complete the investigation.

8.8 Site Security

Site security is necessary to prevent the exposure of unauthorized, unprotected people to site hazards and to avoid interference with safe working procedures. Security shall be maintained outside of the actual work area(s) so as to prevent unauthorized entry into the work area(s). Members of the general public are to be protected from site hazards.

8.9 HAZWOPER Addendum

General Safety Practices

Duration of Work Tasks

The duration of activities involving the usage of PPE will be established by the SS or SHO based upon ambient temperature and weather conditions, the capacity of personnel to work in the designated level of PPE and limitations of the protective equipment (i.e., ensemble permeation rates, life expectancy of the APR cartridges, etc.) As a minimum, rest breaks will be observed at the following intervals:

- i) 15 minutes midway between shift start-up and lunch
- ii) One-half to one hour for lunch
- iii) 15 minutes in the afternoon, between lunch and shift end

All rest breaks will be taken in the clean area (Support Zone [SZ]) after full decontamination and PPE removal. Additional rest breaks will be observed based upon the heat stress monitoring guidelines presented in Section 4.2.

Site Control

Authorization to Enter

All personnel working in Exclusion Zones (EZs) must have completed hazardous waste operations initial training as defined under OSHA Regulation 29 CFR 1926.65; have completed their training or refresher training within the past 12 months, and have been certified by a physician as fit for hazardous waste operations in order to enter a site area designated as an EZ or Contaminant Reduction Zone (CRZ).

Personnel without such training or medical certification may enter the designated Support Zone (SZ) only. The SS or SHO will maintain a list of authorized persons; only personnel on the authorized list will be allowed within the EZ or CRZ.

Site Orientation and Hazard Briefing

No person will be allowed in the general work area during project operations without first being given a Site orientation and hazard briefing. This orientation will be presented by the SS or SHO, and will consist of a review of this HASP. This review must cover the chemical, physical, and biological hazards, protective equipment, safe work procedures, and emergency procedures for the project. A Training Acknowledgement Form is provided in Appendix A for documentation purposes. In addition to this meeting, Daily Safety Meetings will be held each day before work begins. All individuals on the Site, including visitors, must document their attendance to the initial briefing as well attending the Daily Safety Meetings. Appendix A also presents the forms that will be used for documenting the Daily Safety Meeting.

Certification Documents

The PM, SS and SHO are responsible for ensuring that all personnel working at the Site meet the training and medical surveillance requirements. Subcontractor personnel must provide their

training and medical documentation to the SHO prior to the start of fieldwork.

Entry Requirements

In addition to the authorization, hazard briefing and certification requirements listed above, no person will be allowed to enter the Site unless he or she is wearing the minimum support zone PPE as described in Section 4.0. Personnel entering the EZ or CRZ must wear the required PPE for those locations.

Emergency Entry and Exit

Individuals who must enter the Site on an emergency basis will be briefed of the hazards by the SS or SHO. All hazardous activities will cease in the event of an emergency and any sources of emissions will be controlled, if possible.

People exiting the Site because of an emergency will gather in a safe area for a head count. The SS or SHO is responsible for ensuring that all people who entered the work area have exited in the event of an emergency.

Contamination Control Zones

Contamination control zones are maintained to prevent the spread of contamination and to prevent unauthorized people from entering hazardous areas.

Exclusion Zone (EZ)

The EZ consists of the specific work area, or may be the entire area of suspected contamination. All personnel entering the EZ must use the required PPE, and must have the appropriate training and medical clearance for hazardous waste work. The EZ is the defined area where there is a possible respiratory and/or contact health hazard. Cones, caution tape, or other appropriate means will identify the location of each EZ.

Contamination Reduction Zone (CRZ)

The CRZ or transition area will be established, if necessary, to perform decontamination of personnel and equipment. All personnel entering or leaving the EZ will pass through this area to prevent any cross- contamination. Tools, equipment, and machinery will be decontaminated in a specific location. The decontamination of all personnel will be performed on-Site adjacent to the EZ. Personal protective outer garments and respiratory protection will be removed in the CRZ and prepared for cleaning or disposal.

This zone is the only appropriate corridor between the EZ and the SZ.

Support Zone (SZ)

The SZ is a clean area outside the CRZ located to prevent personnel from exposure to hazardous substances. Eating and drinking will be permitted in the support area only after proper decontamination. Smoking may be permitted in the SZ, subject to Site requirements.

Buddy System

All project personnel must use the buddy system. Visual contact must be maintained between crew members at all times, and crew members must observe each other for signs of chemical

exposure, heat, or cold stress. Indications of adverse effects include, but are not limited to:

- i) Changes in complexion and skin coloration
- ii) Changes in coordination
- iii) Excessive salivation and pupillary response
- iv) Changes in speech pattern.

Project personnel must also be aware of potential exposure to possible safety hazards, unsafe acts, or noncompliance with safety procedures. Individuals must inform their partners or fellow team members of non-visible effects of exposure to toxic materials. The symptoms of such exposure may include:

- i) Headaches
- ii) Dizziness
- iii) Nausea
- iv) Blurred vision
- v) Cramps
- vi) Irritation of eyes, skin, or respiratory tract.

If protective equipment or noise levels impair communications, prearranged hand signals must be used for communication. Personnel must stay within line of sight of another team member.

Site Monitoring

Air Monitoring

Personal Air Monitoring Program

The PM, SS and SHO shall also implement a personnel air-monitoring program for those project personnel who have the highest risk of potential for exposure to chemicals present on Site. This monitoring will be done in compliance with 1926.65(h). Samples will be collected during startup of those project activities where personnel face potential exposure. The PM, SS and/or SHO will determine the number and frequency of sampling events. Appropriate NIOSH methodology will be followed and all samples are to be sent to an American Industrial Hygiene Association (AIHA) accredited laboratory.

Results for all personnel air sampling will be posted for all project personnel to review.

Personnel Training

General

Required project personnel as discussed in Section 1.0 must have completed hazardous waste operations-related training, as required by the OSHA Standard 29 CFR 1926.65. Field personnel also receive a minimum of 3 days of actual field experience under the direct supervision of a trained,

experienced supervisor. Personnel who completed their training more than 12 months prior to the start of the project must have, if required, completed an 8-hour refresher course within the past 12 months. The SS must also have completed an additional 8 hours of training that is required by OSHA for supervisors.

Basic 40-Hour Course

The following is a list of the topics typically covered in a 40-hour training course:

- i) General safety procedures
- ii) Physical hazards (fall protection, noise, and heat stress, cold stress)
- iii) Names and job descriptions of key personnel responsible for Site health and safety
- iv) Safety, health, and other hazards typically present at hazardous waste sites
- v) Use, application, and limitations of PPE
- vi) Work practices by which individuals can minimize risks from hazards
- vii) Safe use of engineering controls and equipment on site
- viii) Medical surveillance requirements
- ix) Recognition of symptoms and signs, which might indicate overexposure to hazards
- x) Worker right-to-know (Hazard Communication OSHA 1926.59/1910.1200)
- xi) Routes of exposure to contaminants
- xii) Engineering controls and safe work practices
- xiii) Components of a Site HASP
- xiv) Decontamination practices for personnel and equipment
- xv) Confined space entry procedures
- xvi) General emergency response procedures

Supervisor Course

Management and supervisors receive an additional 8 hours of training which typically includes:

- i) General Site safety and health procedures
- ii) Emergency procedures
- iii) PPE programs
- iv) Air monitoring techniques

Medical Surveillance Program

Medical Examination

All required personnel who will enter a Site EZ or CRZ must have successfully completed a pre-placement and/or annual physical examination prior to entering one of these work zones. This medical surveillance program must comply with OSHA 29 CFR 1926.65(f).

Pre-Placement Medical Examination

All on-Site project personnel who will enter an EZ or CRZ must have completed a comprehensive medical examination within the past 12 months that meets the requirements of applicable OSHA Regulations. The annual medical examination typically includes the following elements:

- i) Medical and occupational history questionnaire
- ii) Physical examination
- iii) Complete blood count, with differential
- iv) Liver enzyme profile
- v) Chest X-ray, once every 3 years, for non-asbestos workers
- vi) Pulmonary function test
- vii) Audiogram
- viii) Electrocardiogram for persons older than 45 years of age, or if indicated during the physical examination
- ix) Drug and alcohol screening, as required by job assignment
- x) Visual acuity
- xi) Follow-up examinations, at the discretion of the examining physician or the corporate medical director

The examining physician provides the individual and employer with a report summarizing the findings confirming the worker's fitness for work and ability to wear a respirator. Documentation of medical clearance will be available for project personnel during all project work.

Subcontractors will certify that all of their personnel have successfully completed a physical examination by a qualified physician. The physical examination must meet the requirements of 29 CFR 1926.65 and 29 CFR 1910.134 as described above. Subcontractors will supply copies of the medical examination certificate for each of their on-Site workers.

Other Medical Examination

In addition to pre-employment, annual, and exit physicals, personnel may be examined:

- i) At any individual's request after known or suspected exposure to toxic or hazardous materials
- ii) At the discretion of the client, SS, SHO, or occupational physician in anticipation of, or after known or suspected exposure to toxic or hazardous materials

iii) At the discretion of the occupational physician

1.1.1 Periodic Exam

Following the placement examination, all personnel must undergo a periodic examination, similar in scope to the placement examination. For individuals potentially exposed over 30 days per year, the frequency of periodic examinations will be annual. For personnel potentially exposed less than 30 days per year, the frequency for periodic examinations may be 24 months or as determined by the physician.

1.1.2 Medical Restriction

When the examining physician identifies a need to restrict work activity, the individual's supervisor must communicate the restriction to the individual, the individual's supervisor, and the SHO. The terms of the restriction will be discussed with the individual and his/her supervisor. Every attempt should be made to keep the individual working, while not violating the terms of the medical restriction.

9. Emergency Procedures

9.1 Introduction Emergency Procedures

Emergencies can range from minor to serious conditions. Various procedures for responding to site emergencies are listed in this section. The PM or SS is responsible for contacting local emergency services, if necessary, for specific emergency situations. Various individual site characteristics will determine preliminary action to ensure that these entry procedures are successfully implemented in the event of an emergency. The project team will address necessary facility/client emergency protocols to ensure compatibility between this document and facility/client programs and expectations.

Field employees will identify the primary (on site) and secondary (off site) evacuation routes to muster locations prior to initiating work. A site map is provided in the Appendix.

At client facilities, site emergencies may be indicated by a fog horn or other loud audible sound. If an adjacent facility's alarm is activated, work will stop immediately, equipment will be de-energized and/or secured as necessary for safety reasons and personnel will go immediately to the secondary evacuation location as indicated in pre-start and tailgate meetings.

Emergency evacuation drills will be conducted as deemed necessary by the SS, and documentation of the drills will be maintained by the SS in project file.

An Emergency Information Sheet containing the hospital location, directions, government agency phone numbers, emergency phone numbers, and a map with directions to the hospital is located in the Appendix.

9.2 Incident, Injury, Illness Reporting And Investigation

Any work related incident, injury, illness, exposure, vehicle accident, property loss and or security issues must be reported to your supervisor, the SS immediately. Stop Work Authority will be implemented. Provide care for any injured persons and secure the scene.

GHD will call the GHD PM and the GHD HSE Help Line. Personnel on site should maintain the work area as it was at the time of the incident until further directions are given by the GHD PM, a GHD Safety Professional. No GHD person on site has the authority to call a regulatory agency (environmental or OSHA); this shall be completed by GHD Leadership Team in conjunction with the client. Emergency medical care or support of fire departments is not a restricted call if immediately necessary to protect life and property.

The GHD PM and HSE Manager will coordinate with on site personnel to gather critical information. The GHD PM is responsible (or their designee) to enter the information into B Wise within a 24 period from time of incident. The GHD PM is also responsible to contact the client, which a positive verbal contact is required. The GHD staff listed above will coordinate the completion of the investigation and placement of information into B Wise. This same group of GHD staff will manage further communications with the client.

The report must be filed for the following circumstances:

- Incident, injury, illness, or exposure of an employee.
- Injury of a subcontractor.
- Damage, loss, or theft of property.
- Any motor vehicle accident, regardless of fault, which involves a company vehicle, rental vehicle, or personal vehicle while the employee is acting in the course of employment.
- Any sting, involving a puncture of the skin must immediately be reported to Work Care and follow all GHD reporting requirements
- Security Issues
- Environmental releases or loss of containment.

Occupational incidents resulting in employee injury or illness will be investigated by the SS. This investigation will focus on determining the cause of the incident and modifying future work activities to eliminate the hazard.

All employees have the right and obligation to report unsafe work conditions, previously unrecognized safety hazards, or safety violations of others. If you wish to make such a report, it may be made orally to your supervisor or other member of management, or you may submit your concern in writing, either signed or anonymously.

9.3 Emergency Equipment/First Aid

Safety equipment will be available for use by site personnel, located within 30 feet of the work area(s), and maintained at the site.

- First Aid kit(s), compliant with local jurisdictional requirements according to number of workers present
- Automated External Defibrillators (AEDs) are optional first aid response equipment for conditions related to heart stoppage. If a unit is on site, designated personnel must be trained in the specific AED unit in addition to First Aid and CPR certification, conduct monthly inspections, and contact listed AED Unit coordinator.
- Emergency eyewash bottles and/or an eyewash station lasting 15 minutes.
- Emergency alarms as a means to alert all personnel instantaneously for an emergency.
- Fire extinguisher (at a minimum, a 2A/10BC will be on site).

9.4 Emergency Procedures For Contaminated Personnel

Whenever possible, personnel should be decontaminated in the contamination reduction zone before administering first aid, without causing further harm to the patient.

- Skin Contact: Remove contaminated clothing, wash immediately with water, and use soap, if available.
- Inhalation: Remove victim from contaminated atmosphere. Remove any respiratory protection equipment. Initiate artificial respiration, if necessary. Transport to the hospital.
- Ingestion: Remove from contaminated atmosphere. Do not induce vomiting if victim is unconscious. Never induce vomiting when acids, alkalis, or petroleum products are suspected. Transport to the hospital, if necessary.

Any person transporting an injured/exposed person to a clinic or hospital for treatment should take with them directions to the hospital and a listing of the contaminants of concern to which they may have been exposed.

Any vehicle used to transport contaminated personnel will be cleaned or decontaminated, as necessary.

9.5 Site Evacuations

In the event of an emergency situation such as fire, explosion, or significant release of toxic gases, project personnel in the field will be notified by established communications to evacuate the area.

In the event of an emergency, GHD personnel will gather at their primary mustering point for a head count. The SS will determine a primary and secondary muster point to be used as an assembly area in the event of an emergency. The secondary muster point will be located at least 90 degrees from the primary. These locations will be communicated to the work crew(s) during the Tailgate Safety Meeting (TGSM) as part of the site specific training prior to commencement of work activities, weekly thereafter, and prior to the advent of potentially threatening weather. Muster points will be identified in the site map attached to the HASP.

9.6 Spill And Release Contingencies

If a spill has occurred, the first step is personal safety, then controlling the spread of contamination, if possible. GHD personnel will immediately contact site management to inform them of the spill and activate emergency spill procedures.

10. Environmental Control Program

10.1 Introduction

This section of the HASP outlines measures to be implemented at the site to prevent hazards associated with environmental conditions.

10.2 Weather Monitoring

The SS will be responsible for checking weather forecasts for the next day and week of work to provide advance notification of any severe weather conditions. Severe weather conditions (e.g., heavy rains) may cause unsafe conditions at the site and in some situations work may have to be stopped.

10.3 Tornado Safety Policy And Procedures

Tornadoes occur most frequently between April and October from 3:00 to 7:00 p.m. but can occur any time. In most cases, tornadoes move from a west/southwest direction. A typical tornado is a swirling storm of short duration with winds up to 300 miles per hour and a near vacuum at its center. It appears as a rotating funnel shaped cloud, from gray to black in color, extending towards the ground from the base of a thundercloud.

Tornadoes usually only cover a limited geographical area and give off a roaring sound. A tornado is the most concentrated and destructive potential weather event at the Site. Tornadoes are usually the result of the interaction of a warm, moist air mass with a cool or cold air mass. Secondary effects of tornadoes include flash flooding, electric power outages, transportation system and communication system disruption, and fires.

Whenever weather conditions develop that indicate tornadoes are expected, the National Weather Service will issue a tornado watch to alert people in a designated area for a specific time period (normally 6 hours) to remain alert for approaching storms. The tornado watch is upgraded to a tornado warning when a funnel cloud (tornado) is actually sighted or indicated by weather radar.

When a tornado is approaching, Site personnel will only have a short time to react. Therefore, Site personnel must be prepared to react during periods of severe weather. Memorize the following tornado danger signs:

- i) Approaching clouds of debris can mark the location of a tornado even if a funnel cloud is not visible
- ii) Before a tornado hits, the wind may die down and the air can become very still/calm
- iii) It is not uncommon to see clear, sunlit skies behind a tornado as they usually occur at/near the trailing edge of thunderstorms.

Tornado Evacuation Procedures

GHD and contractor personnel monitor weather related information provided by National Weather Service. If the National Weather Service issues a tornado warning, Site supervisor will activate the emergency response plan.

The "take shelter" warning signal is a "slow wail" of the alarm system. GHD Site personnel will evacuate the work zone(s) when a tornado watch has been issued by the National Weather Service. Personnel will contact the Project Management team to inform them they are leaving the site and provide them a location of the muster point (shelter) they are going. The Site Supervisor are responsible for work areas, they will check remote areas of the work zone(s) to ensure personnel have reacted to the alert. Personnel must proceed to the Site mustering point (shelter) and wait for further instructions. If a tornado watch is upgraded to a tornado warning, personnel will proceed to the designated tornado shelters. Once inside the shelter, conduct a head count to ensure that personnel are accounted for. In general, stay away from all windows and doors that lead to the outside. Remain in the shelter until the "all clear" signal is given by the Site Supervisor.

The tornado shelter most accessible to GHD personnel should be noted on the site map attached to this HASP

Directions to the shelter are to be communicated to Site personnel during initial Site safety orientation and throughout the tornado season during subsequent safety meetings.

If unable to reach the designated shelter, the best protection in a tornado is usually an underground area. If an underground area is not available, consider small interior rooms on the lowest floor without windows, hallways on the lowest floor away from doors and windows, rooms constructed with reinforced concrete/brick/block with a heavy concrete floor and roof, and protected areas away from doors and windows.

10.4 Rain And Snow

Excessive amounts of precipitation may cause potential safety hazards for work tasks. The hazards that would be most commonly associated are slipping, tripping, or falling due to slippery surfaces.

Severe weather conditions will result in work stoppage and the implementation of further emergency measures.

10.5 Temperature

Site activities are expected to be conducted year round. Temperature extremes may be experienced which require measures to be implemented to prevent health and safety hazards from occurring. Potential hazards arising from temperature extremes are heat stress and cold exposure.

10.6 Wind

High winds may be encountered at the site and these can cause hazards that may affect site personnel health and safety. Preventative measures that will be implemented if necessary are as follows:

- i) Restrict site activities.
- ii) Batten down light equipment or building materials.
- iii) Partially enclose work areas.
- iv) Reduce or Stop Work activities.

10.7 Lightning & Thunder

Light travels at a faster speed than sound, you can see a lightning bolt before the sound of thunder reaches you.

To judge how close lightning is, count the seconds between the flash and the thunder clap. Each second represents about 328 yards/300 meters. If you can count less than 30 seconds between the lightning strike and the thunder, the storm is less than 6.2 miles/10 km away and there is an 80 percent chance the next strike will happen within that 6.2 miles/10 kilometers.

Lightning may strike several miles/kilometers away from the parent cloud and therefore precautions should be taken even if the thunderstorm is not directly overhead.

If you hear thunder or see lightning, stop work immediately and seek safe shelter.

Remain sheltered for 30 minutes after hearing the last thunder before returning to work.

10.8 Outdoor Precautions During Severe Weather

- Keep a safe distance from tall objects, such as trees, hilltops, and telephone poles.
- Avoid projecting above the surrounding landscape. Seek shelter in low lying areas such as valleys, ditches, and depressions, but also be aware of flooding.
- Stay away from water. Don't go boating if a storm threatens. Move to land as quickly as possible if you are on the water. Lightning can strike the water and travel some distance from its point of contact. Don't stand in puddles even if you are wearing rubber boots.
- Stay away from objects that conduct electricity, such as tractors, metal fences, motorcycles, lawnmowers, and tall metal objects.
- Avoid being the highest point in an open area. Holding a conductive tool, holding an umbrella, can make you the tallest object and a target for lightning.
- You are safe inside a car during lightning, but don't park near or under trees or other tall objects, which may topple over during a storm. Be aware of downed power lines, which may be touching your car.
- In a forest, seek shelter in a low lying area under a thick growth of small trees or bushes.
- Be alert for flash floods, which are sometimes caused by heavy rainfall, if seeking shelter in a ditch or low lying area.
- If caught in a level field far from shelter and you feel your hair stand on end, lightning may be about to hit you. Kneel on the ground immediately, with feet together, place your hands on your knees and bend forward. Don't lie flat.
- If you are in a group in the open, spread out, keeping people several yards/meters apart.

10.9 Indoor Precautions During Severe Weather

- Before the storm hits, disconnect electrical appliances including radios and television sets. Do not touch them during the storm.
- Don't go outside unless absolutely necessary.
- Stay away from doors, windows, fireplaces, and anything that will conduct electricity, such as radiators, stoves, sinks, and metal pipes. Keep as many walls as possible between you and the outside.
- Don't handle electrical equipment or telephones. Use battery operated appliances only.

10.10 Flash Flooding

Floods are one of the most common hazards in low lying areas, however not all floods are alike. Some floods develop slowly, while others such as flash floods, can develop in just a few minutes and without visible signs of rain. Additionally, floods can be local, impacting a neighborhood or community, or very large, affecting entire river basins and multiple states.

Flash floods can occur within a few minutes or hours of excessive rainfall, a dam or levee failure, or a sudden release of water held by an ice jam. Flash floods often have a dangerous wall of roaring water carrying rocks, mud and other debris.

Be aware of flood hazards no matter where you live or work, but especially if you are in low-lying areas, near water, behind a levee or downstream from a dam. Even very small streams, gullies, creeks, culverts, dry streambeds or low-lying ground that appear harmless in dry weather can flood.

During the flood

- If any possibility of a flash flood, move immediately to higher ground. Do not wait for instructions to move.
- Be aware of stream, drainage channels, canyons and other areas known to flood suddenly.

If you must prepare to evacuate, you should do the following:

- Do not walk through moving water. Six inches of moving water can make you fall.
- If you have to walk in water, walk where the water is not moving. Use a stick to check the firmness or depth of the ground in front of you.
- Do not drive into flooded areas. If floodwaters rise around your car, abandon the car and move to higher ground if you can do so safely.
- Observe weather in the distance, rain in the hills can cause flooding in the valleys..Do not park your vehicle along streams, rivers or creeks, particularly during threatening conditions.

APPENDIX DOCUMENTS

Chemical Table

Chemical/CAS #	Chemical Name (Synonyms)	Exposure Limits	Routes Of Entry	Symptoms/Health Effects	Chemical Properties	Physical Characteristics	Concentration at Site
1,1,1- Trichloroethane CAS-71-55-6	1,1,1 Trichloroethane Methyl chloroform Chloroethene CAS- 71-55-6	TLV: 350 ppm PEL: 350 ppm STEL: 450 ppm IDLH: 700 ppm	Inhalation Ingestion Skin contact Eye contact	ACUTE: Irritating to eyes, skin and respiratory tract. May affect CNS, heart, liver and kidneys resulting in cardiac disorders and respiratory failure. High level exposure may cause death. CHRONIC: Defatting of the skin, may cause liver damage.	(FP) NE (VP) 100 mm (IP) 11.00 eV (UEL) 12.5% (LEL) 7.5%	Colorless liquid with a mild, chloroform- like odor.	50,000 ug/L
1,1- Dichloroethene CAS-75-35-4	1,1- Dichloroethene 1,1-DCE VDC Vinylidene chloride CAS-75- 35-4	TLV: 5 ppm PEL: NE STEL: NE IDLH: NE	Inhalation Ingestion Skin contact Absorption Eye contact	ACUTE: Irritation of the eyes, skin and respiratory tract. Dizziness, headache, nausea. Ingestion may cause chemical pneumonitis. Exposure could cause lowering of consciousness. CHRONIC: Dermatitis. May cause damage to kidneys and liver. Possible human carcinogen.	(FP) -2°F (VP) 500 mm (IP) 10.00 eV (UEL) 15.5% (LEL) 6.5%	Colorless liquid or gas (>89°F) with a mild, sweet, chloroform- like odor.	43,000 ug/L
Arsenic CAS- 7440-38-2	Arsenic CAS-7440- 38-2	TLV: 0.01 mg/m3 PEL: 0.010 mg/m3 STEL: NE IDLH: 5 mg/m3 (as As)	Inhalation Absorption Ingestion	ACUTE: Contact dermatitis, gastrointestinal disturbances, ulceration of the nasal septum, and respiratory irritation. CHRONIC: Hyperpigmentation of the skin and cancers of the skin, lungs, and lymphatic system.	(FP) NA (VP) 0 mm (approx.) (IP) NA (UEL) NA (LEL) NA	Silver-gray or tin-white, brittle, odorless, solid.	17.3 mg/kg

Chemical/CAS #	Chemical Name (Synonyms)	Exposure Limits	Routes Of Entry	Symptoms/Health Effects	Chemical Properties	Physical Characteristics	Concentration at Site
Barium CAS- 7440-39-3	Barium and soluble compounds as BA (excluding barium sulfate) CAS-7440-39-3	TLV: 0.5 mg/m3 PEL: 0.5 mg/m3 STEL: NE IDLH: 50 mg/m3	Inhalation Ingestion Skin/eye contact	ACUTE: Irritation to the eyes, skin, upper respiratory system; skin burns CHRONIC: Gastroenteritis; muscle spasms; slow pulse; extrasystoles; hypokalemia (low blood potassium)	(FP) NE (VP) 0 mm (IP) NE (UEL) NE (LEL) NE	Yellow-white, slightly lustrous solid.	3230 mg/kg
Carbon Disulfide CAS- 75-15-0	Carbon disulfide Carbon sulfide Carbon bisulfide CAS-75-15-0	TLV: 1 ppm [skin] PEL: 20 ppm STEL: NE IDLH: 500 ppm	Inhalation Absorption (skin) Ingestion	ACUTE: Severe irritation to eyes, skin and respiratory tract. Dizziness, headaches, poor sleep, fatigue, nervousness, anorexia, and weight loss. CHRONIC: Dermatitis, Psychosis, polyneuropathy, Parkinson-like syndrome, ocular changes, and coronary heart disease.	(FP) -22°F (VP) 297 mm (IP) 10.08 eV (UEL) 50.0% (LEL) 1.3%	Colorless to faint yellow liquid with a sweet ether - like odor. (Reagent grades are foul smelling).	1,800 ug/L
Lead (metal) CAS-7439-92-1	Lead (metal) CAS- 7439-92-1	TLV: 0.05 mg/m3 PEL: 0.05 mg/m3 STEL: NE IDLH: 100 mg/m3	Inhalation Ingestion Skin contact Eye contact	ACUTE: Lead is a cummulative poison, however, it may cause eye and skin irritation. CHRONIC: Effects blood, bone marrow, CNS, PNS and kidneys resulting in anemia, convulsions, peripheral nerve disease and kidney impairment. Toxicity to human reproduction or development.	(FP) NA (VP) NA (IP) NA (UEL) NA (LEL) NA	A heavy, ductile, soft, gray solid. Turns tarnished on exposure to air.	3880 mg/kg

Chemical/CAS #	Chemical Name (Synonyms)	Exposure Limits	Routes Of Entry	Symptoms/Health Effects	Chemical Properties	Physical Characteristics	Concentration at Site
Mercury - Elemental and inorganic forms CAS-7439-97-6	Mercury (metal) Quicksilver Liquid silver CAS-7439- 97-6	TLV: 0.025 mg/m3 PEL: 0.1 mg/m3 STEL:N/A IDLH: 10 mg/m3	Inhalation Absorption (skin) Ingestion	ACUTE: Irritation to skin. Vapor inhalation may cause pneumonitis. May effect CNS and kidneys. CHRONIC: May effect CNS and kidneys, resulting in irritability, tremors, speech disorders, mental/memory disturbances. Inflammation/discoloration of gums. Danger of cumulative effects.	(FP) NA (VP) 0.0012 mm (IP) NE (UEL) NA (LEL) NA	Odorless, heavy and mobile silvery- white liquid metal	0.75 mg/kg
PAHs CAS- 65996-93-2	Polyaromatic Hydrocarbons PAHs Coal Tar Pitch Volatiles CAS-65996-93-2	TLV: 0.2 mg/m3 PEL: 0.2 mg/m3 STEL: NE IDLH: 80 mg/m3	Inhalation Ingestion	ACUTE: Bronchitis. CHRONIC: Dermatitis, may cause damage to bladder, kidneys and lungs. Potential occupational carcinogen.	(FP) Varies (VP) NA (IP) Varies (UEL) NA (LEL) NA	Black or dark brown amorphous residue. Properties vary depending upon specific compound.	42.7 mg/kg
TCE CAS-79-01-6	Trichloroethene TCE Trichloroethylene Ethylene trichloride CAS- 79-01-6	TLV: 10ppm PEL: 100ppm STEL: 25ppm IDLH: 1,000 ppm	Inhalation Ingestion Absorption	ACUTE: Irritation to eyes and skin. Ingestion may cause chemical pneumonitis. Affects CNS. Unconsciousness due to exposure. CHRONIC: Dermatitis. Affects CNS, loss of memory. May damage liver and kidneys. Probable human carcinogen.	(FP) NE (VP) 58 mm (IP) 9.45 eV (UEL) 10.5% @ 77°F (LEL) 8.0% @ 77°F	Colorless liquid with a chloroform- like odor. Sometimes dyed blue.	190,000 ug/L

Chemical/CAS #	Chemical Name (Synonyms)	Exposure Limits	Routes Of Entry	Symptoms/Health Effects	Chemical Properties	Physical Characteristics	Concentration at Site
Zinc (metal) CAS-7440-66-6	Zinc (metal) Zinc Oxide CAS-7440- 66-6	TLV: 2 mg/m3 [respirable] PEL: 5 mg/m3 [respirable] STEL: 10 mg/m3 [respirable] IDLH: 500 mg/m3	Inhalation	ACUTE: Metal fume fever; muscle aches, nausea, fever, dry throat, weakness, and lassitude; metallic taste; headache; blurred vision; low back pain. Effects may be delayed. CHRONIC: Decreased pulmonary function. Tightness in chest.	(FP) NA (VP) NA (IP) NA (UEL) NA (LEL) NA	White, odorless solid. Slowly decomposed by water.	3940 mg/kg

Table 2

On-Site Air Monitoring Program Action Levels
Health and Safety Plan
Parcel 3 Remediation, Buffalo, New York

<i>Monitoring Device</i>	<i>Action Level</i>	<i>Action</i>
Photoionization Detector (PID)		
10.6 or greater eV lamp	<1.0 ppm or Background	Full-Face Respirator Available
To be used to investigate any odors	≥ 1.0 ppm and ≤ 5 ppm	Full-face air purifying respirator Level C PPE MSA GME P100 Cartridge
	≥ 5 ppm	Shut down activities. Notify SHO. Implement additional engineering controls
Dust/Particulate - (Impacted Soils/Sludges/Sediments)	<2.0 mg/m ³ or Background	Full-Face Respirator Available
	≥ 2.0 mg/m ³ and <50 mg/m ³	Wear Full-Face Respirator - Level C PPE
	>50 mg/m ³	Shut down activities. Notify SHO.
Carbon Monoxide	>35 ppm	Shut down activities. Notify SHO. Implement additional engineering controls
Combustible Gas Indicator	>10 Percent LEL	Cease operations and move to a safe place. Notify SHO. Do not continue working until conditions are constantly below 10 percent LEL
Oxygen Meter	<19.5 Percent or >23.5 Percent When oxygen levels are outside this range, percent LEL readings are not reliable	Cease operations and move to a safe place. Notify SHO. Do not continue working until oxygen levels are between 19.5 and 23.5 percent

Notes:

SHO Safety and Health Officer

LEL Lower Explosive Limit

PPE Personnel Protective Equipment

ppm parts per million



COVID-19 Guidance for GHD Field Personnel

As you are aware, the COVID-19 outbreak is affecting our people, our clients, and all organizations across the globe. GHD has implemented a comprehensive business continuity plan (BCP) to keep our employees safe while we continue to support our clients through this difficult time. Elements of the BCP will be monitored and adjusted as new information becomes available.

GHD will maintain regular communication with field staff and clients to gather information for project sites, fieldwork and travel.

Symptoms of COVID-19 range from mild to severe flu, and other common respiratory infections, and can include:

- Fever
- Cough
- Difficulty breathing
- Muscle aches
- Fatigue
- Headache
- Sore throat
- Runny nose
- Recent loss of taste or smell
- Nausea or vomiting
- Diarrhea

Guidance for All NA Field Personnel

Outlined below are guidelines for GHD field staff to mitigate exposure to COVID-19 when engaged in fieldwork in North America. If you have any of the symptoms related to COVID-19, you are to remain at home and notify your supervisor.

For all employee mobilization and project site work, the following mitigation measures must be implemented:

Travel

- Check local area restrictions to determine if work can be initiated or continued.
- Check with the GHD Project Manager to ensure the project site work is continuing. Ensure to follow all client guidelines and policies.
- All travel via land, air, or water requires RGM approval.
- No more than one person per vehicle when to and from project sites or traveling within the project site
- The interior (cab) vehicle surfaces (i.e., steering wheel, dash, gearshift, door handles, etc.) must be disinfected daily.
- When refuelling a vehicle, wear gloves and sanitize hands once completed.
- Make as few stops as possible during travels limiting exposure to public spaces; and adhere to Journey Management Plan requirements.
- Avoid close contact with anyone experiencing flu like symptoms during your rest/fuel stops.
- When traveling by air, print and carry a boarding pass rather than electronic boarding pass to prevent airport staff from handling your personal phone.
- Disinfect the aircraft trays and arm rests prior to use.
- A face mask must be worn at all times in the airport, while on the aircraft, in rental car lobbies and while using public transportation.



Site Operations

- All GHD personnel must attend GHD Boarding Pass training and must sign the acknowledgement of training.
- All GHD personnel working at a project site must complete the GHD Boarding Pass Application daily.
- All GHD subcontractors must participate in the completion of the GHD Project Site COVID-19 Screening Questionnaire. Those subcontractor employees who do not pass the screening assessment must immediately leave the site.
- Maintain a distance of 2 m/6 ft. between on-site workers whether in the field or in a meeting setting (video meetings and conference calls are preferable)
- In-person meetings should be limited to key individuals who absolutely need to attend as long as **physical** distancing is maintained.
- Alternate meeting methods must be used in place of face-to-face meetings, such as conference calls, WebEx, Skype or MS Teams.
- Discontinue entering contractor's project site office/trailer.
- Practice **physical** distancing between GHD field staff, GHD subcontractors, client and client contractors. In-person meetings will be eliminated where possible.
- If site meetings are required, request they be conducted outdoors while maintaining **physical** distance.
- During receipt of deliveries at a project site, workers must ensure physical distancing is maintained. The GHD Receiver will not sign or provide a record of sample receipt as a precaution to reduce exposure to contact surfaces (e.g., pens, clipboard, paper, etc.).
- Wear gloves when handling/opening delivery packages.
- During sample deliveries to laboratories, workers must follow the laboratory COVID-19 protocols. Communicate with onsite personnel via text messages, emails, phone calls or two-way radio
- Avoid **physical** greetings (e.g. shaking hands).
- Avoid touching your face. The mucus membranes in your eyes nose and mouth are the primary pathways for the virus to gain entry into your body.
- Cover your mouth and nose with a tissue when you cough, sneeze, or use the inside of your elbow.
- Carry a supply of facial tissues and properly dispose in a receptacle after use.
- Avoid close contact with anyone experiencing flu-like symptoms.
- Sites with stairway access to work task locations are to establish one-way staircases where practicable to minimize worker's contact.
- Projects where multiple work crews are conducting work tasks, evaluate the need to stagger work schedules/shifts, breaks and lunches to maintain physical distancing (2 meters/6 feet)
- Consider total number of workers and where they are allowed to work.
- Where workers cannot maintain physical distance (2 meters/6 feet) to conduct a work task, nitrile gloves, a half face respirator with N95 cartridges and safety glasses must be worn.
- Workers required to wear respiratory protection must complete respiratory protection training (inspection, fit, care, use, cleaning and limitations) and have a current fit test.
- Adequate supply of cleaning and disinfecting products must be available for sanitation of respirator.
- Surgical style or cloth face coverings must be worn in the field at all times when others are present. Wearing of either type does not provide you with sufficient protection to breach the 2m/6 ft. physical distancing requirement.
- Face coverings are not substitutes for respiratory protection (e.g. half face respirator and N95 cartridge). Workers who choose to wear face coverings must understand the limitation of use, as they do not provide total protection from the COVID-19 virus inhalation hazard.
- The on-site trailer/facilities (at GHD controlled sites) shall be cleaned on a daily basis with surfaces disinfected several times a day, on an ongoing basis. Personal sanitation and cleaning supplies shall be available on site (i.e. hand sanitizer and sanitizing wipes) and used frequently to wipe down surfaces such as handles on doors, desks, fridges, microwaves, light switches, thermostats, surfaces in/on portable bathrooms and other equipment they come in contact with.
- Mobile and stationary equipment interior (cab) surfaces shall be disinfected prior to entering the cab and when exiting the cab.



- GHD employees must wear gloves while on site and wash and or/sanitize their hands upon removing them.
- Do not touch your face with gloved hands.
- Clean and disinfect frequently touched surfaces daily, for example, cell phones, computer equipment, headsets, tables, doorknobs, light switches, countertops, handles, railings, desks, toilets, faucets, sinks, and/or other frequent contact surfaces.
- Monitor supply of detergent/disinfectant solution/wipes and PPE to ensure adequate inventory is maintained.
- Do not share personal items such as pens/pencils, phones, notebooks or other equipment between project personnel unless they have been disinfected
- Tools and equipment shall be disinfected often and at the end of each use.
- If tools must be shared, they must be sanitized at the end of each use, prior to being used by others.
- To the extent possible, do not interact with the public during work tasks.
- Practice physical distancing when conducting Daily Tailgate Safety Meetings/Pre-Work Assessments.
- HASPs and JSEAs shall include this guideline and JSA – COVID-19 Field Precautions.
- Where required by local jurisdiction, post the current version of the "COVID-19 Guidance for GHD Field Personnel" or where no trailer is available maintain a copy in the HASP or JSEA.
- Teams working under a HASP must not circulate the daily tailgate sign in sheets. Designate one person to document those in attendance on the sheet.
- Teams working under a JSEA must not circulate the pre-work assessment sheet. Designate one person to document those in attendance on the sheet. As an alternate, staff may document their pre-work assessment using the HSE SMART App (pre-work assessment button).
- If an employee requires First-Aid treatment, the injured employee is to self-administer. If they are unable to self-administer and if the injury is substantial, then Emergency Services may be required.
- The latest information and updates to company operating procedures and precautions regarding COVID - 19 shall be discussed at all safety meetings/pre-work assessments and incorporated into the HASP, JSAs and Job Safety Analysis (JSEA's).
- Upon completion of work, ensure all PPE has been either cleaned/decontaminated or properly disposed of.

Sanitary Facilities

- Project manager must ensure field staff have access to washroom facilities with adequate soap and water and/or alcohol based hand sanitizer for proper hygiene in accordance with local jurisdictional requirements.
- Washroom facilities must be serviced often as required and supplies are to be maintained. (e.g., hand sanitizer (at least 60% alcohol), hand soap, paper towels, water, disinfectant spray/wipes, waste receptacle, etc.).
- Wash your hands with soap and water for at least 20 seconds.
- Post signage on hygiene in English and in the majority workplace language (where jurisdictionally required).

Reporting

- All GHD employees are to self-monitor for flu-like symptoms (cough and shortness of breath) and an increase in their temperature.
- If you or a GHD subcontractor, client or client contractor feel unwell or develop flu-like symptoms, contact your supervisor immediately and email using the Contact Table below to notify your assigned contact persons for your Region. Once notified, an HSE or PT member will then conduct a risk assessment and recommend appropriate preventative measures. Recommend seeking medical evaluation guided by Public Health.



- Notify your Supervisor and Regional GM (using the Contact Table below) if you have had close contact with an individual who tested positive for COVID-19. Once notified, an HSE or PT member will conduct a risk assessment and recommend appropriate preventative measures.

Meals/Breaks

- Prohibit food/coffee trucks from accessing work sites.
- Where there are frequent touch points (e.g. water cooler lid), paper towels should be provided to allow users to avoid skin contact.
- Bring water, meals and snacks with you to avoid stopping at a store or restaurant (where possible). Dine in your vehicle or outside alone. Avoid using the project trailer or site facilities.
- Wash your hands frequently with soap and water for at least 20 seconds, especially after you have been in a public place, blown your nose, coughed, sneezed, or used the rest room, and before eating, drinking or smoking.
- Meals shall be eaten alone or at a minimum distance of approximately 2 m/6 ft., and not in groups.
- Project teams should consider staggering break and lunch schedules to minimize the number of people in close proximity to one another.

Hotel/Accommodations

- Project managers and staff shall avoid independent hotels (where possible) and alternative accommodations. Book rooms at reputable hotel chains and should verify with the hotel appropriate protocols are in place to limit the potential exposure and spread of the virus.
- If an overnight stay is required in a hotel, disinfectant shall be available to clean common contact surfaces in the hotel room (i.e. light switches, remote control, doorknobs, thermostat, toilet handle etc.).

Return to Personal Residence

- Wash/Sanitize hands before entering the home or as soon as you enter.
- Upon return to personal residence remove clothing and launder; wash/shower self in order to practice proper and effective hygiene.
- Remove/change clothing in the same location at home each day to avoid spreading any potential exposure of work apparel in multiple areas of your home (bedding, furniture, etc.).

Canada: Additional Requirements

If fieldwork requires travel between other Provinces and Territories, verify with your RHSEM if the Province/Territory has imposed a mandatory 14-day isolation requirement. If so, this may impede fieldwork.

Contact Table

Canada Regions

Region	e-mail Group	HSE Contact	Regional People Leader
Eastern (Francais)	GMQAR@ghd.com	marylene.provost2@ghd.com	teresa.mambro@ghd.com
Eastern(English)	GMQAR@ghd.com	marylene.provost2@ghd.com	teresa.mambro@ghd.com
Ontario	GMOntario@ghd.com	sandy.serena@ghd.com	alison.bondy@ghd.com mirella.perri@ghd.com
Northwest	malcolm.dixon@ghd.com	wayne.stdenis@ghd.com	alison.bondy@ghd.com



Revised: August 12, 2020

US Regions

	e-mail Group	HSE Contact	Regional People Leader
Mid-Con	midcongmdirect@ghd.com	vicky.pickard@ghd.com	nikki.mcghee@ghd.com
Mid-West	ihsan.alfayyomi@ghd.com	craig.gebhardt@ghd.com	janell.goskey@ghd.com
South East	steven.davie@ghd.com	alan.gallaway@ghd.com	sandra.mcjilton@ghd.com
North East	tom.klin@ghd.com	john.maurer@ghd.com	jennifer@carney@ghd.com
West	ted.whiton@ghd.com	ken.chavez@ghd.com	jim.klein@ghd.com



Job Safety Analysis (JSA)

COVID-19 Precautions – Field Work

Field staff must review job-specific work plan and coordinate with project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each workday. **Stop, Think, Act, Review (STAR)** must be used prior to any activity. All personnel must possess the appropriate training prior to initiating scheduled tasks. Also consider weather conditions. GHD personnel have the authority and responsibility to use **Stop Work Authority (SWA)**.

Date issued/revised:	March 27, 2020	Client:				
Project number:		Created by	Micheal Dixon	Sim OPS	Yes/No	SSE on site? Yes/No
Project address:						
Specific task	Field Work					
Key equipment:	Alcohol-Based Hand sanitizer >60% Alcohol, Disinfectant (e.g. spray bottle/paper towels, wipes, etc.) Nitrile gloves., Surgical or cloth style face coverings					
Task-specific training:						

Hard hat	Gloves (ANSI/EN 388)	Eye protections	Fall protection	APR	Vest	PPE clothing
☐ Type I (top impact)	☒ Chemical protective (i.e. nitrile)	☒ ANSI/CSA safety glasses	☐ Harness	☐ Full face mask	☒ Class II	☐ Coveralls
☐ Type II (side impact)	☐ Level 1 light duty	☐ Goggles/spoggles	☐ Shock absorb lanyard	☐ Half face mask	☐ Class III	☐ Fire retardant clothing (FRC)
☒ Class E (standard)	☐ Level 2 light duty with protection	☐ Face shield	☐ Lifeline		☐ Anti-static	☐ High viz clothing
☐ Class G	☐ Level 3 medium duty	☐ Other*		Cartridges	☐ FRC	☒ Long pants
	☐ Level 4 heavy duty			☐ N95		☒ Long sleeve shirts
Foot protection	☐ High viz	Hearing protection	Arc flash	☐ P100		☐ Paper tyvek
☒ Industrial grade safety boot	☐ Other*	☐ NOT Required	☐ Haz.cat 2	☐ P95		☐ Polyethylene tyvek
☐ Rubber boots (industrial grade)		☐ Required	☐ Haz cat 4	☐ R95		☐ Other *
☐ Hip waders				☐ Organic vapor		
	see key equipment			☐ Specialty/other		

Project development team		Modified by	Reviewed by	Date
Name	Signature			
Sandy Serena			Wayne St. Denis	3-26-2020
		Sandy Serena	Wayne St. Denis	4-06-2020
		Sandy Serena	Wayne St. Denis	5-13-2020
		Wayne St Denis		08-12-2020

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible
1	Travel to GHD Jobsite	- Transmission/exposure on client site - Transmission/exposure across provinces and territories - Transmittal/exposure of COVID-19 between passengers - Transmittal/exposure of COVID-19 from previous occupants (rental and fleet vehicles) - Transmittal/exposure of COVID-19 while refueling/rest stop - Transmittal/exposure of COVID-19 while traveling by air	- Complete GHD Boarding Pass Application for Field daily. - Check with the GHD Project Manager to ensure the project site work is continuing. Ensure to follow all client guidelines and policies. - All travel via land, air, or water requires RGM approval. - Canada - If fieldwork requires travel between other Provinces and Territories, verify if the Province/Territory has imposed a mandatory 14-day isolation requirement. If so, this may impede fieldwork. - Where more than one staff member is travelling to a project site, staff members must travel in separate vehicles to ensure social distancing is maintained. This includes on-site vehicle use to complete work tasks. - The interior (cab) vehicle surfaces (i.e., steering wheel, dash, gearshift, door handles, etc.) of all GHD fleet, leased or owned vehicles must be disinfected prior to each entry into the cab and upon return. Wiped over with disinfectant solution/wipe (use manufacturer recommended PPE). - When traveling by vehicle, ensure to wear gloves when refueling and sanitize hands once complete. - Make as few stops as possible during travels to limit exposure to public spaces; and adhere to Journey Management Plan requirements. - Avoid close contact with anyone experiencing flu like symptoms during your rest/fuel stops. - When traveling by air, print and carry a boarding pass rather than electronic boarding pass to prevent airport staff from handling a personal phone. - When traveling by plane, disinfect the trays and arm rests prior to use.	Field personnel
2	Conduct Tailgate Safety Meeting/Pre-work assessment & Complete H&S Paperwork	Transmittal/exposure of COVID-19 between meeting participants	- Surgical style or cloth face coverings must be worn in the field at all times. - All GHD subcontractors must participate in the completion of the GHD Project Site COVID-19 Screening Questionnaire. Those subcontractor employees who do not pass the screening assessment must immediately leave the site. - Practice physical distancing, maintaining at least 2 metres/6 feet of distance between yourself and others. - Hold meetings outside and keep in mind wind direction. To the extent possible, remain cross-wind from other people. - Do not circulate the daily tailgate/pre-work assessment sign in sheet. Designate one person to document those in attendance on the sheet.	Field personnel

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible
			The latest information and updates to company operating procedures and precautions regarding COVID - 19 shall be discussed at all tailgate meetings and incorporated into the HASP JSAs	
3	All Activities	Transmittal/exposure of COVID-19	- Ask yourself and your Project Managers – is this work essential? Can this be done remotely? Can it be rescheduled? - Ensure project team follow all client guidelines and policies. - Where required by local jurisdiction, post the current version of the “COVID-19 Guidance for GHD Field Personnel” or where no trailer is available maintain a copy in the HASP or JSEA. - Carry nitrile gloves, alcohol-based hand sanitizer, and disinfectant wipes/spray during fieldwork. - Carry a supply of facial tissues and properly dispose in a receptacle after use. - Avoid social greetings (e.g. shaking hands). - Avoid touching your face. The mucus membranes in your eyes nose and mouth are the primary pathways for the virus to gain entry into your body. - Know the symptoms of COVID-19 (Symptoms include fever, cough, and difficulty breathing). - Stay home from work if sick or presenting flu like symptoms or symptoms of COVID-19 - Practice social distancing, maintaining at least 2 metres/ 6 feet of distance between yourself and others. - Cover your mouth and nose with a tissue when you cough, sneeze or use the inside of your elbow. - Clean and disinfect frequently touched surfaces daily, for example, cell phones, computer equipment, headsets, tables, doorknobs, light switches, countertops, handles, railings, desks, toilets, faucets, sinks, and/or other frequent contact surfaces. Wipe over with disinfectant solution/wipe (use manufacturer recommended PPE). If visibly dirty, clean visible dirt/debris before disinfecting. Monitor supply of disinfectant solution/wipes and PPE to ensure an adequate supply.	Field personnel
4	Conduct Site Work	Transmittal/exposure of COVID-19 between site workers and public.	- Avoid close contact with anyone experiencing flu like symptoms. - Wear gloves while on site and wash and or/sanitize their hands upon removing them. Properly dispose of gloves. - Do not touch your face with gloved hands. Take care when removing gloves. - Carry a supply of facial tissues and properly dispose in a receptacle after use. - Discontinue face-to-face Site Meetings. Alternate meeting methods must be used in place of face-to-face meetings, such as conference calls, WebEx, Skype or MS Teams. - Practice social distancing between GHD field staff, GHD subcontractors, client and client contractors. In-person meetings will be eliminated where possible. If multiple work crew are conducting work tasks, evaluate the need to stagger work schedules/shifts to maintain physical distancing (2 meters/ 6 feet). - Where workers cannot maintain physical distance (2 meters/6 feet) to conduct a work task; in addition to nitrile gloves; a half face respirator with N95 cartridges and safety glasses must be worn. Workers required to wear respiratory protection must complete respiratory protection	Field personnel

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible
			training (inspection, fit, care, use, cleaning and limitations) and have a current fit test. Adequate supply of cleaning and disinfecting products must be available for sanitation of respirator. • Face coverings are not substitutes for respiratory protection (e.g. half face respirator and N95 cartridge). Workers who choose to wear face coverings must understand the limitation of use as they do not provide protection from the COVID-19 virus inhalation hazard. Workers who choose to wear a face covering must maintain physical distancing (2meters/ 6 feet) from other workers while wearing them. Sites with stairway access to work task locations, establish one-way staircases where practicable to minimize worker's contact. • Communicate with onsite personnel via text messages, emails, phone calls or two-way radio. • If site meetings are required, request they be conducted outdoors while maintaining social/physical distancing. • Mobile and stationary equipment interior (cab) surfaces shall be disinfected prior to entering the cab and when exiting the cab. • Tools and equipment shall be disinfected often and at the end of use. If tools must be shared, they must be sanitized before use by the next user. Wiped over with detergent/disinfectant solution/wipe before and after each use (use manufacturer recommended PPE). If visibly dirty, clean visible dirt/debris before disinfecting. • To the extent possible, do not interact with the public. If it is necessary, politely explain you are practicing social distance and request they stay at least 2m/ 6 feet away and they do not attempt to pass objects to you. Ensure work zone demarcation is in place to avoid them entering your work space • Do not share personal items such as pen/pencils, phones, notebooks or other equipment between project personnel unless they have been disinfected. • Teams working under a HASP must not circulate the daily tailgate sign in sheets. Designate one person to document those in attendance on the sheet. • Teams working under a JSEA must not circulate the pre-work assessment sheet. Designate one person to document those in attendance on the sheet. As an alternate, staff may document their pre-work assessment using the HSE SMART App (pre-work assessment button). • Due to N-95 respirators being in short supply and social distancing, if an employee requires First Aid treatment, the injured employee should self-administer. If they are unable to self-administer and if the injury is substantial, then Emergency Services may be required. • During receipt of deliveries at the project site, workers must ensure physical distancing is maintained. Request delivery personnel place the package down rather than handing the item directly to the GHD Receiver to maintain physical distancing. The GHD Receiver will provide their name to the Delivery personnel to log GHD's receipt of the items. The GHD Receiver will not sign or provide a record of sample receipt as a precaution to reduce exposure to contact surfaces (e.g., pens, clipboard, paper, etc.). • If required to sign, wear gloves and use your own pen. After signing, remove gloves, dispose of in waste receptacle and wash/sanitize hands. Do not share pens. • Wear gloves when handling/opening delivery packages. Wipe down all exterior surfaces with disinfectant spray/wipes. Dispose of the packaging (as applicable) and gloves in a waste receptacle. Wash/sanitize hands.	

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible
			- Upon completion of work ensure all PPE has been either cleaned/decontaminated or properly disposed of. Wash/sanitize hands. - At the conclusion of the work day/shift before GHD field staff, GHD subcontractors, visitors, clients, client contractors leave the worksite, inquire if they have any flu-like symptoms. - All GHD field staff, GHD subcontractors, visitors, clients, client contractors must wash/sanitize hands before leaving the worksite.	
5	Sanitary Facilities	Transmittal/exposure of COVID-19	- Project manager must ensure staff have access to washroom facilities with soap and water or alcohol based hand sanitizer for proper hygiene in accordance with local jurisdictional requirements. - Washroom facilities must be serviced as often as required and supplies maintained. - Ensure adequate clean-up supplies are available (e.g., hand sanitizer (at least 60% alcohol), hand soap, paper towels, water, disinfectant spray/wipes, waste receptacle, etc.). Remove garbage often. - Clean your hands frequently with soap and water for at least 20 seconds especially after you have been in a public place, or after blowing your nose, coughing, sneezing, or before using the rest room or eating and drinking or smoking. - If soap and water are not available, apply alcohol-based (at least 60%) hand sanitizer and remove visible soiling with paper towels, then re-apply alcohol-based hand sanitizer. Cover all surfaces of your hands and rub them together until they feel dry. - Post signage on hygiene in English and in the majority workplace language (where jurisdictionally required).	
6	Use of Construction Trailers/site office	Transmittal/exposure of COVID-19 between site workers and others.	- Discontinue entering contractor's project site office/trailer. All meetings/discussions are to be completed by telephone or teleconference/videoconference. If in-person meetings are required, request they be conducted outdoors. - Discontinue face-to-face Site Meetings. Alternate meeting methods must be used in place of face-to-face meetings, such as conference calls, WebEx, Skype or MS Teams. - Practice social distancing between GHD field staff, GHD subcontractors, client and client contractors. In-person meetings will be eliminated where possible. Where onsite meeting are required they are to be held outdoors while maintaining social distance. - The on-site trailer/facilities (at GHD controlled sites) shall be cleaned on a daily basis with surfaces disinfected several times a day on an ongoing basis. Personal sanitation and cleaning supplies shall be made available on site (i.e. hand sanitizer and sanitizing wipes) and used frequently to wipe down surfaces such as handles on doors, desks, fridges, microwaves, light switches, thermostats, surfaces in and on portable bathrooms and other equipment that they come in contact with. Wiped over with detergent/disinfectant solution/wipe (use manufacturer recommended PPE).	Field personnel
7	Meals and Breaks	Transmittal/exposure of COVID-19 from food establishment, customers, staff, surfaces.	- Prohibit food/coffee trucks from accessing work sites. - Where there are frequent touch points (e.g. water cooler lid) paper towels should be provided to allow users to avoid skin contact. - Bring water, meals and snacks with you to avoid stopping at a store or restaurant. Dine in your vehicle or outside alone. Avoid using the project trailer or site facilities. - Wash hands and sanitize, before and after eating.	Field personnel

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible
			- Meals shall be eaten alone or at a minimum distance of approximately 2 m (6 ft.) and not in groups. - Project teams should consider staggering break and lunch schedules to minimize the number of people in close proximity to one another. - If you must visit a restaurant, call ahead for take-out or “contactless delivery”. Do not dine in. - Use drive-through when this is an option.	
8	Return to personal residence	Transmittal/exposure of COVID-19 at personal residence	- Wash/Sanitize hands before entering the home or as soon as you enter. - Upon return to personal residence remove clothing and launder; and wash/shower to practice proper hygiene. - Remove change clothing in the same location at home each day to avoid exposure of work apparel to multiple areas with your home (bedding, furniture, etc.) - Place removed work clothes in a bag to keep separate, then wash with detergent prior to re-use. - Maintain regular and thorough hand hygiene while at home.	Field personnel
9	Laboratory Sample Drop	Transmittal/exposure of COVID-19	- During sample deliveries to laboratories, workers must follow the laboratory COVID-19 protocols. Workers must ensure physical distancing is maintained at all times. Request a copy of the chain of custody be emailed to confirm sample receipt as a precaution to reduce exposure to contact surfaces (e.g., pens, clipboard, paper, etc.). - If required to sign paper work, wear gloves and use your own pen. After signing, remove gloves, dispose of in waste receptacle and wash/sanitize hands.	Field personnel
10	Hotel Stay	Transmittal/exposure of COVID-19 from occupants, previous occupants, hotel staff, common areas.	- Avoid independent hotels and alternative accommodations and book rooms at reputable hotel chains and should verify with the hotel that appropriate protocols are in place to limit the potential exposure and spread of the virus. - Verify the hotel chain/brand has modified cleaning procedures to reflect risk of COVID-19. Most hotel companies have issued statements on their websites and in email blasts reflecting these new procedures. - Use the front door, and not peripheral entrances. Front doors of hotels are generally automatic. - Request ground floor room to avoid elevator use. - If elevator use is required, do not directly touch elevator buttons with your hands. Do not ride elevators with other people, to the extent possible. - Bring disinfecting wipes or sanitizing spray. Upon arrival, disinfect high “hand-traffic” areas of the hotel room: Door handles, light switches, shower/sink faucet handles, TV remote, curtain/blind handles or other surfaces. Clean these surfaces daily. - Place the “Do Not Disturb” Sign on your door to prevent people (housekeeping) from entering your room. - Practice social distancing. Maintain a distance of 2 m or 6 ft. Avoid common spaces and hotel sponsored events where crowds will be present. - Confirm hotel cleaning procedures have been modified to address COVID-19. Confirm no COVID-19 cases have occurred in hotel. - Avoid close contact with anyone experiencing flu like symptoms.	Field personnel

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible
			Upon return to hotel at end of shift, remove clothing and launder; and wash/shower to practice good hygiene.	
11	Reporting	- Illness - Exposure to COVID-19	- All GHD employees are to self-monitor for flu-like symptoms (cough and shortness of breath) and an increase in their temperature. - If you or a GHD subcontractor, client or client contractor feel unwell or develop flu-like symptoms, contact your supervisor immediately and email using the Contact Table below to notify your assigned contact persons for your Region. Once notified, an HSE or PT member will then conduct a risk assessment and recommend appropriate preventative measures. Recommend seeking medical evaluation guided by Public Health. - Notify your Supervisor and Regional GM (using the Contact Table below) if you have had close contact with an individual who tested positive for COVID-19. Once notified, an HSE or PT member will conduct a risk assessment and recommend appropriate preventative measures.	

- (1) Each Job or Task consists of a set of steps. Be sure to list all the steps in the sequence that they are performed. Specify the equipment or other details to set the basis for the potential (associated) hazards.
- (2) A hazard is a potential danger. What can go wrong? How can someone get hurt? Consider, but do not limit, the analysis to: **Contact** - victim is struck by or strikes an object; **Caught** - victim is caught on, caught in or caught between objects; **Fall** - victim falls to ground or lower level (includes slips and trips); **Exertion** - excessive strain or stress/ergonomics/lifting techniques; **Exposure** - inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught".
- (3) Aligning with the Job Steps, Task Activity Description, and Potential Hazard columns, describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "be careful" or "use as appropriate".

Site personnel participating in JSA review:

I have participated in the review and discussion of the Job Safety Analysis (JSA) listed on this document and understand the duties I am responsible to fulfill. As part of my work, I know I have the responsibility and obligation to STOP work with a **Stop Work Authority (SWA)** if conditions change and/or potential hazards have been identified.

Name/Company	Sign	Date

SSE(s) on job: _____ Assigned mentor: _____

Presenter signature: _____ Date/Time: _____

My signature below indicates that all conditions and requirements listed above have been verified, met, and reviewed with all affected personnel prior to start of work.

Supervisor signature: _____ Date/Time: _____

Location of mustering point: _____ Wind direction (current): _____

GHD emergency contact (Name and verified phone number): _____

Supervisor signature documenting daily debrief has been completed: _____





GHD

Standard Operating Procedure - HSE

**Infection Control
HSE339**

March 2020

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1. Introduction

The intent of the Infection Control SOP (procedure) is to decrease the spread and impact of infection (e.g. epidemic or pandemic virus) within GHD. This document identifies key objectives, including reducing potential transmission among our people, clients and the communities we operate and maintaining business operations.

During an infectious outbreak (e.g. epidemic or pandemic virus), all persons experiencing flu-like symptoms should stay home and away from the workplace to protect others. Persons, who believe they have been exposed to a person illustrating symptoms, should contact their manager, People Manager or HSE Manager for advice.

Over time, communities will be tested by infectious outbreaks and will likely affect GHD's operations. This procedure aims to address actions to be taken by GHD to minimise further spread within our population and the effect on our business operations.

2. References

World Health Organization COVID-19 page

<https://www.who.int/emergencies/diseases/novel-coronavirus-2019>

US Center for Disease Control COVID-19 page

<https://www.cdc.gov/coronavirus/2019-ncov/index.html>

GHD COVID-19 iConnect page

<https://iconnect.ghd.com/en/BusinessServices/HSE/incident-management/Pages/Coronavirus.aspx>

US Department of Labor COVID-19 Resource page

<https://www.osha.gov/SLTC/covid-19/standards.html>

CDC Interim Guidance for Risk Assessment and Public Health Management of Persons with Potential COVID-19 Exposure

<https://www.cdc.gov/coronavirus/2019-ncov/php/risk-assessment.html>

3. Scope and application

This SOP is applicable to all operations of GHD, Joint Venture and Alliance partners and other key business relationships where GHD maintains control of the work processes and should influence discussion and decisions where GHD is a general partner. This procedure also has application in the activities of our vendors and visitors, as they provide a means of contact with our business.

As GHD has more than one business location, local Regional General Managers, HSE Managers and People Managers will provide the appropriate authority, necessary resources and support to implement this procedure and the other GHD-issued informational materials based on the condition in each locality.

Note: The intensity of an outbreak may differ according to geographic location. Local health officials will be issuing guidance specific to their communities.

Items to consider as part of the application of this procedure are:

- Infection severity (i.e., number of people who are experiencing related symptoms, hospitalisation and death rates) in the community where the office is located;
- Impact of infection on employees that are vulnerable and may be at higher risk of infection and adverse health complications. For example:
 - people 60 and older
 - people with underlying health conditions including heart disease, lung disease, or diabetes
 - people who have weakened immune systems
 - people who are pregnant
- Prepare for possible increased numbers of employee absences due to illness in employees and their family members, closures of early childhood programs and schools due to high levels of absenteeism, illness or quarantine policies:
 - Regional Leadership Teams should monitor and respond to absenteeism at the workplace in order to implement plans to continue essential business functions in case of higher than usual absenteeism.
 - When possible, plan to cross-train personnel to perform essential functions so that the workplace is able to operate even if key staff members are absent.
 - Prepare for alternative working arrangements. Review employees ability to work from home, the equipment required and the processes for accessing GHD systems remotely.
 - Assess essential functions and the reliance that others (e.g., clients, vendors, etc.) and the community have on our services. Be prepared to change our business practices if needed to maintain critical operations (e.g., identify alternative suppliers, prioritize customers, or temporarily suspend some of our local/Regional operations if needed).

4. Risk management

As part of our overall Enterprise risk management strategies, certain key infection control strategies will be put in place to protect our people. These key infection control strategies are obtained from reputable sources such as World Health Organization (WHO) and US Center for Disease Control (CDC) and are to be implemented at the Business, Region and office level as needed to protect GHD employees. If local jurisdictional regulations and orders require the use of additional controls then GHD will implement those additional control measures at the local level.

As a starting point, during a significant infectious outbreak, all persons experiencing related symptoms will be encouraged to stay home and away from the workplace to protect others. In addition, based on a risk assessment GHD will deploy key strategies to minimise the risk of transmission of contagious viruses or similar.

If the measures in this procedure/SOP differ from any of the control measures referenced by a local jurisdiction or government body then the more stringent requirement will be followed.

4.1 Seasonal Flu Vaccine program

- Each Region (managed by the People and HSE Team) will implement an annual Flu vaccination program delivered as close to the date the vaccine becomes available as possible.
- Typically, the flu vaccine process is delivered towards the onset of winter in each hemisphere.
- Measures to track who has been immunised, who missed out due to being out of office (and making alternative arrangements for these people) and who chose not to take up the immunization opportunity will be implemented by the People Manager and in keeping with jurisdictional privacy laws.

4.2 In the event of infectious outbreak in the community

4.2.1 GHD

- GHD will encourage employees to:
 - Not to attend work if they have related symptoms.
 - Sneeze and cough into their sleeve or a tissue which is then disposed of.
 - Wash their hands with soap and water for at least 20 seconds. Soap and water should be used preferentially if hands are visibly dirty.
 - Use tissues and dispose of in no-touch receptacles for use by employees.
 - Supplement hand washing with use of an alcohol-based hand sanitizer that contains greater than 60% alcohol (placed in multiple locations and foyers and in conference rooms). Should a shortage of hand sanitizer occur, additional focus on soap and water washing should be communicated.
- Communicate key infection control measures via email, iConnect and Safety Shares.
- Each office will post informational posters that encourage staying home when experiencing related symptoms, [cough and sneeze etiquette](#), and hand hygiene at key locations within our offices and in other workplace areas where they are likely to be seen.
- Communications via email will be sent to GHD staff from the relevant executive member of GHD management or designee. Email notifications are to be reviewed and approved by GHD Group Manager HSE, Business HSE Leader or designee prior to sending to GHD staff.
- Business Group Leaders will ensure that adequate supplies are maintained and consider the potential future difficulties to obtain items in the future.
- Perform routine environmental cleaning - Each office will frequently clean and disinfect high use areas such as kitchen and bathroom surfaces, workstations and printers and eating areas. Dishwashers must be run on hot water.
 - Use the cleaning agents that are usually used in these areas and follow the directions on the label.
 - No additional disinfection beyond routine cleaning is recommended at this time.
- Provide disposable cleaning disinfecting wipes and encourage employees to wipe down commonly used surfaces (for example, counter tops doorknobs, keyboards, remote controls, desks) on a regular basis.

4.2.2 Employees

- Follow all reasonable instruction of GHD in its efforts to minimise the transfer of the infection amongst our people, clients and communities.
- Should not attend GHD offices or workplaces if illustrating symptoms. Preference for staff to work from home if able to work and if appropriate for role. See [Global Flexible Work Policy](#).
- In the situation of a 'seconded/embedded' employee working in a client's office, the person must follow the conditions established by the client and notify their GHD manager if illustrating symptoms. Further action may be required if the client does not have established protocols in place.
- If outside their home country, experiencing related symptoms employees should:
 - [With permanent operations](#) – contact the local People Team Manager and follow GHD policy for obtaining medical care. In the event of emergency, GHD employee will immediately contact an emergency healthcare provider to receive emergency and/or critical care treatment.
 - [Without permanent operations](#) – contact Chubb Assist for advice and also your manager.
- In the event of a family member being exposed or school shutdown as a result of exposure etc., and a GHD employee is required to take care of said family members, GHD will maintain flexible procedures such as permitting employees to work from home etc., to care for a family member experiencing flu-like symptoms.
- Persons travelling on annual/PTO leave may inadvertently return from leave and either be illustrating symptoms on return or soon after return. People returning from leave:
 - Are encouraged to illustrate common-sense and not attend work until symptom free.
 - May in certain circumstances, be required to undertake additional measures prior to returning to work (e.g. 'self-isolate').
 - If returning from overseas travel then GHD employees will be required to self-isolate for a period of 14 days upon arrival in country (home or abroad). See [Global Flexible Work Policy](#) and [GHD's coronavirus \(COVID-19\) iConnect page](#) for more information.

If late onset of symptoms are experienced (post return into work), employees should immediately leave the workplace and then contact their manager, People Manager or HSE Manager for advice.

4.2.3 Employees travelling

- Check GHD Travel Insurance provisions to confirm if travel is insured.
- Attempt to minimize contact with members of the public and try and maintain at least one metre (three feet) of personal space.
- Follow hygiene and handwashing guidance listed above.
- Check GHD source material (e.g. [GHD's coronavirus \(COVID-19\) iConnect page](#)) for information as self-isolation may be required.
- Check GHD's [Riskline portal](#) and [GHD's coronavirus \(COVID-19\) iConnect page](#) for the latest guidance and follow all travel advisories of GHD and governmental recommendations for each country of travel.
- Check themselves for symptoms before starting travel. GHD employees are responsible for notifying their Manager and staying home if they are experiencing flu-like symptoms.
- Employees who experience flu-like symptoms while traveling or on temporary assignment understand that they should immediately self-isolate, notify their Manager and should promptly call a Chubb Assist for advice if needed. See next section for more details.

4.2.4 Sharing of personal details

Personal Information will be treated in accordance with local privacy laws and the GHD Privacy Policy. For further information, please contact local legal counsel. Personal information will be treated confidentially, however details may be shared to prevent risk to the health and safety of other employees.

In the event a person is being tested for or illustrating symptoms a contact tree will be developed (based on set criteria listed below) and identified employees, clients or other personnel who meet these criteria will be advised of the potential exposure.

Only information relating to the health risk should be shared, and only shared with people impacted by the risk. Employee names should not be included in any written correspondence to people not directly impacted by the health breach.

Employees with concerns around the release of information should advise their Manager, who will escalate this to the Region GM.

4.2.5 Employees exposed to confirmed COVID-19 cases – outside the workplace

Employees may be exposed to persons who are either known or later confirmed as being COVID-19 positive. People who have been in 'first degree' contact with confirmed COVID-19 cases should be isolated in their home for 14 days after exposure.

As this is a known 'first degree' exposure of a GHD employee, a contact tree (see 4.2.6 below) of those close to or working in direct vicinity to the affected person is created, those on the list informed and asked to work from home for 14 days after exposure.

If the person exposed or any one on the contact tree illustrates symptoms while in isolation, they must immediately seek medical attention and notify the People of HSE Manager, so others on the contact tree may be contacted and do the same.

4.2.6 Employees illustrating **"related" symptoms**

- Employees who have flu-like symptoms are recommended to stay home and not return to work until they are free of fever (100.4° F/37.8° C or greater using an oral thermometer), signs of a fever, and any other symptoms for at least 24 hours, without the use of fever reducing or other symptom-altering medicines (e.g. cough suppressants). Consult with the Regional People Team as to whether medical clearance is required prior to returning to work.
- When an employee is first identified in the workplace to be illustrating related symptoms (i.e. have not "self-isolated"):
 - If available, an appropriate N95/P2 respirator mask will be issued to people experiencing flu-like symptoms immediately upon identification.
 - Will be asked to move to an isolated area of the office (e.g. meeting room) and implement international hygiene practices (cover their noses and mouths with a tissue when coughing or sneezing or an elbow or shoulder if no tissue is available), regular hand washing etc., until work from home arrangements are made.
 - Employees will be required to work from home (i.e., a lower risk environment) until they are free of symptoms (asymptomatic) if they are well enough to work.
 - All leave associated with symptomatic individuals will be taken in accordance with People policies (e.g., sick leave). Protocols regarding return to the office prior will be based upon local People policy (e.g., supply of medical certificate).
 - Where there is likelihood of epi/pandemic (i.e., announced by peak health authority) in accordance with GHD's Pandemic Trigger Action Plan, Region GMs will be required to ensure that staff have the ability to, and are trained/familiar with working from home, in advance of any potential outbreak.

- Persons illustrating related symptoms to seek medical attention and be screened for testing.
- GHD Project Directors that use contract or temporary employees will contact the employment company or agency to discuss the importance of persons experiencing flu-like symptoms staying home and encourage the employment agency to develop non-punitive leave policies.

If the affected person satisfies the Medical Authority COVID-19 screening criteria and is tested for COVID-19 this must be made known to the People Manager or HSE Manager immediately.

A contact tree of those close to or working in direct vicinity to the affected person is created, those on the list informed and asked to work from home pending results (if results come back as positive, see 4.2.7 Employee confirmed as COVID-19 positive protocols below).

Close Contact

The definition of close contact (1)(2) is as follows:

- *greater than 15 minutes face-to-face contact in any setting with a suspected / confirmed case in the period extending from 24 hours before onset of symptoms in the confirmed case, and/or*
- *sharing of a closed space with a suspected/confirmed case for a prolonged period (e.g. more than 2 hours) in the period extending from 24 hours before onset of symptoms in the confirmed case*

In a non-office setting, a close contact includes a person meeting any of the following criteria:

1. *Living in the same household or household-like setting (e.g. in a boarding school or hostel).*
2. *A person who spent 2 hours or longer in the same room (such as a GP or ED waiting room; a school classroom; communal room in an aged care facility).*
3. *A person in the same hospital room when an aerosol generating procedure is undertaken on the case, without recommended PPE.*
4. *Aircraft passengers who were seated in the same row as the case, or in the two rows in front or two rows behind a confirmed COVID-19 case.*
5. *Contact tracing of people who may have had close contact on long bus or train trips should also be attempted where possible, using similar seating/proximity criteria.*

Note that healthcare workers and other contacts who have taken recommended infection control precautions, including the use of full PPE, while caring for a symptomatic confirmed COVID-19 case are not considered to be close contacts.

Relevant references:

- *New South Wales Government Fact Sheet for Close Contacts (updated 15 March 2020) – <https://www.health.nsw.gov.au/Infectious/factsheets/Pages/novel-coronavirus-close-contact.aspx>*
- *The Communicable Diseases Network Australia (CDNA) Coronavirus Disease 2019 National Guidelines for Public Health Units (Version 2.0, date 13 March 2020) - [https://www1.health.gov.au/internet/main/publishing.nsf/Content/7A8654A8CB144F5FCA2584F8001F91E2/\\$File/interim-COVID-19-SoNG-v2.0.pdf](https://www1.health.gov.au/internet/main/publishing.nsf/Content/7A8654A8CB144F5FCA2584F8001F91E2/$File/interim-COVID-19-SoNG-v2.0.pdf)*

The RGM will inform the rest of the Region's office that is affected (along with other offices if the person had travelled), using the template communications provided and the Privacy conditions listed in section 4.2.4 above.

Full clean of all high use areas that the person may have contacted by professional cleaners.

Once the results are known:

- *Negative - all return to work (once symptom free)*
- *Positive - refer to Positive Result protocols below*

4.2.7 Employee confirmed as COVID-19 positive

- If a person is diagnosed as COVID-19 positive, they must immediately report this to their Manager, People Manager or HSE Manager, leave the office and self-isolate.
- The People Manager will ensure that employees with a positive COVID-19 diagnosis have access to flexible leave policies which are flexible and consistent with public health guidance.
- The People Manager and HSE Manager will inform other employees who may have come into contact with the infected person of their potential exposure to COVID-19 and commence development of an "exposure tree".
- Confidentiality must be maintained as per jurisdictional legislation and GHD policy.
- Asymptomatic employees potentially exposed to COVID-19 will undergo a risk assessment using either local Health Department provided risk assessment or the CDC guidance for how to conduct a risk assessment. However, local government policies may take precedence in determining whether employees remain in an office and what medical consultation is required.
 - Designated member(s) of the HSE and People Teams will perform the exposure risk assessment and determine any protective measures and safeguards. Based upon the results of the risk assessment, high-risk employee(s) will be asked to seek medical consult and asked to work from home for 14 days after their last potential exposure.
 - Region GMs may determine that all potentially exposed persons quarantine themselves for the 14-day period.
- All absences as a result of 'home isolation' will be documented and maintained by the relevant HSE Manager in the Infection Control Personnel Register. Protocols regarding return to the office following will be based upon local People Policy (e.g. supply of medical certificate).
- It is appreciated that confirmed diagnosis may trigger anxiety and unrest. The People Manager will remind affected persons of GHD's EAP program provisions.
- All surfaces that a confirmed COVID-19 case may have come into contact with require a 'deep clean', prior to employees re-entering. A professional cleaner using the appropriate products and practices must undertake this.

A 'deep clean' is a standard term used for an elevated cleaning scope and includes disinfecting and sanitising of the following (including screens and keyboards):

- High dusting of all vents and light fixtures.
- Vacuum all blinds, drapes, windowsills, tracks, etc.
- Dust all walls and clean all light switches.

- Dust all doors and clean all doorknobs.
- Dust all baseboards.
- Move all furniture and thoroughly vacuum all carpets or scrub all floors. (Make sure to clean all baseboards behind furniture that is usually not cleaned on a regular basis).
- Dust and wipe down all surfaces (as employees to remove everything from their desks).
- Clean and sanitize all computer keyboards and screen.
- Clean all kitchen cabinets, appliances, refrigerator, etc.
- Clean all restroom walls, toilets, urinals, sinks.
- Do a machine scrub on restrooms floors. This will help eliminate urine smell.
- Inspect caulk around the toilets and sinks and address as appropriate.
- Window cleaning.
- Carpet cleaning.
- High ceiling dusting (especially if you have a warehouse).
- Strip and wax

4.2.8 Visitors to GHD offices

- Screening questions appropriate to the nature of the outbreak, local Health advisories and also GHD's local condition will be asked of all visitors at reception prior to being permitted to entering the office.

4.3 Office reduction

The condition facing a GHD office, the isolation measures considered and the public health orders will vary by jurisdiction. However, the decision to reduce operations in an office may be the result of key considerations:

- **Directed** - Local or national authorities have issued a public health order that prohibits people from gathering in public places where close contact may occur, also known as congregate settings. Congregate settings include settings such as shopping centres, movie theatres, stadiums, workplaces, and schools and classroom settings.
- **Based on risk** - If multiple office staff are symptomatic then there is a risk that the office may have widespread dispersion of the virus and thus require large scale disinfection. The office operations should be reduced to an appropriate level (e.g., to increase social distancing). However, specific essential personnel may be provided access based upon Regional GM and HSE approval. A risk assessment and control measures must be in place prior to allowing essential staff to remain in a potentially contaminated building.

In the event of a decision (or requirement) to reduce office operations:

- Refer to GHD Crisis Management Plan:
 - Incident Classification Matrix
 - Office Out of Commission Specific Incident Guide
 - Pandemic Specific Incident Guide

In the case where GHD has determined to reduce based on risk, the Region GM will notify other building occupants and clients of this decision, including the potential impacts.

In all cases, the Crisis Management Team Leader is responsible for determining the frequency of review of the decision to “reduce”.

- The Region will have made the necessary arrangements to enable our people to work from home. Persons working from home during this period will be provided with a laptop **only for** this purpose unless other arrangements are agreed by the Region GM.
- It must be noted that during this period IS Support will be restricted to internet and phone enquiries only.
- Switchboards will be diverted to the closest GHD office.

The intensity of a localised or regional outbreak may differ. There may be an opportunity for GHD employees affected by an office closure to work at other GHD office locations. In order for an office reassignment to occur an exposure risk assessment must occur and the office reassignment be approved by the Executive GM. Any affected employee must possess a No Risk or Low Risk exposure assessment result prior to any office reassignment.

5. **Communication and training resources**

GHD Coronavirus (COVID-19) iConnect page

<https://iconnect.ghd.com/en/BusinessServices/HSE/incident-management/Pages/Coronavirus.aspx>

GHD Infection Control Safety Share

https://iconnect.ghd.com/en/BusinessServices/HSE/building-capability/_layouts/15/WopiFrame.aspx?sourcedoc=/en/BusinessServices/HSE/building-capability/Documents/Safety%20Share%20-%20Infection%20Control%20Feb%202020.pptx&action=default

GHD Coronavirus (2019-nCoV) Safety Share

https://iconnect.ghd.com/en/BusinessServices/HSE/building-capability/_layouts/15/WopiFrame.aspx?sourcedoc=/en/BusinessServices/HSE/building-capability/Documents/Safety%20Share%20-%20Coronavirus%20Feb%202020.pptx&action=default

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Document Status

Rev	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
0	C Harrison	J Maranciak		C Harrison		Mar 2020



COVID-19 Social Distancing Office guidelines

The recent [Safety Share: Pandemic](#) highlights the Social Distancing as a key initiative for implementation. This Guideline unpacks the practical measures to be implemented to reduce exposure within our operations (outside of existing measures to voluntarily isolate):

Working from Home

- Refer to relevant Governmental initiatives regarding social distancing (e.g. mass gatherings)
- Laptops stored for recycling are retrofitted with up to date software – ready for loan
- Staff with laptops instructed to take home every day (including peripherals – charger cords, mouse)
- Where available, excess laptops will be retrofitted and made available as necessary
- Until bandwidth capacity initiatives are complete RGMs to enforce the following:
 - Until an office / floor is required to close please constrain the number of people working from home.
 - If an office or floor within the Region needs to close then prioritize those who require VPN access to meet client obligations.
 - Practices that support the economical use of the VPN – i.e. people do not need to remain on the VPN all of the time. Employees should connect, download (etc. to laptop), and then disconnect.

Minimising movements in our buildings

- Reduce non-essential movements between floors in multi-story buildings
- Greater utilisation of phones and WebEx for in-office meetings and discussions
- Limiting face-to-face meetings to critical project meetings only – limited to 8 people
- Antibacterial cleaning of high use surfaces 3 times a day, including elevator buttons and door handles (may involve disinfectant wipes and sprays)
- Reception Screening Guidelines enforced
- No 'personal' parcel deliveries to GHD buildings
- Discuss and agree on communication methodologies with Clients – as they are concerned about the same things we are.

Cancellation of mass gatherings

- Face-to-face Business School activities cancelled – replacing with virtual medium as necessary
- Face-to-face Region activities above 8 people cancelled or re-organised
- International Travel conditions remain per current conditions
- Domestic Travel conditions to be restricted to “essential travel only” and Regional GM approval required.

Thank you for your cooperation and understanding on this matter.



COVID-19 Visitor Screening Office access guidelines

Dear visitor,

With the rise in the number of confirmed cases of COVID-19 (coronavirus), we have implemented a number of measures in GHD offices to help prevent and slow the spread of the virus and to protect the health of our employees and anyone else visiting our offices.

These measures include advice on increased hygiene in the offices and at home, restricting overseas travel to business critical visits, requesting staff who have visited high-risk areas to work from home.

We are also asking all visitors (clients, vendors and GHD visitors) to our offices, to read and answer the questions below:

Please read the following questions:

1. Have you travelled internationally or been in close contact with, anyone who has travelled internationally in the past 14 days?
2. Have you, in the last 14 days, had contact with anyone who has confirmed or suspected symptoms of COVID-19 (fever, dry cough, body aches, headache, sore throat, runny nose, tiredness, shortness of breath)?
3. Do you have any of the following symptoms? Fever, dry cough, body aches, headache, sore throat, runny nose, tiredness, shortness of breath.

If you answer YES to any of the questions above, we ask you respectfully to postpone your visit, and to inform your GHD contact.

Thank you for your cooperation and understanding on this matter.



Daily Project Site COVID-19 Subcontractor Screening Questionnaire

To be completed by GHD Site Supervisor daily who will ask the following questions listed below and complete a temperature check for all Subcontractors working at a GHD controlled site.

No other person is to touch this form to prevent the transmission of viruses.

Item No.	Questions Please circle the answer	Yes	No
1.0	Are you currently sick?	Yes	No
2.0	Do you currently have any of the following symptoms: sneezing, fever, dry cough, body aches, headache, sore throat, runny nose, tiredness, shortness of breath, new loss of taste or smell?	Yes	No
3.0	Have you, in the last 14 days, had contact with anyone who has confirmed or suspected symptoms of COVID-19 (sneezing, fever, dry cough, body aches, headache, sore throat, runny nose, tiredness, shortness of breath, new loss of taste or smell)?	Yes	No
4.0	Have you travelled internationally or been in close contact with anyone who has travelled internationally in the past 14 days?	Yes	No
5.0	What is person's temperature? Please circle		
	Below 37.4°C/99.32°F Between 37.4°C/99.32°F and 38°C/100.4°F Above 38°C/100.4°F		

If the person has answered yes to any of these questions, or if their temperature exceeds 38°C/100.4°F they will not be allowed to enter/work at a GHD project site. They must leave the site immediately and notify their supervisor for further instructions.

If their temperature is between 37.4°C/99.32°F and 38°C/100.4°F, they will need to have their temperature taken a second time throughout the day to determine the onset of a fever. If the second temperature is still in the yellow range or red, the subcontractor will be asked to leave the site immediately.

Please review with subcontractor:

While on a GHD controlled site you are required to:

- Immediately notify the GHD site supervisor if you start to exhibit any flu-like symptoms.
- Review GHD's COVID-19 site requirements with the GHD Site supervisor.
- Communicate GHD's COVID-19 site requirements to all subcontractors hired by your company.
- Maintain a physical distance of (2 meters/ 6 feet) between site workers.
- Practice proper personal hygiene.
- Clean and disinfect tools and equipment on a regular basis.

Subcontractor	Employee Name	Meets Requirements Yes/No	If No Action Taken?

GHD Site Supervisor Name: _____

Signature: _____

Date: _____

Project Number: _____



Tailgate Safety Meeting Form

Large Group Format - Single Day

Date:		Time:		Project No.:	
Presenter:			Project Name:		

Safety topics/items discussed:

Emergency preparedness:

First Aid Provider(s):		Muster Point:	
		Method of Communication:	
AED Responder:		Fire Extinguisher Location:	
First Aid Kit Location:		Eye Wash Location:	

Site personnel in attendance:

Print Name:	Signature:	Company:



Tailgate Safety Meeting Form

Small Group Format - Multiple Days

Date:		Time:		Project No.:	
Presenter:		Project Name:			

Safety topics/items discussed:

Emergency preparedness:

First Aid Provider(s):		Muster Point:	
		Method of Communication:	
AED Responder:		Fire Extinguisher Location:	
First Aid Kit Location:		Eye Wash Location:	

Print Name	Signature	Company

Date:		Time:		Project No.:	
Presenter:		Project Name:			

Safety topics/items discussed:

Emergency preparedness:

First Aid Provider(s):		Muster Point:	
		Emergency Communication:	
AED Responder:		Fire Extinguisher Location:	
First Aid Kit Location:		Eye Wash Location:	

Print Name	Signature	Company

Management of Change Form

(QSF-006)

Page 1 of 2

Form initiated by: _____		Date initiated: _____	
Initiator's role/responsibility: _____		Project number: _____	
Affected location(s): _____			
Client's management of change documentation attached, if required or applicable: ☐ Yes ☐ N/A			
Type of change:		Duration of change:	
☐ Field operations/SOPs		☐ Permanent	
☐ Equipment		☐ Temporary (specify how long change will be in place):	
☐ Safety			
☐ Project management/resources		☐ Emergency	

Describe the change:

Describe the procedure/task(s) required to complete the change:

Who needs to know about the change and how will you communicate this to them?

Is additional training for GHD people required as a result of this change? ☐ Yes ☐ No

If yes, please describe training needs and those who require it:

Coordination with Business School Learning Centre underway: ☐ Yes ☐ No

Identify any associated risks/hazards/impacts as a result of this change:

Management of Change Form

(QSF-006)

Page 2 of 2

Does the change need to be approved by a client? ☐ Yes ☐ No		
If Yes, state client's name: _____		
Client role/responsibility: _____		
Date authorized by client: _____ (mm/dd/yyyy)		
Change approved by project manager: _____ (please print)		
_____ (signature)		_____ (approval date – mm/dd/yyyy)
Summary:		
Item	Completion date	Confirmed by
1. Task(s) to execute change have been completed	_____	_____
2. Those who need to know have been notified	_____	_____
3. Additional training has been completed	_____	_____
4. Risk(s) have been mitigated	_____	_____
5. Change has been approved by all required parties	_____	_____

Notes:

- Scope: GHD may use the Management of Change Form (QSF-006) to identify and record project additions, revisions, changes, or updates regarding field operations, field SOPs, equipment, safety, resources, or project management.
- Detail: The level of detail to a documented project change is ultimately determined by the project manager and/or any client expectations.
- File location: Correspondence folder of the project file.

(QSF-019)

Project number:	Project name:
Date:	Project location:
Public utility locator:	Public utility locator phone number:
Date of public utility locator request:	Public locator call reference number:
Private utility locator (If applicable):	Private utility locator phone number:

Instructions: This checklist is to be completed by GHD personnel prior to initiation of field activities as a safety measure, to ensure that all underground utility lines, other underground structures, and above-ground power lines are clearly marked in the area selected for boring or excavation.

This completed form is a quality record

Underground Utilities Checklist for GHD Personnel

Pre-Drilling/Excavation Checklist and Utility Clearance Log

Drilling or excavation work may not proceed if any of the questions answered below are answered "No." Implement stop work authority and contact the GHD project manager to discuss and resolve any concerns or issues. Document the reason for a "No" answer in the comments section below.

Yes	No	N/A	
Pre-Mobilization			
☐	☐	☐	1. Has a utility locator request been completed within the last 30 days (verify time limit with state or provincial law)? If no, stop work and comment below.
☐	☐	☐	2. Is a scaled site plan, map or drawing showing the proposed borehole locations attached to this form?
☐	☐	☐	3. Does each borehole and excavation location allow for clear entry and exit, adequate workspace, and a clear path for raising the mast (or boom) and operating the drill rig and all support equipment? Ensure that the minimum OSHA/state/provincial utility clearance requirements between the mast or boom and the power line(s) are met. For instance, OSHA requires a minimum approach distance of 10 feet for systems below 50 kV and an increase of 4" for every 10 kV over 50 kV. Confirm if additional permits are required if the boom or mast will be working 5 meters (15 feet) or less from the electrical lines.
☐	☐	☐	4. Are all of the proposed borehole and excavation locations at least 1.0 meters (3 feet) from any subsurface or above-ground utilities shown on client's building plans? Check here ☐ if plans not provided by client (therefore not applicable to this job).
☐	☐	☐	5. Are all of the proposed borehole and excavation locations at least 1.0 meters (3 feet) from any subsurface or above-ground utilities shown on public right-of-way street improvement or other public property plan or site map?
☐	☐	☐	6. Has the site representative, familiar with the site, indicated no knowledge of any subsurface or above-ground utilities within 3 metres (10 feet) of the proposed borehole and excavation locations? (Review locations with site representative)
☐	☐	☐	7. Are all of the proposed borehole and excavation locations at least 1.0 meters (3 feet) from any subsurface utilities identified during a geophysical survey? Check here ☐ if no geophysical survey has been completed (therefore not applicable to this job).
☐	☐	☐	8. Have all utility locating service providers, notified by the public line locator, marked out their facilities in the vicinity of the borehole and excavation locations or otherwise notified us that they do not have any facilities near the proposed locations? (Attached confirmation and utility locate sheets from public locator)
☐	☐	☐	9. Are all proposed borehole and excavation locations at least 1.5 meters (5 feet) from a visual line connecting two similar looking manhole covers?
☐	☐	☐	10. Are all proposed borehole and excavation locations at least 1.5 meters (5 feet) from a visual line perpendicular to the street from the water, gas, and electrical meters?
☐	☐	☐	11. Are all proposed boring and excavation locations clear of pavement joints, curbs, crash posts, or other engineered structures?
☐	☐	☐	12. Does the ground surface/pavement lack signs of previous excavation (e.g., no pavement subsidence, no differences in pavement texture or relief, no pavement patching)?
Pre-Drilling and Excavation			
☐	☐	☐	13. Has it been verified that the proposed drilling or excavation work will not affect any work currently in progress?
☐	☐	☐	14. Has the drill rig or heavy equipment been inspected prior to use and documented? (See Drill Rig Inspection Checklist or Mobile Equipment Safety Inspection Checklist)
☐	☐	☐	15. Have barricades been erected to prevent unauthorized access, where applicable?
☐	☐	☐	16. Have all known live electrical or product lines within 3 meters (10 feet) of the dig path been visually verified? If no, comment below.
☐	☐	☐	17. For boreholes that have not been cleared or are within 3 meters of a utility:
☐	☐	☐	a. Before drilling have you cleared a hole to 2.4 meters (8 feet) below grade using an air-knife, or equivalent, before drilling and is the diameter of this hole greater than the final outside diameter of the boring? If not required comment below.
☐	☐	☐	b. Does the soil you encountered in the hand-dug hole appear to be native material (i.e., free of clean gravel, clean sand, aggregate base [gravelly sand ~ 10% fines] or other non-native looking material)? If not required comment below.

Have the above concerns been discussed with the GHD project manager?

☐ Yes

☐ No

☐ Not Applicable

Has the start of subsurface work been communicated to the GHD project manager?

☐ Yes

☐ No

☐ Not Applicable

Have the above concerns been discussed with the client?

☐ Yes

☐ No

☐ Not Applicable

Has the scope of work been approved by the client?

☐ Yes

☐ No

☐ Not Applicable

Comments: _____

GHD field representative name: _____

Date: _____



Site Health and Safety Plan Amendment Form

This document is to be completed for ANY changes that occur within the Site Health and Safety Plan (HASP). This document is to be sent to the Regional Safety & Health Manager (RSHM) for review, verification and sign off of the HASP.

Amendment #	
Site Name/Project ID	
Date	
Client Contact (same/change)	
Reason for Amendment (SOW change, JSA addition, Chemical, etc.)	
Alternate or Additional Safeguard Procedures	
Required changes in PPE	
Additional Comments:	

Project Manager Notified	☐
RSHM Notified	☐
Client PM Notified (if necessary)	☐

Site HSE Officer (sign above)	Date

The Project Manager is ultimately responsible for the accuracy of the information on this amendment and ensuring any changes to the original HASP is discussed with all affected site personnel prior to commencing work

This original form must be placed in the project file and a copy needs to be attached to the Site Health and Safety Plan (HASP).

HASP Acknowledgment Sheet

Project Name:_____ Project Number: _____

This is to certify that I have received a pre-entry briefing regarding this HASP, and I understand its contents. My failure to follow and comply with the requirements contained in this plan may result in disciplinary action and/or termination.

Print Name	Signature	Date



Job Safety Analysis (JSA)

Insert Name : Surveying-Land Surveying

Field staff must review job specific work plan and coordinate with project manager to verify that all up front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each workday. **Stop, Think, Act, Review (STAR)** must be used prior to any activity. All personnel must possess the appropriate training prior to initiating scheduled tasks. Also consider weather conditions. GHD personnel have the authority and responsibility to use **Stop Work Authority (SWA)**. Review this JHA initially and in the field prior to initiating the job, using the P66 RM "Go Card" to assist in identifying specific site hazards. Document by "dirtying" this JHA.

Date Issued/Revised:	09/21/2021 22:13:50	Client:	Jenesis Development, LLC		
Project Number:	11219347	Created By:	System - Copy	SIM OPS? YES/NO	SSE on site? YES/NO
Project Address:	1130 Niagara Street Buffalo				
Key Equipment:	Flag or paddle Additional PPE: Class II vest; leather gloves to mob/demob equipment				
Task-specific Training:	Flagger Safety; Traffic Control Devices; Personal Protective Equipment				

Hard Hat	Gloves (ANSI/EN 388)	Eye Protection	Fall Protection	APR	Vest	PPE Clothing
☐ Type 1 (Top Impact)	☐ Chemical Protective (ie.Nitrile)	☒ ANSI/CSA Safety Glasses	☐ Harness	☐ Full Face Mask	☒ Class II (standard)	☐ Coveralls
☐ Type 2 (Side Impact)	☒ Level 1 - Light Duty	☐ Goggles/Spoggles	☐ Shock Absorbing Lanyard	☐ Half Face Mask	☐ Class III (Night or Highway Traffic)	☐ Fire Retardent Clothing (FRC)
☒ Class E (standard)	☐ Level 2 - Light Duty with Protection	☐ Face Shields	☐ Lifeline		☐ Anti-Static	☐ High Viz Clothing
☐ Class G	☐ Level 3 - Medium Duty	☐ Other*		Cartridges	☐ FRC	☐ Long Pants
	☐ Level 4 - Heavy Duty			☐ N95	☐ PFD	☐ Long Sleeve Shirts
Foot Protection	☐ High Viz	Hearing Protection	Arc Flash/Shock Protection	☐ P100		☐ Paper Tyvek (disposable)
☒ Industrial Grade Safety Boot	☐ Other*	☐ NOT Required for this task	☐ Hazard Category 2	☐ P95		☐ Polyethylene Tyvek

Hard Hat	Gloves (ANSI/EN 388)	Eye Protection	Fall Protection	APR	Vest	PPE Clothing
☐ Rubber Boots (industrial grade)		☒ Required	☐ Hazard Category 4	☐ R95		☐ Other*
☐ Hip Waders				☐ Organic Vapour		
	* see key equipment			☐ Speciality*		

Project Development Team		Modified by	Reviewed by	Date
Name	Signature			
Katherine (kathy) Galanti				

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible (Print first and last names)
1	Mob equipment to surveying area with GHD vehicle	• Lifting hazards • Manual material handling • Back injury • Pinch points • Moving or flying projectiles inside vehicle while transporting equipment • Slip/trip/fall hazards • Biological hazards	• Reduce travel distance when there is a need to carry/lift materials • Make sure grip is adequate; wear leather/cotton gloves • Size up the load; if the object is too large or odd shaped OR is in excess of 50 pounds (23 kg) then assistance (mechanical or a buddy lift) will be required • Lift with the legs (bend at the knees and use the leg muscles) to protect the lower back and keep lower back in a neutral position • Avoid one handed carrying if possible; maintain awareness of footing • Review JSA and HASP • Practice STAR • Properly secure all equipment inside the vehicle	Survey Team
2	Note traffic flow	• Struck by oncoming traffic • Slip/trip/fall • Biological hazards • Threatening dogs	• Stage the GHD vehicle to aid in the protection of the survey crew if they need to set up a Temporary Traffic Control Zone (TTCZ) • Review JSA and HASP • Practice STAR	Survey Team
3	Develop the Temporary Traffic Control Plan (TTCP) and set up the Temporary Traffic Control Zone (TTCZ)	• Struck by oncoming traffic • Slip/trip/fall • Biological hazards • Threatening dogs • Lifting hazards • Manual material handling • Back injury • Heat/cold stress	• Review the requirements of the TTCP ahead of time • Make sure that all temporary traffic control equipment (signs/cones/etc.) is available • Carefully set up TTCZ using the buddy system • Refer to step 1 and HASP for additional lifting methods/information • Position truck with flashers on for added protection • Follow hot/cold stress procedures presented in the HASP • Review JSA and HASP • Practice STAR	Survey Team
4	General use of tools	• Struck by oncoming traffic • Slip/trip/fall hazards • Biological hazards • Threatening dogs • Potential injuries from misuse of tools or use of tools in disrepair	• Wear ANSI Class II reflective safety vest, safety toed boots, and hard hat • Do not use old or faded PPE • Inspect tools • Repair/replace tools as necessary • Review JSA and HASP • Practice STAR	Survey Team
5	Conduct survey activities	• Struck by oncoming traffic • Slip/trip/fall hazards • Biological hazards • Threatening dogs	• Surveyor will enter roadway after clearance from flag person • Surveyor will maintain contact with flag person during survey • Make sure that proper PPE is being worn • Review JSA and HASP • Practice STAR	Survey Team
6	Exit roadway	• Struck by oncoming traffic • Slip/trip/fall hazards • Biological hazards • Threatening dogs	• Surveyor should exit roadway first, followed by flag person nearest oncoming traffic (spotter) • Review JSA and HASP • Practice STAR	Survey Team

1. Each Job or Task consists of a set of steps. Be sure to list all the steps in the sequence that they are performed. Specify the equipment or other details to set the basis for the potential (associated) hazards.
2. A hazard is a potential danger. What can go wrong? How can someone get hurt? Consider, but do not limit, the analysis to: **Contact** - victim is struck by or strikes an object; **Caught** - victim is caught on, caught in or caught between objects; **Fall** - victim falls to ground or lower level (includes slips and trips); **Exertion** - excessive strain or stress/ergonomics/lifting techniques; **Exposure** - inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught".
3. Aligning with the Job Steps, Task Activity Description, and Potential Hazard columns, describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "be careful" or "use as appropriate".

Site Personnel Participating in JSA Review:

I have participated in the review and discussion of the Job Safety Analysis (JSA) listed on this document and understand the duties I am responsible to fulfill. As part of my work, I know I have the responsibility and obligation to STOP work with a Stop Work Authority (SWA) if conditions change and/or potential hazards have been identified.

Name/Company	Sign	Date

**SSE(s) on job:** _____**Assigned mentor:** _____

Presenter Signature: _____

Date/Time: _____

My signature below indicates that all conditions and requirements listed above have been verified, met, and reviewed with all affected personnel prior to start of work.

Supervisor Signature: _____

Date/Time: _____

Location of Mustering Point: _____

Wind direction (current): _____

GHD Emergency contact (Name and verified phone number): _____

Supervisor Signature documenting Daily Debrief has been completed: _____



Job Safety Analysis (JSA)

Insert Name : Mobilization-Demobilization

Field staff must review job specific work plan and coordinate with project manager to verify that all up front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each workday. **Stop, Think, Act, Review (STAR)** must be used prior to any activity. All personnel must possess the appropriate training prior to initiating scheduled tasks. Also consider weather conditions. GHD personnel have the authority and responsibility to use **Stop Work Authority (SWA)**. Review this JHA initially and in the field prior to initiating the job, using the P66 RM "Go Card" to assist in identifying specific site hazards. Document by "dirtying" this JHA.

Date Issued/Revised:	09/21/2021 22:13:50	Client:	Jenesis Development, LLC		
Project Number:	11219347	Created By:	System - Copy	SIM OPS? YES/NO	SSE on site? YES/NO
Project Address:	1130 Niagara Street Buffalo				
Key Equipment:	#360 degree topper				
Task-specific Training:	#				

Hard Hat	Gloves (ANSI/EN 388)	Eye Protection	Fall Protection	APR	Vest	PPE Clothing
☐ Type 1 (Top Impact)	☐ Chemical Protective (ie.Nitrile)	☐ ANSI/CSA Safety Glasses	☐ Harness	☐ Full Face Mask	☐ Class II (standard)	☐ Coveralls
☐ Type 2 (Side Impact)	☒ Level 1 - Light Duty	☐ Goggles/Spoggles	☐ Shock Absorbing Lanyard	☐ Half Face Mask	☐ Class III (Night or Highway Traffic)	☐ Fire Retardent Clothing (FRC)
☐ Class E (standard)	☐ Level 2 - Light Duty with Protection	☐ Face Shields	☐ Lifeline		☐ Anti-Static	☐ High Viz Clothing
☐ Class G	☐ Level 3 - Medium Duty	☐ Other*		Cartridges	☐ FRC	☐ Long Pants
	☐ Level 4 - Heavy Duty			☐ N95	☐ PFD	☐ Long Sleeve Shirts
Foot Protection	☐ High Viz	Hearing Protection	Arc Flash/Shock Protection	☐ P100		☐ Paper Tyvek (disposable)
☒ Industrial Grade Safety Boot	☐ Other*	☐ NOT Required for this task	☐ Hazard Category 2	☐ P95		☐ Polyethylene Tyvek
☐ Rubber Boots (industrial grade)		☐ Required	☐ Hazard Category 4	☐ R95		☐ Other*

Hard Hat	Gloves (ANSI/EN 388)	Eye Protection	Fall Protection	APR	Vest	PPE Clothing
☐ Hip Waders				☐ Organic Vapour		
	* see key equipment			☐ Speciality*		

Project Development Team		Modified by	Reviewed by	Date
Name	Signature			
Katherine (kathy) Galanti				

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible (Print first and last names)
1	Discuss STAR and SWA	Site personnel not aware of STAR and SWA	- Project team (GHD) discusses importance of and documentation procedures for SWA during pre job safety meeting - Use SWA to stop any work that is unsafe	
2	Check weather	- Unexpected storm - Fog, rain, snow; lightening/thunder - Heat/cold stress	- Check local weather forecast - If adverse weather conditions are likely, prepare a contingency plan for lodging, etc. with project manager - Discuss weather issues and precautions to take while driving and on site during the pre job safety meeting - If weather conditions (e.g., fog, rain, snow, etc.) impair the ability/vision of the driver, exit at nearest safe location and assess the situation - While on site, at first sign of lightening/thunder utilize SWA and assess weather conditions - In extreme temperatures, ensure all personnel have proper clothing, hydration, and heat/cold protection (e.g., canopy, fan, glove warmers)	
3	Load equipment into vehicle	- Lifting hazards - Manual material handling - Back injury - Cuts - Pinch points - Hand/foot injury - Forgotten or damaged equipment	- Reduce travel distance when there is a need to carry/lift materials - Make sure grip is adequate; wear leather/cotton gloves - Size up the load; if the object is too large or odd shaped OR is in excess of 50 pounds (23 kg) then assistance (mechanical or a buddy lift) will be required - Maintain neutral back posture - Lift with the legs (bend at the knees and use the leg muscles) to protect the lower back and make sure to shift with the feet rather than twisting at the back - Maintain neutral wrist posture when lifting, carrying, pushing or pulling. The wrist is the strongest and most stable when it is straight. - Avoid one handed carrying if possible; maintain awareness of footing - Avoid placing hands/fingers in pinch point locations - Wear safety toed boots - Verify requested equipment against warehouse form - Load equipment in an organized manner to prevent shifting during transport or use cargo netting	

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible (Print first and last names)
4	Complete GHD Daily Operator Vehicle Checklist	• Damaged vehicle lights, tires, windows, mirrors, horn • Inadequate vehicle documents and/or safety items	• Check for fluid leaks under vehicle • Test operation of headlights, front/rear turn signals, backup lights, brake lights, and emergency flashers • Visually check the pressure/wear of tires • Ensure the vehicle has a spare tire • Assure windshield and window glass is clean and free from obstructions • Test the windshield wipers and horn • Verify vehicle registration, insurance card, and inspection sticker is present and valid • Ensure the vehicle contains a first aid kit, fire extinguisher, and road hazard kit • Check immediate vehicle perimeter and initial path of travel for obstructions (360 walk around)	
5	Check and adjust seat, steering wheel, headrest, and mirrors	• Back/body strain • Blind spot • Impaired vision	• Adjust seat, headrest, and steering wheel height so body is fully supported/comfortable and pedals are within easy reach • Ensure mirrors are properly adjusted	
6	Fasten seat belt(s) and ensure passenger(s) seat belts are fastened	• Serious injury, ejection, or death from collision and/or traffic citation	• Verify driver and passenger(s) seat belts are in good condition and properly latched	
7	Ensure vehicle doors are locked	• Serious injury, ejection, or death from collision • Unwanted intrusion • Lost equipment	• Manually lock all doors to vehicle	
8	Start engine and check gauges and warning lights	• Vehicle breakdown	• Verify sufficient fuel and other hazard lamps (e.g., battery, oil, and temperature) are not lit	
9	Mobilize to site	• Arriving late • Collision • Injury or death to occupants or other parties	• Do not use cell phones or perform other distracting activities while vehicle is in motion • Constantly scan intersections, move eyes, check mirrors, and assess traffic lights (fresh vs. stale) • Maintain safety cushion around vehicle (front, sides, and rear) and 4 second following distance • Utilize all driving defensive techniques	
10	Arrive at site	• Pedestrian injury • Collision	• Maintain awareness of pedestrian/vehicular traffic when entering site and traveling to work zone	

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible (Print first and last names)
11	Park vehicle	• Pedestrian injury • Collision • Property damage	• Maintain awareness of pedestrian/vehicular traffic • Park vehicle in pull through parking space or facing the exit • Parking in a parking space that is not a designated parking space will require the placement of the 360 degree topper on the hood of the vehicle • Use caution and mirrors/spotter when backing vehicle • Set parking brake	
12	Demobilization	• Collision • Injury or death to occupants or other parties	• Check immediate vehicle perimeter and initial path of travel for obstructions (360 walk around) • Maintain awareness of pedestrian/vehicular traffic when exiting site • Utilize defensive driving techniques	

1. Each Job or Task consists of a set of steps. Be sure to list all the steps in the sequence that they are performed. Specify the equipment or other details to set the basis for the potential (associated) hazards.
2. A hazard is a potential danger. What can go wrong? How can someone get hurt? Consider, but do not limit, the analysis to: **Contact** - victim is struck by or strikes an object; **Caught** - victim is caught on, caught in or caught between objects; **Fall** - victim falls to ground or lower level (includes slips and trips); **Exertion** - excessive strain or stress/ergonomics/lifting techniques; **Exposure** - inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught".
3. Aligning with the Job Steps, Task Activity Description, and Potential Hazard columns, describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "be careful" or "use as appropriate".

Site Personnel Participating in JSA Review:

I have participated in the review and discussion of the Job Safety Analysis (JSA) listed on this document and understand the duties I am responsible to fulfill. As part of my work, I know I have the responsibility and obligation to STOP work with a Stop Work Authority (SWA) if conditions change and/or potential hazards have been identified.

Name/Company	Sign	Date

**SSE(s) on job:** _____**Assigned mentor:** _____

Presenter Signature: _____

Date/Time: _____

My signature below indicates that all conditions and requirements listed above have been verified, met, and reviewed with all affected personnel prior to start of work.

Supervisor Signature: _____

Date/Time: _____

Location of Mustering Point: _____

Wind direction (current): _____

GHD Emergency contact (Name and verified phone number): _____

Supervisor Signature documenting Daily Debrief has been completed: _____



Job Safety Analysis (JSA)

Insert Name : Environmental-Site Recon and Walkthrough

Field staff must review job specific work plan and coordinate with project manager to verify that all up front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each workday. **Stop, Think, Act, Review (STAR)** must be used prior to any activity. All personnel must possess the appropriate training prior to initiating scheduled tasks. Also consider weather conditions. GHD personnel have the authority and responsibility to use **Stop Work Authority (SWA)**. Review this JHA initially and in the field prior to initiating the job, using the P66 RM "Go Card" to assist in identifying specific site hazards. Document by "dirtying" this JHA.

Date Issued/Revised:	09/21/2021 22:13:52	Client:	Jenesis Development, LLC		
Project Number:	11219347	Created By:		SIM OPS? YES/NO	SSE on site? YES/NO
Project Address:	1130 Niagara Street Buffalo				
Key Equipment:	Basic PPE, hand/power tools based on site condition, site inspection checklist or notebook, JSA forms, pens, flashlight. Additional PPE: Insect repellant. Coveralls may be necessary based on type of brush/plants/insects in work area(s) being inspected. Leather gloves if overgrown vegetation or rundown buildings.				
Task-specific Training:	SMART Safety training (STAR), JSA development, Poison Plant Identification				

Hard Hat	Gloves (ANSI/EN 388)	Eye Protection	Fall Protection	APR	Vest	PPE Clothing
☐ Type 1 (Top Impact)	☐ Chemical Protective (ie.Nitrile)	☒ ANSI/CSA Safety Glasses	☐ Harness	☐ Full Face Mask	☒ Class II (standard)	☒ Coveralls
☐ Type 2 (Side Impact)	☒ Level 1 - Light Duty	☐ Goggles/Spoggles	☐ Shock Absorbing Lanyard	☐ Half Face Mask	☐ Class III (Night or Highway Traffic)	☐ Fire Retardent Clothing (FRC)
☒ Class E (standard)	☐ Level 2 - Light Duty with Protection	☐ Face Shields	☐ Lifeline		☐ Anti-Static	☐ High Viz Clothing
☐ Class G	☐ Level 3 - Medium Duty	☐ Other*		Cartridges	☐ FRC	☐ Long Pants
	☐ Level 4 - Heavy Duty			☐ N95	☐ PFD	☐ Long Sleeve Shirts
Foot Protection	☐ High Viz	Hearing Protection	Arc Flash/Shock Protection	☐ P100		☐ Paper Tyvek (disposable)

Hard Hat	Gloves (ANSI/EN 388)	Eye Protection	Fall Protection	APR	Vest	PPE Clothing
☒ Industrial Grade Safety Boot	☐ Other*	☒ NOT Required for this task	☐ Hazard Category 2	☐ P95		☐ Polyethylene Tyvek
☐ Rubber Boots (industrial grade)		☐ Required	☐ Hazard Category 4	☐ R95		☒ Other*
☐ Hip Waders				☐ Organic Vapour		
	* see key equipment			☐ Speciality*		

Project Development Team		Modified by	Reviewed by	Date
Name	Signature			
Katherine (kathy) Galanti				

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible (Print first and last names)
1	Discuss STAR and SWA	Site personnel not aware of STAR and SWA	- Project team discusses importance of and documentation procedures for SWA during pre-job safety meeting - Use SWA to stop any work that is unsafe	All persons on project team
2	Check weather	- Unexpected storm, fog; rain; snow; lightening, thunder - Heat/cold stress, including frostbite and sunburn	- Check local weather forecast - Discuss weather issues and precautions to take while driving and on site during the pre job safety meeting - If weather conditions (e.g., fog, rain, snow) impair the ability/vision of the driver, exit at nearest safe location and assess the situation - While on site, at first sign of lightning/thunder utilize SWA and assess weather conditions - In extreme temperatures, ensure all personnel have proper clothing, which includes either a helmet liner or hat/mask that will cover exposed skin on one's face and ears, hydration, and heat/cold protection (e.g., canopy, fan, glove warmers) - Implement the "Buddy System." The site supervisor shall also keep close tabs on all project personnel working in extreme temperatures.	Assessor
3	Sign in	Client/site security not aware of GHD staff presence at site	- Sign in at front desk - Ensure client PM notified of site visit in advance	
4	Don necessary GHD and client required PPE	Contact with impacted soil, brush, sharp/rough stones	Wear all required PPE (hard hat, vest, boots, and glasses) at all times while in the facility	
5	Unload equipment from vehicle	- Lifting hazards - Back injury - Manual material handling - Cuts - Pinch points - Hand/foot injury - Forgotten equipment - Damaged equipment	- Reduce travel distance when there is a need to carry/lift materials - Make sure grip is adequate; wear leather/cotton gloves - Size up the load; if the object is too large or odd shaped OR is in excess of 50 pounds (23 kg) then assistance (mechanical or a buddy lift) will be required - Lift with the legs (bend at the knees and use the leg muscles) to protect the lower back and keep lower back in a neutral position - Avoid one handed carrying if possible; maintain awareness of footing - Wear leather/cotton gloves and avoid placing hands/fingers in pinch point locations - Wear steel toed boots - Verify requested equipment against warehouse form - Load equipment in an organized manner to prevent shifting during transport or use cargo netting	Assessor

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible (Print first and last names)
6	Complete site inspection and walkover of the property and work areas – Note any hazards that will impact site personnel and/or their operations	• Slip/trip/fall hazards • Insects • Pedestrian injury • Poisonous plants	• Check in with site personnel and sign appropriate visitor or safety log (may require watching safety video [i.e., plant]) • Check with site contact to determine safely accessible areas and areas where PPE are required • Wear PPE as directed by site personnel or dependent upon your evaluation of conditions • If building(s) looks dilapidated or in poor condition, do not enter • Watch for vehicles or other mobile equipment moving around • Make sure areas are well lit and you are accompanied by a site representative (if applicable) • Watch where you step on pavement (potholes, dips, or obstructions) and in vegetated/wooded areas (dips, holes, branches, vines, etc.) • Do not take photographs while walking • Do not talk on cell phone while walking • If in vegetated or wooded areas, watch for beehives, wear insect repellent (if area and season dictate) as needed, be mindful of gopher holes/tunnels, small animal dens, snakes, stray dogs/cats, transient/homeless individuals, poison ivy/oak/sumac, etc.	Assessor
7	Sign out	• Client/site security not aware that GHD staff have left facility	• Sign out at front desk	
8	Demobilization	• Collision • Injury or death to vehicle occupants or other parties	• Perform perimeter vehicle check • Maintain awareness of pedestrian/vehicular traffic when exiting the site • Utilize defensive driving techniques • Complete post departure checklist and report vehicle problems to company vehicle maintenance manager or rental car agency	Assessor

1. Each Job or Task consists of a set of steps. Be sure to list all the steps in the sequence that they are performed. Specify the equipment or other details to set the basis for the potential (associated) hazards.
2. A hazard is a potential danger. What can go wrong? How can someone get hurt? Consider, but do not limit, the analysis to: **Contact** - victim is struck by or strikes an object; **Caught** - victim is caught on, caught in or caught between objects; **Fall** - victim falls to ground or lower level (includes slips and trips); **Exertion** - excessive strain or stress/ergonomics/lifting techniques; **Exposure** - inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught".
3. Aligning with the Job Steps, Task Activity Description, and Potential Hazard columns, describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "be careful" or "use as appropriate".

Site Personnel Participating in JSA Review:

I have participated in the review and discussion of the Job Safety Analysis (JSA) listed on this document and understand the duties I am responsible to fulfill. As part of my work, I know I have the responsibility and obligation to STOP work with a Stop Work Authority (SWA) if conditions change and/or potential hazards have been identified.

Name/Company	Sign	Date

**SSE(s) on job:** _____**Assigned mentor:** _____

Presenter Signature: _____

Date/Time: _____

My signature below indicates that all conditions and requirements listed above have been verified, met, and reviewed with all affected personnel prior to start of work.

Supervisor Signature: _____

Date/Time: _____

Location of Mustering Point: _____

Wind direction (current): _____

GHD Emergency contact (Name and verified phone number): _____

Supervisor Signature documenting Daily Debrief has been completed: _____



Job Safety Analysis (JSA)

Insert Name : Construction Oversight

Field staff must review job specific work plan and coordinate with project manager to verify that all up front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each workday. **Stop, Think, Act, Review (STAR)** must be used prior to any activity. All personnel must possess the appropriate training prior to initiating scheduled tasks. Also consider weather conditions. GHD personnel have the authority and responsibility to use **Stop Work Authority (SWA)**. Review this JHA initially and in the field prior to initiating the job, using the P66 RM "Go Card" to assist in identifying specific site hazards. Document by "dirtying" this JHA.

Date Issued/Revised:	09/22/2021 19:15:05	Client:	Jenesis Development, LLC		
Project Number:	11219347	Created By:	cra\cmbarton	SIM OPS? YES/NO	SSE on site? YES/NO
Project Address:	1130 Niagara Street Buffalo				
Key Equipment:	Modified Class D Personal Protective Equipment, Field notebook, Pen/Pencil, Paper, Camera, Hand Sanitizer				
Task-specific Training:	Introduction to the CRA SMART Program, CRA Annual Safety Training, HAZCOM/WHMIS, HAZWOPER				

Hard Hat	Gloves (ANSI/EN 388)	Eye Protection	Fall Protection	APR	Vest	PPE Clothing
☐ Type 1 (Top Impact)	☐ Chemical Protective (ie.Nitrile)	☒ ANSI/CSA Safety Glasses	☐ Harness	☐ Full Face Mask	☒ Class II (standard)	☐ Coveralls
☐ Type 2 (Side Impact)	☒ Level 1 - Light Duty	☐ Goggles/Spoggles	☐ Shock Absorbing Lanyard	☐ Half Face Mask	☐ Class III (Night or Highway Traffic)	☐ Fire Retardent Clothing (FRC)
☒ Class E (standard)	☐ Level 2 - Light Duty with Protection	☐ Face Shields	☐ Lifeline		☐ Anti-Static	☒ High Viz Clothing
☐ Class G	☐ Level 3 - Medium Duty	☐ Other*		Cartridges	☐ FRC	☒ Long Pants
	☐ Level 4 - Heavy Duty			☐ N95	☐ PFD	☐ Long Sleeve Shirts
Foot Protection	☐ High Viz	Hearing Protection	Arc Flash/Shock Protection	☐ P100		☐ Paper Tyvek (disposable)
☒ Industrial Grade Safety Boot	☐ Other*	☐ NOT Required for this task	☐ Hazard Category 2	☐ P95		☐ Polyethylene Tyvek
☐ Rubber Boots (industrial grade)		☒ Required	☐ Hazard Category 4	☐ R95		☐ Other*

Hard Hat	Gloves (ANSI/EN 388)	Eye Protection	Fall Protection	APR	Vest	PPE Clothing
☐ Hip Waders				☐ Organic Vapour		
	* see key equipment			☐ Speciality*		

Project Development Team		Modified by	Reviewed by	Date
Name	Signature			
Katherine (kathy) Galanti				

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible (Print first and last names)
1	Review STAR and SWA	• Personnel not aware of STAR and SWA • Traffic hazards, unfamiliar locations	• Reminder of importance of and documentation procedures for SWA; use SWA to stop any unsafe or illegal work practices • Discuss inspection activities with construction site supervisor and appropriate subcontractors • Sign in with general contractor • Review CRA's and contractors site-specific HASP/orientation • Take time to map quest/plot route to and from site. Drive defensively, allow plenty of time for unforeseen traffic conditions	Inspector
2	Traversing the site, construction oversight	• Slip/trip hazards • Falling debris and materials • Heavy equipment (dozers, excavator, etc.) • Heat/Cold stress	• Spot check to identify hazards, establish pathways which is most free of slip and trip hazards, beware of trip hazards, keep work areas free of clutter, communicate hazards to on site personnel, • Be aware of your surroundings at all times; know where the heavy equipment is at all times while walking the site • Stay clear of heavy equipment swing radius (excavator) • Make eye contact with heavy equipment operators • Look for and obey all commands from flagmen • Look for loose debris • Always yield right of way to workers carrying materials • Do not cross barrier tape • Take frequent water breaks to stay hydrated. Adhere to GHD's H&S guidelines on heat/cold stress	Inspection
3	General activities	• Distractions • Slip/trip/fall hazards (see step 2) • Entanglement	• Do not answer or make calls from your cell phone; let your cell phone take a message • When talking to a contractor or other worker; stop walking; find a place to talk where you do not interfere with ongoing construction activities • Spot check to identify hazards, establish pathway which is most free of slip and trip hazards, beware of trip hazards, keep work areas free of clutter, communicate hazards to on site personnel • Wear appropriate clothing (no loose fitting clothing, tuck in draw strings, shoes/boots tied appropriately, sleeved shirts, long pants, etc.) • Never put your hand into a void or wall space • Do not wear a "hoody" under your hard hat as it may obstruct your peripheral vision	Inspectors

1. Each Job or Task consists of a set of steps. Be sure to list all the steps in the sequence that they are performed. Specify the equipment or other details to set the basis for the potential (associated) hazards.
2. A hazard is a potential danger. What can go wrong? How can someone get hurt? Consider, but do not limit, the analysis to: **Contact** - victim is struck by or strikes an object; **Caught** - victim is caught on, caught in or caught between objects; **Fall** - victim falls to ground or lower level (includes slips and trips); **Exertion** - excessive strain or stress/ergonomics/lifting techniques; **Exposure** - inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught".
3. Aligning with the Job Steps, Task Activity Description, and Potential Hazard columns, describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "be careful" or "use as appropriate".

Site Personnel Participating in JSA Review:

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Name/Company	Sign	Date

**SSE(s) on job:** _____**Assigned mentor:** _____

Presenter Signature: _____

Date/Time: _____

My signature below indicates that all conditions and requirements listed above have been verified, met, and reviewed with all affected personnel prior to start of work.

Supervisor Signature: _____

Date/Time: _____

Location of Mustering Point: _____

Wind direction (current): _____

GHD Emergency contact (Name and verified phone number): _____

Supervisor Signature documenting Daily Debrief has been completed: _____



Job Safety Analysis (JSA)

Mobile Equipment - General

Field staff must review job-specific work plan and coordinate with project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each workday. **Stop, Think, Act, Review (STAR)** must be used prior to any activity. All personnel must possess the appropriate training prior to initiating scheduled tasks. Also consider weather conditions. GHD personnel have the authority and responsibility to use **Stop Work Authority (SWA)**.

Date issued/revised:	[09/29/21]	Client:	[Genesis Development. LLC]			
Project number:	[11219347]	Created by	[Christine Barton]	Sim OPS	Yes/No	SSE on site? Yes/No
Project address:	[1130 Niagara Street Buffalo, NY]					
Specific task	[Moving and operating mobile/heavy equipment]					
Key equipment:	[Hydraulic excavator; bulldozer; skid steer; protective gloves; protective hard toe type logging boots; properly fitted clothing]					
Task-specific training:	[Equipment specific training]					

Hard hat	Gloves (ANSI/EN 388)	Eye protections	Fall protection	APR	Vest	PPE clothing
☐ Type I (top impact)	☐ Chemical protective (i.e. nitrile)	☒ ANSI/CSA safety glasses	☐ Harness	☐ Full face mask	☒ Class II	☐ Coveralls
☐ Type II (side impact)	☒ Level 1 light duty	☐ Goggles/spoggles	☐ Shock absorb lanyard	☐ Half face mask	☐ Class III	☐ Fire retardant clothing (FRC)
☒ Class E (standard)	☒ Level 2 light duty with protection	☐ Face shield	☐ Lifeline		☐ Anti-static	☐ High viz clothing
☐ Class G	☐ Level 3 medium duty	☐ Other*		Cartridges	☐ FRC	☐ Long pants
	☐ Level 4 heavy duty			☐ N95		☐ Long sleeve shirts
Foot protection	☐ High viz	Hearing protection	Arc flash	☐ P100		☐ Paper tyvek
☒ Industrial grade safety boot	☐ Other*	☐ NOT Required	☐ Haz.cat 2	☐ P95		☐ Polyethylene tyvek
☐ Rubber boots (industrial grade)		☒ Required	☐ Haz cat 4	☐ R95		☐ Other *
☐ Hip waders				☐ Organic vapor		
	see key equipment			☐ Specialty/other		

Project development team		Modified by	Reviewed by	Date
Name	Signature			
Christine Barton				

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾ Include energy sources from hazard wheel -	Corrective measure(s) ⁽³⁾	Person responsible (Print first and last names)	Verified by (Print first and last names)
1	Perform STAR process; refer to the mobile/heavy equipment manufacturer's operators manual before operating equipment.	- Slip/trip/fall hazards - Situational risks - Short service employees	- Verify personnel training is sufficient for scheduled task(s) - Is Job Instruction Training (hands on) training necessary? - Employees should remove finger rings, necklaces, or jewelry which may be hazardous in equipment operation		
2a	Perform daily (pre-shift) equipment inspection include area around the equipment and PPE and perform a complete walk around inspection	- Equipment failure - PPE failure	- Don all necessary PPE - Provide training to personnel on inspection procedures - Document daily inspection - Defects must be corrected before operating unit		
2b	Mount/dismount the equipment (Note: The most common cause of injury for equipment operators is slipping/falling while mounting/ dismounting the machine. Never jump from the machine.)	- Slip/trip/fall hazards - Sprains - Strains	- Use three points of contact - Clear tracks and personnel access points of debris and mud as necessary - Only a trained operator will be allowed on equipment - Never carry riders unless unit is so designed		
3a	Starting heavy/mobile equipment (Note: All operators manuals should be available for each piece of equipment and used in employee training)	- Struck-by - Caught between - Equipment failure	- Perform inspection (see Task 2) - Check to be certain all workers and equipment are a safe distance from unit - Allow proper warm up and wait for gauges to register properly - Raise the blade, cable and chokers, boom, grapple, or other attachments before moving the unit		

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾ Include energy sources from hazard wheel -	Corrective measure(s) ⁽³⁾	Person responsible (Print first and last names)	Verified by (Print first and last names)
3b	Operation of heavy/mobile equipment	• Struck-by • Caught between • Overhead/underground utilities • Flying debris • Rollover • Fire • Improper housekeeping • Winch failure	• Appropriate guarding (according to machine type and use) shall be in place at all times unit is in operation • Backup alarms shall be functional • Seat belts shall be provided and their use enforced • Fire extinguishers and first aid kits shall be provided on each unit • Fire extinguishers shall be inspected for functionality on a daily basis • Do not overload winch		
4a	Perform equipment maintenance	• Equipment failure/loss • Sharp objects • Pinch points	• Use STAR process • Follow equipment manufacturer's preventive maintenance procedures and instructions • Only qualified individuals should perform maintenance activities on equipment		
4b	Cleaning and housekeeping of equipment	• Fire • Slip/trip/fall hazards • Equipment failure	• Remove loose items from operator's compartment • At least once per day remove trash from equipment • Clean equipment as necessary to prevent buildup of debris, wood chips, etc. that may cause fire		

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- (2) A hazard is a potential danger. What can go wrong? How can someone get hurt? Consider, but do not limit, the analysis to: **Contact** - victim is struck by or strikes an object; **Caught** - victim is caught on, caught in or caught between objects; **Fall** - victim falls to ground or lower level (includes slips and trips); **Exertion** - excessive strain or stress/ergonomics/lifting techniques; **Exposure** - inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught".
- (3) Aligning with the Job Steps, Task Activity Description, and Potential Hazard columns, describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "be careful" or "use as appropriate".

Site personnel participating in JSA review:

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Name/Company	Sign	Date
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SSE(s) on job: _____ **Assigned mentor:** _____

Presenter signature: _____ Date/time: _____

My signature below indicates that all conditions and requirements listed above have been verified, met, and reviewed with all affected personnel prior to start of work.

Supervisor signature: _____ Date/time: _____

Location of mustering point: _____ Wind direction (current): _____

GHD emergency contact (Name and verified phone number): _____

Supervisor signature documenting daily debrief has been completed: _____





Job Safety Analysis (JSA)

Construction Oversight

Field staff must review job-specific work plan and coordinate with project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each workday. **Stop, Think, Act, Review (STAR)** must be used prior to any activity. All personnel must possess the appropriate training prior to initiating scheduled tasks. Also consider weather conditions. GHD personnel have the authority and responsibility to use **Stop Work Authority (SWA)**.

Date issued/revised:	09/29/21	Client:	Jenesis Development, LLC		
Project number:	11219347	Created by	Christine Barton		SSE on site? Yes/No
Project address:	1130 Niagara Street Buffalo, NY				
Specific task	Oversight of subcontractor construction activities				
Key equipment:	Clipboard, pen/paper, camera; hearing protection to be used as needed for specific tasks (when exceed 85 dB)				
Task-specific training:	Heavy/Mobile Equipment Safety, PPE				

Hard hat	Gloves (ANSI/EN 388)	Eye protections	Fall protection	APR	Vest	PPE clothing
☐ Type I (top impact)	☐ Chemical protective (i.e. nitrile)	☒ ANSI/CSA safety glasses	☐ Harness	☐ Full face mask	☒ Class II	☐ Coveralls
☐ Type II (side impact)	☒ Level 1 light duty	☐ Goggles/spoggles	☐ Shock absorb lanyard	☐ Half face mask	☐ Class III	☐ Fire retardant clothing (FRC)
☒ Class E (standard)	☐ Level 2 light duty with protection	☐ Face shield	☐ Lifeline		☐ Anti-static	☐ High viz clothing
☐ Class G	☐ Level 3 medium duty	☐ Other*		Cartridges	☐ FRC	☒ Long pants
	☐ Level 4 heavy duty			☐ N95		☐ Long sleeve shirts
Foot protection	☐ High viz	Hearing protection	Arc flash	☐ P100		☐ Paper tyvek
☒ Industrial grade safety boot	☐ Other*	☐ NOT Required	☐ Haz.cat 2	☐ P95		☐ Polyethylene tyvek
☐ Rubber boots (industrial grade)		☒ Required	☐ Haz cat 4	☐ R95		☐ Other *
☐ Hip waders				☐ Organic vapor		
	see key equipment			☐ Specialty/other		

Project development team		Modified by	Reviewed by	Date
Name	Signature			
Christine Barton			Wayne St. Denis	8/12/2016

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible
1	Review STAR and SWA	- Personnel not aware of STAR and SWA - Traffic hazards, unfamiliar locations	- Reminder of importance of and documentation procedures for SWA; use SWA to stop any unsafe or illegal work practices. - Discuss inspection activities with subcontractors' supervisor. - Conduct tailgate meeting. - Review GHDs and subcontractor site specific HASP/JSAs/orientation.	Site Supervisor
2	Traversing the site, accessing work area(s) (ladder/scaffold/stairs/climbing)	- Fall hazard (working at heights, floor openings, etc.) - Slip/trip/fall hazards - Falling debris and materials - Heavy equipment (cranes, dozers, excavator, etc.) - Blunt force trauma - Potential for death - Severe weather - Heat/cold stress	- Spot check to identify hazards, establish pathways free of slip/trip/fall hazards, beware of trip hazards, keep work areas free of clutter, communicate hazards to on-site personnel. - Ensure appropriate railings/guarding/delineations are in place around any temporarily open pits or that a spotter is in attendance. - Inspect ladder before use to ensure safe working condition. - Test ladder for stability and ensure it is tied off in safe manner. - Maintain three points of contact. - Ensure scaffold has been cleared for use before climbing (planks inspected, etc.). - Never climb scaffolding on the structure - always use the integral scaffold ladder or external ladder. - Adhere to GHD's Fall Protection Program - follow the most stringent fall protection requirements (proper protection systems) if no systems are in place, use your SWA. - In high winds do not go onto a roof. - Practice good housekeeping. - Wind is also amplified in high rise buildings when window installation is incomplete. - Watch where you step on pavement (potholes, dips, or obstructions) and in vegetated/wooded areas (dips, holes, branches, vines, etc.). - Maintain awareness of pedestrian/vehicular traffic. - Implement/follow work zone demarcation outlined in HASP to prevent unauthorized personnel and vehicles/equipment from entering the work zone. - Be aware of your surroundings at all times; know where the heavy equipment is at all times while walking the site.	Site Supervisor

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible
	Traversing the site, accessing work area(s) (ladder/scaffold/stairs/climbing) - Continued		- Stay clear of heavy equipment swing radius. - Make eye contact with heavy equipment operators. - Look for and obey all commands from flagmen. - Look ahead and plan your walking route in advance (snow, ice, or mud can cover up a multitude of hazardous items such as boards with nails and metal object). - Look for loose debris which may be resting on ceiling tiles or framing. - Stairs may have temporary railings; keep to the wall side of the steps. - Stairs may have tarps draped to keep the heat on a particular floor; listen for people on the other side before entering. - If worker is performing a task in the stair take another stair; do not try to walk around. - Always yield right of way to workers carrying materials. - Do not cross barrier tape without permission. - While on site, at first sign of lightning/thunder utilize SWA and assess weather conditions. If severe weather occurs, stop working; sit inside vehicle until storm passes. Wait 30 minutes after seeing the last lightning bolt or hearing the last thunder clap before continuing work. - In extreme temperatures, ensure all personnel have proper clothing, hydration, and heat/cold protection (e.g., canopy, fan, glove warmers). - Wear sunscreen, as required. - Follow heat/cold stress procedures in HASP.	
3	Inspection activities	- Working at heights - Slip/trip/fall hazards, (see Step 2)	- Carry a flashlight and cell phone or obtain a radio (as required). - Assess the risk versus benefit. - Is there any other way to observe what you need to observe? - Observe from location out of the way of workers? - Is it possible to take a picture instead? - Can worker use your camera to take a photo for you? - Look for and obey all commands from flagmen	Site Supervisor
4	General activities	- Distractions - Slip/trip/fall hazards (see Step 2) - Entanglement	- Do not answer or make calls from your cell phone; let your cell phone take a message. - When talking to a subcontractor or other worker; stop walking; find a place to talk where you don't interfere with ongoing construction activities. - Wear appropriate clothing (no loose fitting clothing, tuck in draw strings, boots tied appropriately, sleeved shirts, long pants, etc.). - Carry flashlight in your hand, not hanging from your hip. - Carry your camera in a pocket under sweater/coat/jacket, remove any strap from camera; ensure you secure it again once finished taking pictures. - Never put your hand into a void	Site Supervisor

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible
			- Do not wear a "hoody" under your hard hat as it may obstruct your peripheral vision. - Do not wear cell phone on your hip in a holster; place it in your shirt/sweater/coat pocket and remove any strap from cell phone.	

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- (3) Aligning with the Job Steps, Task Activity Description, and Potential Hazard columns, describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "be careful" or "use as appropriate".

Site personnel participating in JSA review:

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Name/Company	Sign	Date

SSE(s) on job: _____ Assigned mentor: _____

Presenter signature: _____ Date/time: _____

My signature below indicates that all conditions and requirements listed above have been verified, met, and reviewed with all affected personnel prior to start of work.

Supervisor signature: _____ Date/time: _____

Location of mustering point: _____ Wind direction (current): _____

GHD emergency contact (Name and verified phone number): _____

Supervisor signature documenting daily debrief has been completed: _____



Job Safety Analysis (JSA)

Driving/Mobilization/Demobilization

Field staff must review job-specific work plan and coordinate with project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each workday. **Stop, Think, Act, Review (STAR)** must be used prior to any activity. All personnel must possess the appropriate training prior to initiating scheduled tasks. Also consider weather conditions. GHD personnel have the authority and responsibility to use **Stop Work Authority (SWA)**.

Date issued/revised:	09/29/21	Client:	Genesis Development, LLC		
Project number:	11219347	Created by	Christine Barton		SSE on site? Yes/No
Project address:	1130 Niagara Street Buffalo, NY				
Specific task	Travel to/from site with company/rental/personal vehicles without trailers				
Key equipment:	Vehicle, valid driver's license, seatbelt				
Task-specific training:	Defensive Driving				

Hard hat	Gloves (ANSI/EN 388)	Eye protections	Fall protection	APR	Vest	PPE clothing
☐ Type I (top impact)	☐ Chemical protective (i.e. nitrile)	☐ ANSI/CSA safety glasses	☐ Harness	☐ Full face mask	☐ Class II	☐ Coveralls
☐ Type II (side impact)	☒ Level 1 light duty	☐ Goggles/spoggles	☐ Shock absorb lanyard	☐ Half face mask	☐ Class III	☐ Fire retardant clothing (FRC)
☐ Class E (standard)	☐ Level 2 light duty with protection	☐ Face shield	☐ Lifeline		☐ Anti-static	☐ High viz clothing
☐ Class G	☐ Level 3 medium duty	☐ Other*		Cartridges	☐ FRC	☐ Long pants
	☐ Level 4 heavy duty			☐ N95		☐ Long sleeve shirts
Foot protection	☐ High viz	Hearing protection	Arc flash	☐ P100		☐ Paper tyvek
☒ Industrial grade safety boot	☐ Other*	☐ NOT Required	☐ Haz.cat 2	☐ P95		☐ Polyethylene tyvek
☐ Rubber boots (industrial grade)		☐ Required	☐ Haz cat 4	☐ R95		☐ Other *
☐ Hip waders				☐ Organic vapor		
	see key equipment			☐ Specialty/other		

Project development team		Modified by	Reviewed by	Date
Name	Signature			
[Christine Barton]	[	[	[Wayne St. Denis]	[April 21, 2016]
[	[	[	[	[
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Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible
1	[Discuss STAR and SWA]	• [Site personnel not aware of STAR and SWA]	• [Project team (GHD) discusses importance of SWA during pre-job safety meeting. • Use SWA to stop any work that is unsafe.	[Driver and Passenger]
2	[Check weather]	• [Unexpected storm • Fog, rain, snow; lightening/thunder • Heat/cold stress	• [Check local weather forecast. • If adverse weather conditions are likely, prepare a contingency plan for lodging, etc. with project manager. • Discuss weather issues and precautions to take while driving and on site during the pre-job safety meeting. • If weather conditions (e.g., fog, rain, snow, etc.) impair the ability/vision of the driver, exit at nearest safe location and assess the situation. • While on site, at first sign of lightening/thunder utilize SWA and assess weather conditions. • In extreme temperatures, ensure all personnel have proper clothing, hydration, and heat/cold protection (e.g., canopy, fan, glove warmers). • Follow heat/cold stress procedures in HASP.	[Driver or Passenger]
3	[Load equipment into vehicle]	• [Lifting hazards • Manual material handling • Back injury • Cuts • Pinch points • Hand/foot injury • Forgotten or damaged equipment • Materials or equipment leaving the vehicle bed during travel create hazards for other drivers	• [Reduce travel distance when there is a need to carry/lift materials. • Make sure grip is adequate; wear leather/cotton gloves. • Maintain neutral wrist posture when lifting, carrying, pushing or pulling. The wrist is the strongest and most stable when it is straight. • Avoid one-handed carrying if possible; maintain awareness of footing. • Size up the load; if the object is too large or odd shaped OR is in excess of 50 pounds (23 kg) then assistance (mechanical or a buddy lift) will be required. • Maintain neutral back posture - lift with the legs (bend at the knees and use the leg muscles) to protect the lower back and make sure to shift with the feet rather than twisting at the back. • Avoid placing hands/fingers in pinch point locations. • Wear safety-toed boots and proper gloves. • Verify requested equipment against warehouse form. • Load equipment in an organized manner to prevent shifting during transport or use cargo netting. • Secure materials or equipment with cargo netting. Ensure netting does not loosen during travel by securing the straps with plastic wire ties or equivalent measures.	[Driver or Passenger]

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible
4	Complete GHD Daily Operator Vehicle Checklist	- Damaged vehicle lights, tires, windows, mirrors, horn - Inadequate vehicle documents and/or safety items	- Check for fluid leaks under vehicle. - Test operation of headlights, front/rear turn signals, backup lights, brake lights, and emergency flashers. - Visually check the pressure/wear of tires. - Ensure the vehicle has a spare tire. - Assure windshield and window glass is clean and free from obstructions. - Test the windshield wipers and horn. - Verify vehicle registration, insurance card, and inspection sticker is present and valid. - Ensure the vehicle contains a first aid kit, fire extinguisher, and road hazard kit. - Check immediate vehicle perimeter and initial path of travel for obstructions.	Driver or Passenger
5	Check and adjust seat, steering wheel, headrest, and mirrors	- Back/body strain - Blind spot - Impaired vision	- Adjust seat, headrest, and steering wheel height so body is fully supported/comfortable and pedals are within easy reach. - Ensure mirrors are properly adjusted.	Driver
6	Fasten seat belt(s) and ensure passenger(s) seat belts are fastened	Serious injury, ejection, or death from collision and/or traffic citation	Verify driver and passenger(s) seat belts are in good condition and properly latched.	Driver and Passenger
7	Ensure vehicle doors are locked	- Serious injury, ejection, or death from collision - Unwanted intrusion - Lost equipment	Manually lock all doors to vehicle.	Driver
8	Start engine and check gauges and warning lights	Vehicle breakdown	Verify sufficient fuel and other hazard lamps (e.g., battery, oil, and temperature) are not lit.	Driver
9	Driving/mobilizing to site - Use defensive driving techniques and stay alert	- Arriving late - Collision - Blind spots of other vehicles - Injury or death to occupants or other parties - Biological hazards	- Acknowledge and comply with all traffic regulations, laws, and ordinances. - Do not use two-way communicating devices or perform other distracting activities while vehicle is in motion. - Constantly scan intersections, move eyes, check mirrors, and assess traffic lights (fresh vs. stale). - Recognize other vehicle's blind spots and minimize time spent within these zones. - Maintain safety cushion around vehicle (front, sides, and rear) and 4-second following distance (add an extra second for each hazardous condition, triple following distance in poor weather conditions). - Signal well in advance before changing lanes or turning. - Utilize all driving defensive techniques. - Heightened awareness for deer in rural areas, especially at dusk and dawn.	Driver
10	Arrive at site	- Pedestrian injury - Collision	Maintain awareness of pedestrian/vehicular traffic when entering site and traveling to work zone.	Driver

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible
11	Park vehicle – assign a spotter if necessary (when in doubt use a spotter)	• Pedestrian injury • Collision • Property damage	• Maintain awareness of pedestrian/vehicular traffic. • Park vehicle in pull-through parking space or facing the exit. • Use caution and mirrors/spotter when backing vehicle. • Set parking brake.	Driver
12	Demobilization – also refer to Steps 3-11	• Collision • Injury or death to occupants or other parties	• Check immediate vehicle perimeter and initial path of travel for obstructions. • Maintain awareness of pedestrian/vehicular traffic when exiting site. • Utilize defensive driving techniques. • Complete post-departure checklist and report vehicle problems to company vehicle maintenance manager or rental car agency.	Driver

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- (2) A hazard is a potential danger. What can go wrong? How can someone get hurt? Consider, but do not limit, the analysis to: **Contact** - victim is struck by or strikes an object; **Caught** - victim is caught on, caught in or caught between objects; **Fall** - victim falls to ground or lower level (includes slips and trips); **Exertion** - excessive strain or stress/ergonomics/lifting techniques; **Exposure** - inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught".
- (3) Aligning with the Job Steps, Task Activity Description, and Potential Hazard columns, describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "be careful" or "use as appropriate".

Site personnel participating in JSA review:

I have participated in the review and discussion of the Job Safety Analysis (JSA) listed on this document and understand the duties I am responsible to fulfill. As part of my work, I know I have the responsibility and obligation to STOP work with a **Stop Work Authority (SWA)** if conditions change and/or potential hazards have been identified.

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SSE(s) on job: _____ Assigned mentor: _____

Presenter signature: _____ Date/time: _____

My signature below indicates that all conditions and requirements listed above have been verified, met, and reviewed with all affected personnel prior to start of work.

Supervisor signature: _____ Date/time: _____

Location of mustering point: _____ Wind direction (current): _____

GHD emergency contact (Name and verified phone number): _____

Supervisor signature documenting daily debrief has been completed: _____





Job Safety Analysis (JSA)

Insert Name : Environmental-
Decontamination of Sampling
Equipment and Personnel
(PPE Level D)

Field staff must review job specific work plan and coordinate with project manager to verify that all up front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each workday. **Stop, Think, Act, Review (STAR)** must be used prior to any activity. All personnel must possess the appropriate training prior to initiating scheduled tasks. Also consider weather conditions. GHD personnel have the authority and responsibility to use **Stop Work Authority (SWA)**. Review this JHA initially and in the field prior to initiating the job, using the P66 RM "Go Card" to assist in identifying specific site hazards. Document by "dirtying" this JHA.

Date Issued/Revised:	10/05/2021 18:16:09	Client:	Jenesis Development, LLC		
Project Number:	11219347	Created By:	cra/jmaurer	SIM OPS? YES/NO	SSE on site? YES/NO
Project Address:	1130 Niagara Street Buffalo				
Key Equipment:	Alconox/Liquinox, brushes				
Task-specific Training:	Decontamination/Site Control; Quality Control/Sampling Plan				

Hard Hat	Gloves (ANSI/EN 388)	Eye Protection	Fall Protection	APR	Vest	PPE Clothing
☐ Type 1 (Top Impact)	☒ Chemical Protective (ie.Nitrile)	☒ ANSI/CSA Safety Glasses	☐ Harness	☐ Full Face Mask	☒ Class II (standard)	☐ Coveralls
☐ Type 2 (Side Impact)	☐ Level 1 - Light Duty	☐ Goggles/Spoggles	☐ Shock Absorbing Lanyard	☐ Half Face Mask	☐ Class III (Night or Highway Traffic)	☐ Fire Retardent Clothing (FRC)
☒ Class E (standard)	☐ Level 2 - Light Duty with Protection	☐ Face Shields	☐ Lifeline		☐ Anti-Static	☐ High Viz Clothing
☐ Class G	☐ Level 3 - Medium Duty	☐ Other*		Cartridges	☐ FRC	☒ Long Pants
	☐ Level 4 - Heavy Duty			☐ N95	☐ PFD	☒ Long Sleeve Shirts
Foot Protection	☐ High Viz	Hearing Protection	Arc Flash/Shock Protection	☐ P100		☐ Paper Tyvek (disposable)

Hard Hat	Gloves (ANSI/EN 388)	Eye Protection	Fall Protection	APR	Vest	PPE Clothing
☒ Industrial Grade Safety Boot	☐ Other*	☒ NOT Required for this task	☐ Hazard Category 2	☐ P95		☐ Polyethylene Tyvek
☐ Rubber Boots (industrial grade)		☐ Required	☐ Hazard Category 4	☐ R95		☐ Other*
☐ Hip Waders				☐ Organic Vapour		
	* see key equipment			☐ Speciality*		

Project Development Team		Modified by	Reviewed by	Date
Name	Signature			
Katherine (kathy) Galanti				

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible (Print first and last names)
1	Decontamination of sampling equipment (including pumps, bailers, tubing, etc.)	- Contaminant exposure - Pinch points - Slip/trip/hit/fall hazards - Lifting hazards - Back injury - Manual material handling	- Set up decon station to capture any spills to avoid cross contamination and manage wastes - Wear appropriate PPE - Scrub equipment clean then rinse and verify it is clean and free of contamination - Avoid putting hands in or near pinch points - Maintain good housekeeping and be aware of surroundings - Size up the load; if the object is too large or odd shaped OR is in excess of 50 pounds (23 kg) then assistance (mechanical means, such as a dolly, cart, or a buddy lift) will be required - Lift with the legs (bend at the knees and use the leg muscles) to protect the lower back and keep lower back in a neutral position - Refer to the HASP for additional lifting techniques	Sampling Personnel
2	Decontamination of personnel	- Contaminant exposure - Slip/trip/hit/fall hazards	- Refer to the HASP for specific procedures but in general start with most contaminated article and remove until inner gloves are the last item left - Dispose of used PPE in accordance with site requirements - Wash hands and face before eating, drinking, or using tobacco products - Take care when removing PPE (boots, gloves, etc.); sit down to remove/change boots as necessary	Sampling personnel
3	Management of waste derived from decontamination activities	- Contaminant exposure - Lifting hazards - Back injury - Manual material handling	- Containerize decon waste (e.g., water, used PPE) as required - Properly dispose of decon fluids (e.g., sediments) - Refer to step 1 and the HASP for additional lifting information	Sampling personnel

- Each Job or Task consists of a set of steps. Be sure to list all the steps in the sequence that they are performed. Specify the equipment or other details to set the basis for the potential (associated) hazards.
- A hazard is a potential danger. What can go wrong? How can someone get hurt? Consider, but do not limit, the analysis to: **Contact** - victim is struck by or strikes an object; **Caught** - victim is caught on, caught in or caught between objects; **Fall** - victim falls to ground or lower level (includes slips and trips); **Exertion** - excessive strain or stress/ergonomics/lifting techniques; **Exposure** - inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught".
- Aligning with the Job Steps, Task Activity Description, and Potential Hazard columns, describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "be careful" or "use as appropriate".

Site Personnel Participating in JSA Review:

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Name/Company	Sign	Date

**SSE(s) on job:** _____**Assigned mentor:** _____

Presenter Signature: _____

Date/Time: _____

My signature below indicates that all conditions and requirements listed above have been verified, met, and reviewed with all affected personnel prior to start of work.

Supervisor Signature: _____

Date/Time: _____

Location of Mustering Point: _____

Wind direction (current): _____

GHD Emergency contact (Name and verified phone number): _____

Supervisor Signature documenting Daily Debrief has been completed: _____



Job Safety Analysis (JSA)

Insert Name : Environmental-Soil Sampling

Field staff must review job specific work plan and coordinate with project manager to verify that all up front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each workday. **Stop, Think, Act, Review (STAR)** must be used prior to any activity. All personnel must possess the appropriate training prior to initiating scheduled tasks. Also consider weather conditions. GHD personnel have the authority and responsibility to use **Stop Work Authority (SWA)**. Review this JHA initially and in the field prior to initiating the job, using the P66 RM "Go Card" to assist in identifying specific site hazards. Document by "dirtying" this JHA.

Date Issued/Revised:	01/20/2022 14:59:24	Client:	Jenesis Development, LLC		
Project Number:	11219347	Created By:	cra\cmbarton	SIM OPS? YES/NO	SSE on site? YES/NO
Project Address:	1130 Niagara Street Buffalo				
Key Equipment:	Air monitoring equipment, PPE Additional PPE: Tyvek if Level C initiated; gloves dependent on the task and chemical contamination present or suspected present				
Task-specific Training:	GHD Field Method Training on Soil Sampling Procedures				

Hard Hat	Gloves (ANSI/EN 388)	Eye Protection	Fall Protection	APR	Vest	PPE Clothing
☐ Type 1 (Top Impact)	☐ Chemical Protective (ie.Nitrile)	☒ ANSI/CSA Safety Glasses	☐ Harness	☐ Full Face Mask	☒ Class II (standard)	☐ Coveralls
☐ Type 2 (Side Impact)	☒ Level 1 - Light Duty	☐ Goggles/Spoggles	☐ Shock Absorbing Lanyard	☐ Half Face Mask	☐ Class III (Night or Highway Traffic)	☐ Fire Retardent Clothing (FRC)
☒ Class E (standard)	☐ Level 2 - Light Duty with Protection	☐ Face Shields	☐ Lifeline		☐ Anti-Static	☐ High Viz Clothing
☐ Class G	☐ Level 3 - Medium Duty	☐ Other*		Cartridges	☐ FRC	☐ Long Pants
	☐ Level 4 - Heavy Duty			☐ N95	☐ PFD	☐ Long Sleeve Shirts
Foot Protection	☐ High Viz	Hearing Protection	Arc Flash/Shock Protection	☐ P100		☐ Paper Tyvek (disposable)
☒ Industrial Grade Safety Boot	☐ Other*	☒ NOT Required for this task	☐ Hazard Category 2	☐ P95		☐ Polyethylene Tyvek

Hard Hat	Gloves (ANSI/EN 388)	Eye Protection	Fall Protection	APR	Vest	PPE Clothing
☐ Rubber Boots (industrial grade)		☐ Required	☐ Hazard Category 4	☐ R95		☐ Other*
☐ Hip Waders				☐ Organic Vapour		
	* see key equipment			☐ Speciality*		

Project Development Team		Modified by	Reviewed by	Date
Name	Signature			
Katherine (kathy) Galanti				

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible (Print first and last names)
1	Discuss STAR and SWA	Site personnel not aware of STAR and SWA	- Project team (GHD) discusses importance of and documentation procedures for SWA during pre job safety meeting - Use SWA to stop any work that is unsafe	Site Personnel
2	Inspect and calibrate sampling and monitoring equipment	- Lost time from improperly functioning equipment - Incorrect sampling procedures/ collection due to malfunctioning equipment	- Ensure all equipment is functioning properly - Complete Quality Control documents	Sampling Technician
3	Prepare to collect soil samples	- Lifting hazards - Back injury - Manual material handling - Pinch points - Cuts - Punctures - Sample misidentification	- Size up the load; if the object is too large or odd shaped OR is in excess of 50 pounds (23 kg) then assistance (mechanical or a buddy lift) will be required - Lift with the legs (bend at the knees and use the leg muscles) to protect the lower back and keep lower back in a neutral position - Avoid one handed carrying if possible; maintain awareness of footing - No bending or twisting while under load - Refer to the HASP for additional lifting information - Avoid placing hands/fingers in pinch point locations - Use proper tools when opening container packaging - Do not use fixed open blade knives when opening boxes or containers - Ensure the sample id label matches sample location with site plan/GHD site supervisor/subcontractor	Sampling Technician
4	Opening the sample sleeve (if applicable)	- Cuts due to sharp edges of sample sleeve - Contaminant exposure	- Use sleeve cutter for opening the sample sleeves - Keep hands clear of the sleeve when cutting - Wear nitrile gloves - Maintain awareness of sharp edges of sample sleeve	Sampling Technician
5	Sample collection	- Contaminant exposure - Cuts from container breakage - Sample misidentification	- Wear nitrile gloves and replace between soil samples - Inspect glass bottles for breaks/cracks - Do not attempt to use any suspect containers - Close glass sample containers carefully to avoid breakage - Check sample labels for accuracy prior to placing in cooler	Sampling Technician
6	Headspace screening of samples	- Contaminant exposure - Incorrect headspace readings	- Wear nitrile gloves - Ensure proper calibration of equipment	Sampling Technician
7	Sample selection	- Bottle breakage - Contaminant exposure - Pinch points - Lost time due to incorrect sample selection	- Wear nitrile gloves when handling sample containers - Confirm selected samples are correct based on work plan selection criteria, PID readings, and soil boring logs - Avoid placing hands/fingers in pinch point locations (e.g., between cooler and lid)	Sampling Technician

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible (Print first and last names)
8	Packing samples in cooler(s)	● Bottle breakage ● Contaminant exposure ● Cuts ● Pinch points ● Lifting hazards ● Back injury ● Manual material handling ● Lost time due to incorrect sample packaging or hold time exceedances	● Wear nitrile gloves when handling sample containers ● Pack glass containers in bubble wrap ● Check COC against sample labels and SSOW for accuracy before shipping ● Avoid placing hands/fingers in pinch point locations (e.g., between cooler and lid) ● Use proper lifting techniques as discussed in step 3 ● If possible use a dolly or cart if cooler is heavy or has to be moved over a long distance ● Ensure equipment and supplies are loaded correctly and do not shift during transport	Sampling Technician
9	Investigation derived waste (IDW) management	● Contaminant exposure ● Lifting hazards ● Back injury ● Manual material handling ● Pinch points ● Slips/trips/fall hazards ● Mislabeled waste	● Wear nitrile gloves when handling IDW ● Use proper lifting techniques as discussed in step 3 ● Avoid placing hands/fingers in pinch point locations ● Maintain awareness of walking surfaces ● Label IDW with generator, a contact number, identification of contents, and site location ● Specify IDW as either hazardous or non hazardous material	Sampling Technician

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Name/Company	Sign	Date

**SSE(s) on job:** _____**Assigned mentor:** _____

Presenter Signature: _____

Date/Time: _____

My signature below indicates that all conditions and requirements listed above have been verified, met, and reviewed with all affected personnel prior to start of work.

Supervisor Signature: _____

Date/Time: _____

Location of Mustering Point: _____

Wind direction (current): _____

GHD Emergency contact (Name and verified phone number): _____

Supervisor Signature documenting Daily Debrief has been completed: _____



Job Safety Analysis (JSA)

Insert Name : Environmental-Drum
Sampling for Non Hazardous
Material

Field staff must review job specific work plan and coordinate with project manager to verify that all up front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each workday. **Stop, Think, Act, Review (STAR)** must be used prior to any activity. All personnel must possess the appropriate training prior to initiating scheduled tasks. Also consider weather conditions. GHD personnel have the authority and responsibility to use **Stop Work Authority (SWA)**. Review this JHA initially and in the field prior to initiating the job, using the P66 RM "Go Card" to assist in identifying specific site hazards. Document by "dirtying" this JHA.

Date Issued/Revised:	01/20/2022 14:59:25	Client:	Jenesis Development, LLC		
Project Number:	11219347	Created By:	cra\cmbarton	SIM OPS? YES/NO	SSE on site? YES/NO
Project Address:	1130 Niagara Street Buffalo				
Key Equipment:					
Task-specific Training:	Hand Tools; Air Monitoring; RCRA/DOT Awareness Training				

Hard Hat	Gloves (ANSI/EN 388)	Eye Protection	Fall Protection	APR	Vest	PPE Clothing
☐ Type 1 (Top Impact)	☐ Chemical Protective (ie.Nitrile)	☒ ANSI/CSA Safety Glasses	☐ Harness	☐ Full Face Mask	☒ Class II (standard)	☐ Coveralls
☐ Type 2 (Side Impact)	☒ Level 1 - Light Duty	☐ Goggles/Spoggles	☐ Shock Absorbing Lanyard	☐ Half Face Mask	☐ Class III (Night or Highway Traffic)	☐ Fire Retardent Clothing (FRC)
☒ Class E (standard)	☐ Level 2 - Light Duty with Protection	☐ Face Shields	☐ Lifeline		☐ Anti-Static	☐ High Viz Clothing
☐ Class G	☐ Level 3 - Medium Duty	☐ Other*		Cartridges	☐ FRC	☐ Long Pants
	☐ Level 4 - Heavy Duty			☐ N95	☐ PFD	☐ Long Sleeve Shirts
Foot Protection	☐ High Viz	Hearing Protection	Arc Flash/Shock Protection	☐ P100		☐ Paper Tyvek (disposable)
☒ Industrial Grade Safety Boot	☐ Other*	☐ NOT Required for this task	☐ Hazard Category 2	☐ P95		☐ Polyethylene Tyvek
☐ Rubber Boots (industrial grade)		☐ Required	☐ Hazard Category 4	☐ R95		☐ Other*

Hard Hat	Gloves (ANSI/EN 388)	Eye Protection	Fall Protection	APR	Vest	PPE Clothing
☐ Hip Waders				☐ Organic Vapour		
	* see key equipment			☐ Speciality*		

Project Development Team		Modified by	Reviewed by	Date
Name	Signature			
Katherine (kathy) Galanti				

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible (Print first and last names)
1	Discuss STAR and SWA	Site personnel not aware of stop work authority	- Project team (GHD) discuss importance of and document procedures for SWA during pre job safety meeting - Use SWA to stop any work that does not comply with the GHD or Client policies	
2	Tailgate Safety Meeting/Safe Performance Self Assessment (SPSA)	- Not identifying all hazards - Property damage - Injury	- Discuss work to be performed and associated hazards - Open communication among team members; have all team members sign safety meeting form - Discuss any new or unknown hazards; Include discussion on SWA, hospital route, evacuation procedures, emergency contact(s), etc. - Identify personnel responsible for respective JSA critical actions for job steps	
3	Opening drums	- Cuts - Hand injury - Pinch point	- Wear leather/cotton gloves and use proper tool (e.g., box end wrench or socket wrench) - Avoid placing hands/fingers in pinch point locations	
4	Sample collection	- Contaminant exposure - Cuts from container breakage - Sample misidentification	- Wear nitrile gloves while collecting soil sample - Inspect container for breaks/cracks - Do not attempt to use any suspect containers - Close containers carefully to avoid breakage - Check sample labels for accuracy prior to placing in cooler	
5	Sample packing	Bottle breakage Contaminant exposure Cuts Pinch points Lifting hazards - Back injury - Manual material handling - Lost time due to incorrect sample packaging or hold time exceedances	- Wear nitrile gloves when handling sample containers - Pack glass containers in bubble wrap - Check COC against sample labels and SSOW for accuracy before shipping - Avoid placing hands/fingers in pinch point locations (e.g., between cooler and lid) - Lift with the legs (bend at the knees and use the leg muscles) to protect the lower back - If the object is in excess of 50 pounds (23 kg) then assistance (mechanical such as a cart, dolly or a buddy lift) will be required - Make sure grip is adequate; use gloves to enhance grip when necessary - Reduce distance needed to travel when handling materials - Ensure equipment and supplies are loaded correctly and do not shift during transport	
6	Closing drums	- Cuts - Hand injury - Pinch point	- Wear leather/cotton gloves and use proper tool (e.g., box end wrench or socket wrench) - Avoid placing hands/fingers in pinch point locations	

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2. A hazard is a potential danger. What can go wrong? How can someone get hurt? Consider, but do not limit, the analysis to: **Contact** - victim is struck by or strikes an object; **Caught** - victim is caught on, caught in or caught between objects; **Fall** - victim falls to ground or lower level (includes slips and trips); **Exertion** - excessive strain or stress/ergonomics/lifting techniques; **Exposure** - inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught".
3. Aligning with the Job Steps, Task Activity Description, and Potential Hazard columns, describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "be careful" or "use as appropriate".

Site Personnel Participating in JSA Review:

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Name/Company	Sign	Date

**SSE(s) on job:** _____**Assigned mentor:** _____

Presenter Signature: _____

Date/Time: _____

My signature below indicates that all conditions and requirements listed above have been verified, met, and reviewed with all affected personnel prior to start of work.

Supervisor Signature: _____

Date/Time: _____

Location of Mustering Point: _____

Wind direction (current): _____

GHD Emergency contact (Name and verified phone number): _____

Supervisor Signature documenting Daily Debrief has been completed: _____



Job Safety Analysis (JSA)

Insert Name : Remediation-Derived Waste
Drum Moving and Handling

Field staff must review job specific work plan and coordinate with project manager to verify that all up front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each workday. **Stop, Think, Act, Review (STAR)** must be used prior to any activity. All personnel must possess the appropriate training prior to initiating scheduled tasks. Also consider weather conditions. GHD personnel have the authority and responsibility to use **Stop Work Authority (SWA)**. Review this JHA initially and in the field prior to initiating the job, using the P66 RM "Go Card" to assist in identifying specific site hazards. Document by "dirtying" this JHA.

Date Issued/Revised:	01/20/2022 14:59:26	Client:	Jenesis Development, LLC		
Project Number:	11219347	Created By:	cra\cmbarton	SIM OPS? YES/NO	SSE on site? YES/NO
Project Address:	1130 Niagara Street Buffalo				
Key Equipment:	Empty drums, spill kit, dolly, ratchet set, or box end wrench for loosening and tightening drum band, bung cap tool				
Task-specific Training:	40 Hour HAZWOPER or 8 Hour Refresher, HAZComm, PPE, Hand and Power Tools				

Hard Hat	Gloves (ANSI/EN 388)	Eye Protection	Fall Protection	APR	Vest	PPE Clothing
☐ Type 1 (Top Impact)	☐ Chemical Protective (ie.Nitrile)	☒ ANSI/CSA Safety Glasses	☐ Harness	☐ Full Face Mask	☒ Class II (standard)	☐ Coveralls
☐ Type 2 (Side Impact)	☒ Level 1 - Light Duty	☐ Goggles/Spoggles	☐ Shock Absorbing Lanyard	☐ Half Face Mask	☐ Class III (Night or Highway Traffic)	☐ Fire Retardent Clothing (FRC)
☐ Class E (standard)	☐ Level 2 - Light Duty with Protection	☐ Face Shields	☐ Lifeline		☐ Anti-Static	☐ High Viz Clothing
☐ Class G	☐ Level 3 - Medium Duty	☐ Other*		Cartridges	☐ FRC	☐ Long Pants
	☐ Level 4 - Heavy Duty			☐ N95	☐ PFD	☐ Long Sleeve Shirts
Foot Protection	☐ High Viz	Hearing Protection	Arc Flash/Shock Protection	☐ P100		☐ Paper Tyvek (disposable)
☒ Industrial Grade Safety Boot	☐ Other*	☒ NOT Required for this task	☐ Hazard Category 2	☐ P95		☐ Polyethylene Tyvek

Hard Hat	Gloves (ANSI/EN 388)	Eye Protection	Fall Protection	APR	Vest	PPE Clothing
☐ Rubber Boots (industrial grade)		☐ Required	☐ Hazard Category 4	☐ R95		☐ Other*
☐ Hip Waders				☐ Organic Vapour		
	* see key equipment			☐ Speciality*		

Project Development Team		Modified by	Reviewed by	Date
Name	Signature			
Katherine (kathy) Galanti				

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible (Print first and last names)
1	Walk the path to and from the drum storage area	Slip/trip/fall hazards	- Review HASP and client requirements and implement - Use the STAR process to identify and correct any obvious hazards - Remove trip hazards in the area around the drums before moving hazards	
2	Set up staging area	- Slip/trip/fall hazards - Traffic hazards - Spills	- Remove trip hazards in the area around the drums before moving hazards - Select and demarcate area if necessary to prevent unauthorized personnel and vehicle entry - Ensure emergency spill materials are readily available	
3	Inspect all equipment and hand tools before use	- Hand injuries - Back Injuries - Lacerations	- Inspect dolly to ensure that it is operating properly (wheels turning freely, proper air pressure in wheels, no cracks in welds, sharp edges or burrs) - Select and inspect ratchet and socket or box end wrench - Do not use adjustable wrench or screw driver to loosen or tighten band - Ensure bung caps on drums are in place and secure if provided	
4	Remove drum lid	- Contaminant exposure - Pinch points - Hand injury	- Select and inspect ratchet and socket or box end wrench - Do not use adjustable wrench or screw driver to loosen or tighten band - Wear appropriate gloves as identified in PPE section	
5	Fill drum to appropriate level with derived waste material (i.e., soil cuttings, waste absorbent material, PPE Tyvek suits, etc.)	- Contaminant exposure - Pinch points - Hand injury - Lifting hazards	- Reduce risk of contaminant exposure by wearing proper PPE when handling waste materials (i.e., safety glasses, leather gloves, Tyvek suit, respirator, and appropriate gloves as identified in PPE section) - Lift with the legs (bend at the knees and use the leg muscles) to protect the lower back and keep lower back in a neutral position - If an object is too large or odd shaped OR is in excess of 50 pounds (23 kg) then assistance (mechanical or a buddy lift) will be required - Fill drums ONLY to 75% capacity with soil and 85% capacity with water. DO NOT fill drums to full capacity.	
6	Properly seal the drum prior to moving	- Contaminant exposure - Pinch points - Hand injury	- Select and inspect ratchet and socket or box end wrench - Do not use adjustable wrench or screw driver to loosen or tighten band - Wear appropriate gloves as identified in PPE section - Ensure band is placed and secured properly to prevent lid from opening	

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible (Print first and last names)
7	Attach drums to dolly and move filled containers to designated staging area.	● Pinch points ● Hand injury ● Slip/trip/fall hazards ● Lifting hazards ● Manual material handling ● Back injury	● Ensure that drums are sealed properly before maneuvering ● Reduce travel distance when there is a need to carry/lift materials ● Ensure that drum is properly fastened to dolly prior to moving ● Make sure grip is adequate; wear leather gloves ● Use moving/lifting device (drum dolly/forklift) to move 55 gallon drums; if an object is too large or odd shaped OR is in excess of 50 pounds (23 kg) then assistance (mechanical or buddy lift) is required ● Lift with the legs (bend at the knees and use the leg muscles) to protect the lower back and keep lower back in a neutral position ● Avoid one handed carrying if possible; maintain awareness of footing ● Place drum in drum storage/staging area in careful, controlled manner ● If available, place drums on pallet for easier loading and unloading ● Keep hands and feet out of pinch points and crush points	
8	Managing waste drums (55 gallon drums)	● Mislabeling waste	● Label waste appropriately (generator, contact number, identification of contents, and site location); specify type of contents; arrange for disposal	

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2. A hazard is a potential danger. What can go wrong? How can someone get hurt? Consider, but do not limit, the analysis to: **Contact** - victim is struck by or strikes an object; **Caught** - victim is caught on, caught in or caught between objects; **Fall** - victim falls to ground or lower level (includes slips and trips); **Exertion** - excessive strain or stress/ergonomics/lifting techniques; **Exposure** - inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught".
3. Aligning with the Job Steps, Task Activity Description, and Potential Hazard columns, describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "be careful" or "use as appropriate".

Site Personnel Participating in JSA Review:

I have participated in the review and discussion of the Job Safety Analysis (JSA) listed on this document and understand the duties I am responsible to fulfill. As part of my work, I know I have the responsibility and obligation to STOP work with a Stop Work Authority (SWA) if conditions change and/or potential hazards have been identified.

Name/Company	Sign	Date

**SSE(s) on job:** _____**Assigned mentor:** _____

Presenter Signature: _____

Date/Time: _____

My signature below indicates that all conditions and requirements listed above have been verified, met, and reviewed with all affected personnel prior to start of work.

Supervisor Signature: _____

Date/Time: _____

Location of Mustering Point: _____

Wind direction (current): _____

GHD Emergency contact (Name and verified phone number): _____

Supervisor Signature documenting Daily Debrief has been completed: _____



Job Safety Analysis (JSA)

Insert Name : Environmental-Plugging and Abandoning

Field staff must review job specific work plan and coordinate with project manager to verify that all up front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each workday. **Stop, Think, Act, Review (STAR)** must be used prior to any activity. All personnel must possess the appropriate training prior to initiating scheduled tasks. Also consider weather conditions. GHD personnel have the authority and responsibility to use **Stop Work Authority (SWA)**. Review this JHA initially and in the field prior to initiating the job, using the P66 RM "Go Card" to assist in identifying specific site hazards. Document by "dirtying" this JHA.

Date Issued/Revised:	01/20/2022 14:59:26	Client:	Jenesis Development, LLC		
Project Number:	11219347	Created By:	cra\cmbarton	SIM OPS? YES/NO	SSE on site? YES/NO
Project Address:	1130 Niagara Street Buffalo				
Key Equipment:	Safety cones/barricades; Geoprobe Additional PPE: Cease operations and re evaluate the scope of work or upgrade to Level C (full face respirator with OV carts, Tyvek, nitrile inner and outer gloves, safety rated rubber boots or overboots) if sustained background readings are 1 ppm or greater				
Task-specific Training:	HAZCOM, PPE, Heavy/Mobile Equipment Safety, Remember Charlie				

Hard Hat	Gloves (ANSI/EN 388)	Eye Protection	Fall Protection	APR	Vest	PPE Clothing
☐ Type 1 (Top Impact)	☐ Chemical Protective (ie.Nitrile)	☒ ANSI/CSA Safety Glasses	☐ Harness	☐ Full Face Mask	☒ Class II (standard)	☐ Coveralls
☐ Type 2 (Side Impact)	☒ Level 1 - Light Duty	☐ Goggles/Spoggles	☐ Shock Absorbing Lanyard	☐ Half Face Mask	☐ Class III (Night or Highway Traffic)	☐ Fire Retardent Clothing (FRC)
☒ Class E (standard)	☐ Level 2 - Light Duty with Protection	☐ Face Shields	☐ Lifeline		☐ Anti-Static	☐ High Viz Clothing
☐ Class G	☐ Level 3 - Medium Duty	☐ Other*		Cartridges	☐ FRC	☐ Long Pants
	☐ Level 4 - Heavy Duty			☐ N95	☐ PFD	☐ Long Sleeve Shirts
Foot Protection	☐ High Viz	Hearing Protection	Arc Flash/Shock Protection	☐ P100		☐ Paper Tyvek (disposable)

Hard Hat	Gloves (ANSI/EN 388)	Eye Protection	Fall Protection	APR	Vest	PPE Clothing
☒ Industrial Grade Safety Boot	☐ Other*	☐ NOT Required for this task	☐ Hazard Category 2	☐ P95		☐ Polyethylene Tyvek
☐ Rubber Boots (industrial grade)		☐ Required	☐ Hazard Category 4	☐ R95		☐ Other*
☐ Hip Waders				☐ Organic Vapour		
	* see key equipment			☐ Speciality*		

Project Development Team		Modified by	Reviewed by	Date
Name	Signature			
Katherine (kathy) Galanti				

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible (Print first and last names)
1	Discuss STAR and SWA	Site personnel not aware of STAR and SWA	- Project team (GHD) discusses importance of and documentation procedures for SWA during pre job safety meeting - Use SWA to stop any work that is unsafe	
2	Tailgate safety meeting	Not identifying all hazard	- Discuss work to be performed and associated hazards - Open communication among team members - Have all team members sign safety meeting form - Include discussion on SWA, hospital route, evacuation procedures, emergency contact(s), etc. - Identify personnel responsible for respective JSA critical actions for job steps	
3	Conduct site walk, identify unsafe conditions, and inspect well locations	- Traffic - Slip/trip/fall hazards - Biological and overhead hazards - Maintain awareness of on site traffic and walking surfaces - When inspecting well locations, be aware of biological hazards (e.g., ants, poison ivy, wasps) and overhead hazards (e.g., overhead utilities)	- Discuss work to be performed and associated hazards - Open communication among team members - Have all team members sign safety meeting form - Include discussion on SWA, hospital route, evacuation procedures, emergency contact(s), etc. - Identify personnel responsible for respective JSA critical actions for job steps	
4	Inspection of equipment	- Pinch points - Injury; property damage - Lost time due to damaged equipment/parts	- Discuss pinch points on equipment (e.g., Geoprobe, etc.) - Familiarize all personnel with location/operation of fire extinguisher(s) and kill switch on Geoprobe - Visually inspect equipment/parts for damage	
5	Setup of staging area and work zone	- Traffic - Slip/trip/fall hazards - Pinch points - Lifting hazards - Back injury - Manual material handling - Heat stress - Unstable ground conditions	- Maintain awareness of on site traffic and walking surfaces - Utilize barricades/cones/caution tape to define staging area and to direct traffic - Wear leather/cotton gloves when setting up barricades - Identify heavy loads (>50 lbs/23kg) or loads with shapes or weight distribution that makes them unwieldy - Use at least two people to lift and carry loads greater than 50 lbs - Bend and lift with legs and arms not back - Determine path of travel prior to lifting any object - Ensure all personnel have proper clothing, hydration, and heat/cold protection (e.g., canopy) - Inspect soil for loose, soft or unstable conditions under rig jacks or outriggers	

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible (Print first and last names)
6	Subcontractor oversight of removing well casing from ground surface	• Equipment failure • Hand injury • Lifting hazards • Back injury • Manual material handling • Slip/trip/fall hazards	• Perform periodic inspections of Geoprobe • Perform a pre-start meeting and inform the subcontractor of safe lifting practices (move objects with cart or dolly when possible) • Refer to step 5 and the HASP for additional lifting information • Ensure operators are wearing leather gloves and using proper body positioning • Practice good housekeeping techniques by keeping work zone free of tripping hazards • Maintain awareness of open borehole	
7	Subcontractor oversight of breaking and removing of concrete from monitor well pad	• Traffic • Slip/trip/fall hazards • Flying debris, property damage • Hearing loss • Cuts/scrapes • Lifting hazards • Back injury • Manual material handling	• Stay within designated work zones and maintain awareness of on site traffic and walking surfaces, use rig as shield • Keep workers/vehicles out of line of fire • Ensure all on site personnel are wearing hearing protection (ear plugs) when in the vicinity of the drill rig • Ensure subcontractors wear leather gloves while handling concrete and watch for rebar and sharp corners of concrete • Refer to step 5 and the HASP for additional lifting information	
8	Subcontractor oversight of surface completion	• Lifting hazards • Back injury • Manual material handling • Eye injury • Skin exposure to concrete • Particulate inhalation • Slip/trip/fall hazards	• Ensure subcontractors are using proper lifting techniques and equipment to mix concrete • Do not allow individual subcontractors to lift greater than 50 lbs • Subcontractors must wear nitrile gloves, dust mask, and safety glasses with side shields • Practice good housekeeping techniques by keeping work zone free of tripping hazards • Verify surface completions with concrete at grade to prevent a future tripping hazard • Leave barricades over former well locations until concrete is safe to drive on • Refer to step 5 and the HASP for additional lifting information	
9	Site cleanup and demobilization (see also job step 2)	• Slip/trip/fall hazards • Vapors and airborne particulates • Lowering mast	• Pick up tools, materials, equipment, and debris to prevent tripping hazards • Wear appropriate PPE including safety glasses, face shield (splash hazard), dust masks (if necessary), and pants • Stay upwind of vapors • Keep hands and other body parts clear of mast while lowering to avoid pinch points • Wear leather work gloves	

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2. A hazard is a potential danger. What can go wrong? How can someone get hurt? Consider, but do not limit, the analysis to: **Contact** - victim is struck by or strikes an object; **Caught** - victim is caught on, caught in or caught between objects; **Fall** - victim falls to ground or lower level (includes slips and trips); **Exertion** - excessive strain or stress/ergonomics/lifting techniques; **Exposure** - inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught".
3. Aligning with the Job Steps, Task Activity Description, and Potential Hazard columns, describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "be careful" or "use as appropriate".

Site Personnel Participating in JSA Review:

I have participated in the review and discussion of the Job Safety Analysis (JSA) listed on this document and understand the duties I am responsible to fulfill. As part of my work, I know I have the responsibility and obligation to STOP work with a Stop Work Authority (SWA) if conditions change and/or potential hazards have been identified.

Name/Company	Sign	Date

**SSE(s) on job:** _____**Assigned mentor:** _____

Presenter Signature: _____

Date/Time: _____

My signature below indicates that all conditions and requirements listed above have been verified, met, and reviewed with all affected personnel prior to start of work.

Supervisor Signature: _____

Date/Time: _____

Location of Mustering Point: _____

Wind direction (current): _____

GHD Emergency contact (Name and verified phone number): _____

Supervisor Signature documenting Daily Debrief has been completed: _____



Job Safety Analysis (JSA)

Insert Name : Environmental- Monitoring
Well Sampling

Field staff must review job specific work plan and coordinate with project manager to verify that all up front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each workday. **Stop, Think, Act, Review (STAR)** must be used prior to any activity. All personnel must possess the appropriate training prior to initiating scheduled tasks. Also consider weather conditions. GHD personnel have the authority and responsibility to use **Stop Work Authority (SWA)**. Review this JHA initially and in the field prior to initiating the job, using the P66 RM "Go Card" to assist in identifying specific site hazards. Document by "dirtying" this JHA.

Date Issued/Revised:	01/20/2022 14:59:27	Client:	Jenesis Development, LLC		
Project Number:	11219347	Created By:	cra\cmbarton	SIM OPS? YES/NO	SSE on site? YES/NO
Project Address:	1130 Niagara Street Buffalo				
Key Equipment:					
Task-specific Training:					

Hard Hat	Gloves (ANSI/EN 388)	Eye Protection	Fall Protection	APR	Vest	PPE Clothing
☐ Type 1 (Top Impact)	☒ Chemical Protective (ie.Nitrile)	☐ ANSI/CSA Safety Glasses	☐ Harness	☐ Full Face Mask	☐ Class II (standard)	☐ Coveralls
☐ Type 2 (Side Impact)	☐ Level 1 - Light Duty	☐ Goggles/Spoggles	☐ Shock Absorbing Lanyard	☐ Half Face Mask	☐ Class III (Night or Highway Traffic)	☐ Fire Retardent Clothing (FRC)
☐ Class E (standard)	☐ Level 2 - Light Duty with Protection	☐ Face Shields	☐ Lifeline		☐ Anti-Static	☐ High Viz Clothing
☐ Class G	☐ Level 3 - Medium Duty	☐ Other*		Cartridges	☐ FRC	☐ Long Pants
	☐ Level 4 - Heavy Duty			☐ N95	☐ PFD	☐ Long Sleeve Shirts
Foot Protection	☐ High Viz	Hearing Protection	Arc Flash/Shock Protection	☐ P100		☐ Paper Tyvek (disposable)
☐ Industrial Grade Safety Boot	☐ Other*	☐ NOT Required for this task	☐ Hazard Category 2	☐ P95		☐ Polyethylene Tyvek
☐ Rubber Boots (industrial grade)		☐ Required	☐ Hazard Category 4	☐ R95		☐ Other*
☐ Hip Waders				☐ Organic Vapour		
	* see key equipment			☐ Speciality*		

Project Development Team		Modified by	Reviewed by	Date
Name	Signature			
Katherine (kathy) Galanti				

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible (Print first and last names)
1	Coordinate site access	Delays or added work	- Notify Station Manager of schedule - Notify other required personnel if applicable (city, regulators, private property owners, etc.)	
2	Mobilize with proper equipment/ supplies for sampling	- Delay or improper/unsafe performance of work due to improper equipment on site - Cross contamination of wells	- Review work plan to determine equipment/supply needs - Make sure all sampling/gauging equipment is decontaminated - Bring ice for sample storage - Review THE HASP and gather necessary PPE	
3	Notify other personnel on site	- Unknown traffic or other work hazards - Lack of communication between all interested parties	Meet with station attendant or other site personnel and explain planned activities	
4	Determine sampling order	Cross contamination of samples and wells due to incomplete decontamination of sampling equipment	Review prior analytical results and set sampling order from lowest to highest concentration wells	
5	Perform STAR and tailgate safety meeting upon arrival at site	Consider worst case scenario (including weather conditions)	- Review HASP with co workers - Highlight aspects identified by HASP and, if necessary, add to HASP - Get signature of all co workers on HASP	
6	Set up exclusion zone(s)	- Injury or exposure to public or other on site personnel - Slip/trip/fall hazards	- Implement exclusion zone setup instructions of THE HASP (barricades, caution tape, cones, etc.) - Set up work area free of trip hazards	
7	Gauge water levels and product thickness (where applicable) in wells	- Back strain - Inhalation or dermal exposure to chemical hazards	- Don any additional PPE and initiate air quality monitoring in accordance with the HASP - Maintain safe distance from well head - Bend at knees, not waist	

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible (Print first and last names)
8	Purge well(s) and collect purge water	• Cross contamination • Lifting hazards • Back injury • Manual material handling • Inhalation or dermal exposure to chemicals • Slip/trip/fall hazards • Spilling contaminated water	• Decontaminate purging equipment between each sampling location • Reduce travel distance when there is a need to carry/lift materials • Make sure grip is adequate; wear leather/cotton gloves • Size up the load; if the object is too large or odd shaped OR is in excess of 50 pounds (23 kg) then assistance (mechanical or a buddy lift) will be required • Lift with the legs (bend at the knees and use the leg muscles) to protect the lower back and keep lower back in a neutral position • Avoid one handed carrying if possible; maintain awareness of footing • Use PPE and monitoring in accordance with the HASP • Keep work area clear of tripping or slipping hazards • Store purge water in appropriate containers	
9	Collect samples in accordance with sampling plan	• Cross contamination • Lifting hazards • Back injury • Manual material handling • Inhalation or dermal exposure to chemical hazards • Slip/trip/fall hazards • Improper labeling or storage • Injury due to acid burn (unsealed or leaking sample bottle) • Injury from broken sample bottle (cuts or acid burn)	• Use PPE in accordance with the HASP • Use PPE whenever handling or labeling samples • Decontaminate sampling equipment between each well (unless disposable) • Refer to step 9 and the HASP for additional lifting methods • Label samples in accordance with sampling plan • Keep samples stored in proper containers, at correct temperature, and away from work area • Wear nitrile gloves when handling bottles • Handle bottles carefully	
10	Dispose or store purge water onsite	• Lifting hazards • Back injury • Manual material handling • Exposure to chemicals • If disposing through on site treatment system, damage or injury from improper use of equipment • Improper storage or disposal	• Use proper equipment to transport water (pumps, drum dollies, etc.) • Refer to step 9 and the HASP for additional lifting methods • Where PPE in accordance with the HASP • Review any necessary instructions for use of on site treatment systems • Label storage containers properly and locate in isolated area away from traffic and other site functions • Coordinate off site disposal (where applicable)	
11	Clean site/demobilize	• Traffic • Nuisance or safety hazard left on site • Back strain	• Use buddy system as necessary to remove traffic control • Leave site clean of refuse and debris • Notify station personnel of departure, and note any purge water left on site • Exercise caution when lifting coolers out of the trunk of a car; use the buddy system if justified	

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible (Print first and last names)
12	Package and deliver samples to lab	• Bottle breakage • Improper temperature • Exceeding hold times • Improper completion of Chain of Custody (COC)	• Pack samples in ice, use bubble wrap/bags for sample bottles • Use standard COC forms and labels • Submit samples to lab as soon as possible (no more than 3 days, but check sampling plan for any special requirements such as rush turnaround or special hold time restrictions)	

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3. Aligning with the Job Steps, Task Activity Description, and Potential Hazard columns, describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "be careful" or "use as appropriate".

Site Personnel Participating in JSA Review:

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Name/Company	Sign	Date

**SSE(s) on job:** _____**Assigned mentor:** _____

Presenter Signature: _____

Date/Time: _____

My signature below indicates that all conditions and requirements listed above have been verified, met, and reviewed with all affected personnel prior to start of work.

Supervisor Signature: _____

Date/Time: _____

Location of Mustering Point: _____

Wind direction (current): _____

GHD Emergency contact (Name and verified phone number): _____

Supervisor Signature documenting Daily Debrief has been completed: _____



Job Safety Analysis (JSA)

Insert Name : Environmental-Oversight of
Monitoring Well Installation
and/or Soil Boring

Field staff must review job specific work plan and coordinate with project manager to verify that all up front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each workday. **Stop, Think, Act, Review (STAR)** must be used prior to any activity. All personnel must possess the appropriate training prior to initiating scheduled tasks. Also consider weather conditions. GHD personnel have the authority and responsibility to use **Stop Work Authority (SWA)**. Review this JHA initially and in the field prior to initiating the job, using the P66 RM "Go Card" to assist in identifying specific site hazards. Document by "dirtying" this JHA.

Date Issued/Revised:	01/20/2022 14:59:28	Client:	Jenesis Development, LLC		
Project Number:	11219347	Created By:	cra\cmbarton	SIM OPS? YES/NO	SSE on site? YES/NO
Project Address:	1130 Niagara Street Buffalo				
Key Equipment:	Air monitoring equipment; safety cones/fencing/barricades (not needed in vacant, fenced areas)				
Task-specific Training:					

Hard Hat	Gloves (ANSI/EN 388)	Eye Protection	Fall Protection	APR	Vest	PPE Clothing
☐ Type 1 (Top Impact)	☐ Chemical Protective (ie.Nitrile)	☒ ANSI/CSA Safety Glasses	☐ Harness	☐ Full Face Mask	☒ Class II (standard)	☐ Coveralls
☐ Type 2 (Side Impact)	☒ Level 1 - Light Duty	☐ Goggles/Spoggles	☐ Shock Absorbing Lanyard	☐ Half Face Mask	☐ Class III (Night or Highway Traffic)	☐ Fire Retardent Clothing (FRC)
☒ Class E (standard)	☐ Level 2 - Light Duty with Protection	☐ Face Shields	☐ Lifeline		☐ Anti-Static	☐ High Viz Clothing
☐ Class G	☐ Level 3 - Medium Duty	☐ Other*		Cartridges	☐ FRC	☐ Long Pants
	☐ Level 4 - Heavy Duty			☐ N95	☐ PFD	☐ Long Sleeve Shirts
Foot Protection	☐ High Viz	Hearing Protection	Arc Flash/Shock Protection	☐ P100		☐ Paper Tyvek (disposable)
☒ Industrial Grade Safety Boot	☐ Other*	☐ NOT Required for this task	☐ Hazard Category 2	☐ P95		☐ Polyethylene Tyvek
☐ Rubber Boots (industrial grade)		☒ Required	☐ Hazard Category 4	☐ R95		☐ Other*

Hard Hat	Gloves (ANSI/EN 388)	Eye Protection	Fall Protection	APR	Vest	PPE Clothing
☐ Hip Waders				☐ Organic Vapour		
	* see key equipment			☐ Speciality*		

Project Development Team		Modified by	Reviewed by	Date
Name	Signature			
Katherine (kathy) Galanti				

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible (Print first and last names)
1	Markout underground utilities	- Property damage - Explosion - Electrocution - Injury - Death	- Call public underground utility agency (One Call) at least 5 or more days prior to work activities - Review State Law pertaining to underground pipe line safety and have private utility mark out performed - Expose lines if warranted (i.e., hand dig, test pit, or daylight)	Project Manager and Site Supervisor
2	Conduct site walk, identify unsafe conditions and determine sample point locations	- Traffic hazard - Slip/trip/fall hazards - Biological hazard - Overhead/underground hazards - Property damage	- Maintain awareness of on site traffic and walking surfaces - When selecting soil boring locations, be aware of biological hazards (e.g., ants, poison ivy, wasps) and overhead/underground hazards (e.g., overhead utilities, concrete scarring, station canopy) - Use a walking stick, probe, or other such device to check for soil integrity/softness	Site Personnel
3	Equipment inspection	- Pinch points - Property damage - Lost time due to damaged equipment/parts	- Discuss pinch points on equipment (e.g., drill rig, air knife, pressure washer, etc.) - Familiarize all personnel with location/operation of fire extinguisher(s) and kill switch on drill rig - Visually inspect equipment/parts for damage and document inspections	Site Personnel
4	Set up work zone for drilling	- Traffic hazard - Slip/trip/fall hazards - Property damage - Overhead hazards - Environmental impact - Unstable ground conditions - Property damage	- Maintain awareness of on site traffic, work zones, walking surfaces, overhead hazards (e.g., canopy and low hanging overhead lines) - Utilize barricades/cones/caution tape to define work zone and direct traffic - Wear leather/cotton when setting up barricades - Be aware of any potential sensitive receptors and verify all personnel are aware of the location of spill kit - Inspect soil for loose, soft or unstable conditions under rig jacks or outriggers - Place mats or plywood in areas where drill rig will make ruts or depressions (i.e., under tracks or outriggers)	Site Personnel

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible (Print first and last names)
5	Set up staging area	• Traffic hazard • Slip/trip/fall hazards • Lifting hazards • Back injury • Manual material handling • Pinch points • Heat/cold stress	• Maintain awareness of on site traffic and walking surfaces • Utilize barricades/cones/caution tape to define work zone and direct traffic • Reduce distance needed to travel when carrying materials and or equipment • Wear leather/cotton gloves when setting up barricades • Size up the load, If the object is too large or odd shaped OR is in excess of 50 pounds (23 kg) then assistance (mechanical or a buddy lift) will be required. • Lift with the legs (bend at the knees and use the leg muscles) to protect the lower back and keep lower back in a neutral position • Avoid one handed carrying if possible; maintain awareness of footing • Avoid placing hands/fingers in pinch point locations • In extreme temperatures, ensure all personnel have proper clothing, hydration, and heat/cold protection (e.g., canopy, fan, glove warmers)	Site Personnel
6	Contractor oversight/ management of hole clearance/drilling activities	• Traffic hazard • Slip/trip/fall hazards • Lifting hazards • Back injury • Manual material handling • Damage to underground utilities • Contaminant exposure • Heat/cold stress • Injury to personnel and public • Cross contamination • Equipment failure	• Maintain awareness of on site traffic and practice good housekeeping • Perform a prestart meeting, inform subcontractor of safe lifting practices • Refer to step 5 and the HASP for additional lifting information • Ensure subcontractors don proper PPE (e.g., face shield, leather/cotton gloves, hearing protection). No loose clothing. • Complete and sign off utility clearance. If non native material (e.g., pea gravel, sand, fill material) or underground utilities are observed, utilize SWA and assess situation. • Monitor breathing zone and refer to HASP for action levels • Monitor all personnel for signs and symptoms of heat/cold stress and refer to HASP for recommendations • Be aware of unsafe hoisting and material handling practices • Be aware of proper augering and auger handling techniques. Visually monitor performance and functioning of drill rig for signs of failure. Monitor safe drill movement/positional setup. • Decontaminate sampling equipment after collecting a sample and decontaminate drilling equipment after each borehole • Watch where you step, look for debris which may be covered by brush or rubble	Site Personnel

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible (Print first and last names)
7	Construct well	• Lifting hazards • Back injury • Manual material handling • Cross contamination • Non approved construction • Slip, trip, and fall hazards • Eye injury • Cuts	• Use proper lifting techniques as discussed in Step 5 and HASP • Prior to going into the borehole, inspect casing and other materials to ensure they are free of jagged/sharp edges • Confirm construction with project manager • Ensure presence or other authorization by any required inspectors for well installation/grouting • Keep pathways and work area clean of debris and possible tripping hazards • Use PPE and monitoring in accordance with the JSA • Use safe cutting tools (no fixed open blade knives)	
8	Site/boring security, clean site, demobilize	• Traffic hazard • Slip/trip/fall hazards • Lifting hazards • Back safety • Manual material handling	• Use buddy system as necessary to remove traffic control • Do not work with your back to traffic • Wear leather/cotton gloves when moving barricades • Maintain awareness of on site traffic and walking surfaces • Maintain proper lifting techniques as described in Step 5 and HASP. • Ensure good house keeping methods are practiced. Work area is kept clean of debris. • Leave site clean of refuse and debris • Clearly mark/barricade any borings that need later topping off or curing • Notify property personnel of departure • Secure boring location if open overnight	

1. Each Job or Task consists of a set of steps. Be sure to list all the steps in the sequence that they are performed. Specify the equipment or other details to set the basis for the potential (associated) hazards.
2. A hazard is a potential danger. What can go wrong? How can someone get hurt? Consider, but do not limit, the analysis to: **Contact** - victim is struck by or strikes an object; **Caught** - victim is caught on, caught in or caught between objects; **Fall** - victim falls to ground or lower level (includes slips and trips); **Exertion** - excessive strain or stress/ergonomics/lifting techniques; **Exposure** - inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught".
3. Aligning with the Job Steps, Task Activity Description, and Potential Hazard columns, describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "be careful" or "use as appropriate".

Site Personnel Participating in JSA Review:

I have participated in the review and discussion of the Job Safety Analysis (JSA) listed on this document and understand the duties I am responsible to fulfill. As part of my work, I know I have the responsibility and obligation to STOP work with a Stop Work Authority (SWA) if conditions change and/or potential hazards have been identified.

Name/Company	Sign	Date

**SSE(s) on job:** _____**Assigned mentor:** _____

Presenter Signature: _____

Date/Time: _____

My signature below indicates that all conditions and requirements listed above have been verified, met, and reviewed with all affected personnel prior to start of work.

Supervisor Signature: _____

Date/Time: _____

Location of Mustering Point: _____

Wind direction (current): _____

GHD Emergency contact (Name and verified phone number): _____

Supervisor Signature documenting Daily Debrief has been completed: _____



Job Safety Analysis (JSA)

Insert Name : Motor Vehicle - Driving

Field staff must review job specific work plan and coordinate with project manager to verify that all up front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each workday. **Stop, Think, Act, Review (STAR)** must be used prior to any activity. All personnel must possess the appropriate training prior to initiating scheduled tasks. Also consider weather conditions. GHD personnel have the authority and responsibility to use **Stop Work Authority (SWA)**. Review this JHA initially and in the field prior to initiating the job, using the P66 RM "Go Card" to assist in identifying specific site hazards. Document by "dirtying" this JHA.

Date Issued/Revised:	01/20/2022 16:24:19	Client:	Jenesis Development, LLC		
Project Number:	11219347	Created By:	cra\cmbarton	SIM OPS? YES/NO	SSE on site? YES/NO
Project Address:	1130 Niagara Street Buffalo				
Key Equipment:	Vehicle, valid driver's license, 360-degree topper; seatbelt				
Task-specific Training:	Defensive Driving				

Hard Hat	Gloves (ANSI/EN 388)	Eye Protection	Fall Protection	APR	Vest	PPE Clothing
☐ Type 1 (Top Impact)	☐ Chemical Protective (ie.Nitrile)	☐ ANSI/CSA Safety Glasses	☐ Harness	☐ Full Face Mask	☐ Class II (standard)	☐ Coveralls
☐ Type 2 (Side Impact)	☐ Level 1 - Light Duty	☐ Goggles/Spoggles	☐ Shock Absorbing Lanyard	☐ Half Face Mask	☐ Class III (Night or Highway Traffic)	☐ Fire Retardent Clothing (FRC)
☐ Class E (standard)	☐ Level 2 - Light Duty with Protection	☐ Face Shields	☐ Lifeline		☐ Anti-Static	☐ High Viz Clothing
☐ Class G	☐ Level 3 - Medium Duty	☐ Other*		Cartridges	☐ FRC	☐ Long Pants
	☐ Level 4 - Heavy Duty			☐ N95	☐ PFD	☐ Long Sleeve Shirts
Foot Protection	☐ High Viz	Hearing Protection	Arc Flash/Shock Protection	☐ P100		☐ Paper Tyvek (disposable)
☐ Industrial Grade Safety Boot	☐ Other*	☐ NOT Required for this task	☐ Hazard Category 2	☐ P95		☐ Polyethylene Tyvek
☐ Rubber Boots (industrial grade)		☐ Required	☐ Hazard Category 4	☐ R95		☐ Other*

Hard Hat	Gloves (ANSI/EN 388)	Eye Protection	Fall Protection	APR	Vest	PPE Clothing
☐ Hip Waders				☐ Organic Vapour		
	* see key equipment			☐ Speciality*		

Project Development Team		Modified by	Reviewed by	Date
Name	Signature			
Katherine (kathy) Galanti				

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible (Print first and last names)
1	Discuss STAR and SWA	Site personnel not aware of STAR and SWA	• Project team (GHD) discusses importance of and documentation procedures for SWA during pre-job safety meeting • Discuss route, concerns, and alternate routes with passenger and drivers of other vehicles • Use SWA to stop any work that is unsafe • Ensure proper vehicle selected for travel (use a truck if going to construction site or area with rough conditions that would damage a small vehicle?)	Driver and passenger
2	Check weather	• Unexpected storm • Fog; rain; snow; lightning/thunder • Heat/cold stress	• Check local weather forecast • Discuss weather issues and precautions to take while driving and on site during the pre-job safety meeting • If weather conditions (e.g., fog, rain, snow, etc.) impair the ability/vision of the driver, exit at nearest safe location and assess the situation • While on site, at first sign of lightning/thunder utilize SWA and assess weather conditions • In extreme temperatures, ensure all personnel have proper clothing, hydration, and heat/cold protection (e.g., canopy, fan, glove warmers)	Driver or Passenger

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible (Print first and last names)
3	Complete GHD Daily Operator Vehicle Checklist	• Damaged vehicle lights, tires, windows, mirrors, horn • Inadequate vehicle documents and/or safety items	• Check for fluid leaks under vehicle • Test operation of headlights, front/rear turn signals, backup lights, brake lights, and emergency flashers • Visually check the pressure/wear of tires • Ensure the vehicle has a properly inflated spare tire and associated tools to install • Assure windshield and window glass is clean and free from obstructions • Assure all fluids are topped off (e.g., windshield wiper fluid) and scheduled routine maintenance has occurred (e.g., oil changes). • Test the windshield wipers and horn • Verify vehicle registration, insurance card, and inspection sticker is present and valid • If the vehicle contains a first aid kit, fire extinguisher, and road hazard kit, verify that all items with expiration dates are current and that fire extinguisher has had documented monthly check • Do not use vehicle if any safety device is found not functioning	Driver or Passenger
4	Check and adjust seat, steering wheel, headrest, and mirrors	• Back/body strain • Blind spot • Impaired vision	• Adjust seat, headrest, and steering wheel height so body is fully supported/comfortable and pedals are within easy reach • Ensure mirrors are properly adjusted	Driver or Passenger
5	Fasten seat belt(s) and ensure passengers' seat belts are fastened	• Serious injury, ejection, or death from collision and/or traffic citation	Verify driver and passenger(s) seat belts are in good condition and properly latched	Driver or Passenger

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible (Print first and last names)
6	Ensure vehicle doors are locked	• Serious injury, ejection, or death from collision • Unwanted intrusion • Lost equipment	Manually lock all doors to vehicle prior to starting the vehicle	Driver
7	Start engine and check gauges and warning lights	• Vehicle breakdown	Verify sufficient fuel and other hazard lamps (e.g., battery, oil, and temperature) are not lit	Driver
8	Driving – Use defensive driving techniques and stay alert	• Arriving late • Collision • Blind spots of other vehicles • Injury or death to occupants or other parties	• Acknowledge and comply with all traffic regulations, laws, and ordinances • Do not use two-way communicating devices or perform other distracting activities while vehicle is in motion • Constantly scan intersections, move eyes, check mirrors, and assess traffic lights (fresh vs. stale) • Recognize other vehicle's blind spots and minimize time spent within these zones • Maintain safety cushion around vehicle (front, sides, and rear) and 4-second following distance (add an extra second for each hazardous condition, triple following distance in poor weather conditions) • Signal well in advance before changing lanes or turning • Utilize all driving defensive techniques	Driver
9	Arrive at site	• Pedestrian injury • Collision	• Maintain awareness of pedestrian/vehicular traffic when entering site and traveling to work zone	Driver

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible (Print first and last names)
10	Park vehicle – assign a spotter if necessary (when in doubt use a spotter)	● Pedestrian injury ● Collision ● Property damage ● Equipment theft	● Maintain awareness of pedestrian/vehicular traffic ● Park vehicle in pull-through parking space or facing the exit ● Parking in a parking space that is not a designated parking space will require the placement of the 360-degree topper on the hood of the vehicle ● Use a spotter when backing up a vehicle ● If no spotter available when backing up a vehicle, complete a 360-degree walk around vehicle. Ensure there are no hidden obstacles (e.g. pot holes, rocks, stumps, broken tree branches hidden by vegetation/foilage, etc.) that could be struck – look up and down. Stop, park and exit vehicle to check rear clearance as necessary when backing up to ensure travel pathway remains clear ● Use caution and mirrors/spotter when backing vehicle ● Set parking brake ● Never leave field equipment in a vehicle unprotected ● Never miss use and always care for all field equipment ● Never leave expensive equipment in your vehicle overnight ● Always take expensive equipment with you into your hotel room/ house ● Never miss use and always care for all field equipment	Driver
11	Demobilization – conduct a vehicle walk around inspection paying particular attention to path(s) of travel	● Collision ● Injury or death to occupants or other parties	● Perform perimeter vehicle check ● Maintain awareness of pedestrian/vehicular traffic when exiting site ● Utilize defensive driving techniques ● Complete post-departure checklist and report vehicle problems to company vehicle maintenance manager or rental car agency	Driver or Passenger

Job steps ⁽¹⁾	Task activity	Potential hazard(s) ⁽²⁾	Corrective measure(s) ⁽³⁾	Person responsible (Print first and last names)
12	Report maintenance or mechanical problems upon returning vehicle	Conditions worsen leading to mechanical failure resulting in collision and injury	- Report vehicle problems immediately to company representative or rental car agency - Schedule and/or perform repairs as soon as possible	Driver

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- Aligning with the Job Steps, Task Activity Description, and Potential Hazard columns, describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "be careful" or "use as appropriate".

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Name/Company	Sign	Date

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Presenter Signature: _____

Date/Time: _____

My signature below indicates that all conditions and requirements listed above have been verified, met, and reviewed with all affected personnel prior to start of work.

Supervisor Signature: _____

Date/Time: _____

Location of Mustering Point: _____

Wind direction (current): _____

GHD Emergency contact (Name and verified phone number): _____

Supervisor Signature documenting Daily Debrief has been completed: _____

SAFETY DATA SHEET

Version 5.5

Revision Date 03/31/2016

Print Date 11/14/2016

1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Alconox® detergent

Product Number : 242985

Brand : Aldrich

Product Use : For laboratory research purposes.

Supplier : Sigma-Aldrich Canada Co.
2149 Winston Park Drive
OAKVILLE ON L6H 6J8
CANADA

Manufacturer : Sigma-Aldrich Corporation
3050 Spruce St.
St. Louis, Missouri 63103
USA

Telephone : +1 9058299500

Fax : +1 9058299292

Emergency Phone # (For both supplier and manufacturer) : +1-703-527-3887 (CHEMTREC)

Preparation Information : Sigma-Aldrich Corporation
Product Safety - Americas Region
1-800-521-8956

2. HAZARDS IDENTIFICATION

Emergency Overview

WHMIS Classification

D1B	Toxic Material Causing Immediate and Serious Toxic Effects	Toxic by ingestion
D2B	Toxic Material Causing Other Toxic Effects	Moderate skin irritant Severe eye irritant

GHS Classification

Acute toxicity, Oral (Category 4)
Skin corrosion/irritation (Category 2)
Serious eye damage/eye irritation (Category 1)
Acute aquatic toxicity (Category 2)

GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

Hazard statement(s)

H302	Harmful if swallowed.
H315	Causes skin irritation.
H318	Causes serious eye damage.
H401	Toxic to aquatic life.

Precautionary statement(s)

P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P273	Avoid release to the environment.
P280	Wear protective gloves/ eye protection/ face protection.
P301 + P312 + P330	IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth.
P302 + P352	IF ON SKIN: Wash with plenty of water.

P305 + P351 + P338 +
P310
P332 + P313
P362 + P364
P501

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor.
If skin irritation occurs: Get medical advice/ attention.
Take off contaminated clothing and wash it before reuse.
Dispose of contents/ container to an approved waste disposal plant.

HMIS Classification

Health hazard: 2
Flammability: 0
Physical hazards: 0

Potential Health Effects

Inhalation May be harmful if inhaled. Causes respiratory tract irritation.
Skin May be harmful if absorbed through skin. Causes skin irritation.
Eyes Causes eye irritation.
Ingestion Toxic if swallowed.

3. COMPOSITION/INFORMATION ON INGREDIENTS

CAS-No.	EC-No.	Index-No.	Concentration
Tetrasodium pyrophosphate			
7722-88-5	231-767-1	-	>= 10 . <= 30 %
Sodium dodecylbenzenesulfonate			
25155-30-0	246-680-4	-	>= 10 . <= 30 %
Sodium carbonate			
497-19-8	207-838-8	011-005-00-2	>= 7 . <= 13 %
Pentasodium triphosphate			
7758-29-4	231-838-7	-	>= 10 . <= 30 %

4. FIRST AID MEASURES

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed

Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

5. FIREFIGHTING MEASURES

Suitable extinguishing media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Special protective equipment for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

Hazardous combustion products

Explosion data - sensitivity to mechanical impact

No data available

Explosion data - sensitivity to static discharge

No data available

6. ACCIDENTAL RELEASE MEASURES

Personal precautions

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.

Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

Methods and materials for containment and cleaning up

Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

7. HANDLING AND STORAGE**Precautions for safe handling**

Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Provide appropriate exhaust ventilation at places where dust is formed.

Conditions for safe storage

Keep container tightly closed in a dry and well-ventilated place.

Keep in a dry place.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION**Components with workplace control parameters**

Components	CAS-No.	Value	Control parameters	Basis
Tetrasodium pyrophosphate	7722-88-5	TWA	5.000000 mg/m3	Canada. British Columbia OEL
		TWAEV	5.000000 mg/m3	Canada. Ontario OELs
		TWA	5.000000 mg/m3	Canada. Alberta, Occupational Health and Safety Code (table 2: OEL)
Remarks	Occupational exposure limit is based on irritation effects and its adjustment to compensate for unusual work schedules is not required			
		TWAEV	5.000000 mg/m3	Québec. Regulation respecting occupational health and safety, Schedule 1, Part 1: Permissible exposure values for airborne contaminants
		TWA	5.000000 mg/m3	Ontario Table of Occupational Exposure Limits made under the Occupational Health and Safety Act.
		TWA	5 mg/m3	Ontario Table of Occupational Exposure Limits made under the Occupational Health and Safety Act.

Personal protective equipment**Respiratory protection**

Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Hand protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Eye protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin and body protection

Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Hygiene measures

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Specific engineering controls

Use mechanical exhaust or laboratory fumehood to avoid exposure.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form	granular, powder
Colour	white

Safety data

pH	9.5 at 10 g/l
Melting point/freezing point	No data available
Boiling point	No data available
Flash point	No data available
Ignition temperature	No data available
Auto-ignition temperature	No data available
Lower explosion limit	No data available
Upper explosion limit	No data available
Vapour pressure	No data available
Density	No data available
Water solubility	soluble
Partition coefficient: n-octanol/water	No data available
Relative vapour density	No data available
Odour	odourless
Odour Threshold	No data available
Evaporation rate	No data available

10. STABILITY AND REACTIVITY

Chemical stability

Stable under recommended storage conditions.

Possibility of hazardous reactions

No data available

Conditions to avoid

No data available

Materials to avoid

No data available

Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Carbon oxides, Sulphur oxides, Oxides of phosphorus, Sodium oxides

Other decomposition products - No data available

11. TOXICOLOGICAL INFORMATION

Acute toxicity

Oral LD50

No data available

Inhalation LC50

No data available

Dermal LD50

No data available

Other information on acute toxicity

No data available

Skin corrosion/irritation

No data available

Serious eye damage/eye irritation

Eyes: No data available

Respiratory or skin sensitisation

No data available

Germ cell mutagenicity

No data available

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

Reproductive toxicity

No data available

Teratogenicity

No data available

Specific target organ toxicity - single exposure (Globally Harmonized System)

No data available

Specific target organ toxicity - repeated exposure (Globally Harmonized System)

No data available

Aspiration hazard

No data available

Potential health effects**Inhalation**

May be harmful if inhaled. Causes respiratory tract irritation.

Ingestion

Toxic if swallowed.

Skin

May be harmful if absorbed through skin. Causes skin irritation.

Eyes

Causes eye irritation.

Signs and Symptoms of Exposure

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Synergistic effects

No data available

Additional Information

RTECS: Not available

12. ECOLOGICAL INFORMATION**Toxicity**

No data available

Persistence and degradability

No data available

Bioaccumulative potential

No data available

Mobility in soil

No data available

PBT and vPvB assessment

No data available

Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Toxic to aquatic life.

13. DISPOSAL CONSIDERATIONS**Product**

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION**DOT (US)**

Not dangerous goods

IMDG

Not dangerous goods

IATA

Not dangerous goods

15. REGULATORY INFORMATION**WHMIS Classification**

D1B

Toxic Material Causing Immediate and Serious
Toxic Effects

Toxic by ingestion

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

16. OTHER INFORMATION

Text of H-code(s) and R-phrase(s) mentioned in Section 3

Further information

Copyright 2016 Sigma-Aldrich Co. LLC. License granted to make unlimited paper copies for internal use only. The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.



Records of Training

Date: _____ Project Name: _____ Project Number: _____

Project Location: _____

Project Description _____

The Project Manager is ultimately responsible for the accuracy of the information on this Record of Training and ensuring GHD Employees and Subcontractors are familiar with the site and have the required training to do the task

Employee's Name:	Confined Space Entry	Excavation Safety	Fall Protection	GHS (HazCom/WHMIS)	Lock Out Tag Out (LOTO)	Motor Vehicle Safety	Aerial Lift	Other -	Other -	Other -	Other -	
	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
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**COMMUNITY AIR MONITORING PLAN
FOR THE 1130 NIGARA STREET SITE – BUFFALO, NEW YORK
DEVELOPED IN ACCORDANCE WITH THE NEW YORK STATE DEPARTMENT OF
HEALTH'S GENERIC COMMUNITY AIR MONITORING PLAN**

Overview

This site-specific Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of intrusive work activities. The action levels specified herein require increased monitoring and corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP will help to confirm that work activities do not spread contamination off site through the air.

Designated air monitoring station locations will be established around the perimeter of the site for use as monitoring locations. The site-specific CAMP presented below will be implemented during ground intrusive activities at the site. Each day that this activity is in progress upwind and downwind air monitoring stations will be set up to collect data. The instruments that will be used to collect the air monitoring data will have data logging capabilities. The data will be downloaded periodically, stored electronically and will be available to agency personnel for their review.

Reliance on this CAMP should not preclude simple, common sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Real-time air monitoring for VOCs and particulate levels at the perimeter of the site will be necessary, as described below.

Continuous monitoring will be required during all ground intrusive activities at the Site. Ground intrusive activities include the installation of soil borings, monitoring wells, and test trenches.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil sample and groundwater samples. Periodic monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while sample collection and then taking a reading prior to leaving a sample location.

VOC Monitoring, Response Levels, and Actions

VOCs will be monitored at the downwind perimeter of the site on a continuous basis. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The specific type of air monitoring equipment that will be used at the site for VOC monitoring will be a MiniRae 3000, or equivalent. The equipment will be calibrated in accordance with the manufacturer's guidelines. The equipment will be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of VOCs at the downwind perimeter of the site exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.
2. If total organic vapor levels at the downwind perimeter of the site persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the designated work area or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.
3. If the organic vapor level is above 25 ppm at the perimeter of the site, activities must be shutdown.
4. All 15-minute readings must be recorded and be available for State (New York State Department of Environmental Conservation [NYSDEC] and the New York State Department of Health [NYSDOH]) personnel to review. Instantaneous readings, if any, used for decision purposes will also be recorded. In addition, summaries of daily readings will be submitted to NYSDEC and NYSDOH on a daily basis.

Particulate/Fugitive Dust Monitoring, Response Levels, and Actions

Particulate concentrations will be monitored continuously at upwind and downwind monitoring stations on the site perimeter. The particulate monitoring will be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The particulate monitor that will be used will be a TSI 8520 DustTrak, or equivalent. The equipment will be equipped with an audible and/or visible alarm to

indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m³) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the designated work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m³ above the upwind level and provided that no visible dust is migrating from the designated work area.
2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m³ above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m³ of the upwind level and in preventing visible dust migration.
3. All readings must be recorded and be available for State (NYSDEC and NYSDOH) personnel to review. In addition, summaries of daily readings will be downloaded and submitted to NYSDDEC and NYSDOH on a daily basis.

The following fugitive dust suppression and corrective procedures will be employed at the site.

1. Reasonable fugitive dust suppression techniques will be employed during all remedial activities, which may generate fugitive dust.
2. The following techniques are generally effective for the controlling of the generation and migration of dust during construction activities and may be employed as necessary:
 - (a) Applying water on haul roads
 - (b) Wetting equipment and excavation faces
 - (c) Spraying water on buckets during excavation and dumping
 - (d) Hauling materials in properly tarped or watertight containers
 - (e) Restricting vehicle speeds to 10 mph
 - (f) Covering excavated areas and material after excavation activity ceases
 - (g) Reducing the excavation size and/or number of excavations

When techniques involving water application are used, care must be taken not to use excess water, which can result in unacceptably wet conditions. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

